CHAPTER TWELVE

THE DRAFT RISK MANAGEMENT PROTOCOLS

Introduction

12.1 This chapter initially examines the systems approach to quarantine adopted by BA in the draft IRA. A systems approach involves a series of protocols, none of which alone will provide the necessary level of control against a specific pest, but which in combination are designed to provide the level of control required.

12.2 Subsequently, the chapter considers the risk management protocols proposed by BA in the draft IRA to reduce the restricted risk posed by the 11 identified pests of quarantine concern to "very low", in line with Australia's ALOP. In particular, BA proposed a combination of 11 protocols for the management of *Erwinia amylovora*.

12.3 Finally, the chapter also examines a possible alternative to the protocols outlined in the draft IRA, based on a new sampling protocols accepted by US authorities in New Zealand and new DNA tests for the presence of *Erwinia amylovora*.

The Systems Approach to Quarantine adopted in the Draft IRA

12.4 Quarantine protocols are traditionally based on the concept of "area freedom" – freedom of a particular region from a given pest. However, many of the pests associated with New Zealand apples, including *Erwinia amylovora*, are endemic across the country. Accordingly, BA adopted in the draft IRA a so-called "systems approach" to quarantine. [1]

12.5 A systems approach to quarantine integrates a number of different protocols to achieve Australia's ALOP. Such an approach acknowledges that standing on its own, no protocol will provide the necessary level of control against a specific pest, but that in combination, a range of protocols will provide the level of control required.

12.6 In its written submission, PIRSA argued that the systems approach to quarantine is only now gaining acceptance domestically and internationally:

> A major deficiency in this approach however is the inability of quarantine officials to "quantify" the level of control both of the individual procedure and of the "whole". [2]

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1 Biosecurity Australia, Draft Import Risk Analysis on the Importation of Apples from New Zealand, October 2000, pp 111-112. See also submission 39, p 11. See also submission 28, p 7

2 Submission 37, p 6

12.7 In other words, there may debate about the effectiveness of individual components of a systems approach, calling into question the effectiveness of the whole system.

The Draft Risk Management Protocols for *Erwinia Amylovora*

12.8 In the draft IRA, BA proposes 11 protocols to reduce the risk of importation of *Erwinia amylovora* from "high" to "negligible", thereby reducing the probability of entry from "low" to "negligible", and the probability of entry, establishment and spread to "negligible". Accordingly, the restricted risk is reduced to "very low". This is shown in Figure 12.1 below.

Figure 12.1: BA's Restricted Risk Assessment of Erwinia amylovora

Probability of: Entry (P1)	**Establishment (P2)**	**Spread (P3)**	**Probability of entry, establishment and spread (P = P1xP2xP3)**	**Economic Consequence (C)**	**Unrestricted Risk (R=PxC)**
Negligible	High	High	Negligible	Extreme	Very Low

Source: Biosecurity Australia, Draft Import Risk Analysis on the Importation of Apples from New Zealand, October 2000, p 131

12.9 It is important to note from the outset that the protocols target differently apples infected/infested with *Erwinia amylovora*. Significantly, BA specifically acknowledges in the draft IRA that the only 2 protocols aimed at preventing the entry of infested apples are protocol 1 (registered export blocks) and protocol 2 (detection zones).[3]

Protocol 1: Establishment of Registered Export Blocks Free from Fire Blight Disease

12.10 BA cited in the draft IRA research by a range of scientists suggesting that the main source of primary inoculum for the spread of *Erwinia amylovora* in orchards is over-wintering cankers that have developed from infections in previous seasons. In this regard, large cankers on trunks and branches are easily detected and are potentially more important than cankers on twigs, which are more difficult to detect. At the same time, any over-wintering canker that escapes detection is sufficient to provide inoculum to a large area.[4]

12.11 In turn, BA also cited research by a range of scientists (see Chapter Ten) that apples from orchard blocks apparently free from fire blight symptoms and located away from active sources of infection, namely large over-wintering cankers on trunks and branches, are unlikely to be infected/infested with *Erwinia amylovora*.

3 Biosecurity Australia, Draft Import Risk Analysis on the Importation of Apples from New Zealand, October 2000, p 113

4 *Ibid*, pp 113-114

12.12 Accordingly, BA proposed the following measures in an attempt to ensure that symptomless apple fruit are sourced from healthy trees in registered export blocks (REBs) that are surveyed and found free from fire blight:

- MAFNZ would register and maintain a list of all growers eligible to export fruit to Australia and their REBs. Each REB would be physically identified and assigned a unique number for trace-back purposes.
- Only the registered REBs would be permitted to present fruit for export to Australia. The list of REBs would be provided to AQIS, for trace-back purposes.
- In order to establish freedom from fire blight disease in REBs, three inspections per season would need to be carried out on all trees in the REBs, in the season of export and the previous season.
- MAFNZ personnel or their nominated agents, with appropriate skills and experience, would conduct REB inspections.
- Inspection for fire blight symptoms would be undertaken at three stages: full bloom; at fruitlet stage (approximately 2.5cm diameter); and at about two weeks before fruit harvest.
- Inspection for over-wintering cankers would be undertaken at full bloom and/or fruitlet stage.
- Inspections would be carried out by walking down every row and visually examining trees on both sides of each row for symptoms of fire blight disease on blossoms, fruitlets, shoots, branches and trunks. A detailed examination would be required of trees showing any suspicious symptoms.
- Additional inspection would be required (after a pre-harvest inspection) for any block affected by hail or other severe storms that could damage or otherwise predispose fruit to infection.
- If any suspect fire blight symptoms are observed in an REB that could be confirmed by field diagnosis (eg cutting stems), absence of *Erwinia amylovora* would need to be confirmed by an appropriate laboratory test.
- Fruit would be accepted for export to Australia from REBs only if the REBs had been visually inspected (with samples tested, if necessary) and found free from fire blight disease (canker, blossom blight, fruit blight, shoot blight, trauma blight) at all (specified) inspections during the present and previous season.
- If fire blight were confirmed on apple trees in an REB at any of the inspections, that REB would be disqualified from the export program for the current season, and the next season.[5]

5 *Ibid*, pp 116-117

12.13 In response to these measures, the New Zealand Government argued that the requirement for three inspections over a period of two years to demonstrate REBs are free of fire blight is not the least trade restrictive measure available to Australia, and could be achieved by a single orchard inspection.[6]

12.14 By comparison, various other parties argued that visual inspection for cankers could potentially be ineffective, on the basis that:

a) *Erwinia amylovora* can be present without visible symptoms;

b) Over-wintering cankers can be very difficult to see, and can form on twigs as small as 4mm in diameter;

c) The timing of the proposed visual inspections is inappropriate; and

d) Visual inspections are of variable reliability.

12.15 These four arguments are addressed below. In addition, the Committee notes evidence in relation to the protocols under which apples are imported into Japan from New Zealand.

The Presence of *Erwinia amylovora* without Visible Symptoms

12.16 Various parties raised the concern during this inquiry that *Erwinia amylovora* can be present without visible symptoms, effectively defeating visual inspections of REBs. In particular, the AAPGA cited research by Van der Zwet and Van Buskirk (1984), Bonn (1979) and Gowda and Goodman (1970) that *Erwinia amylovora* can be present epiphytically on apparently healthy leaves, buds and stems, without forming cankers. Similarly, Schroth *et al* (1974) also suggests that *Erwinia amylovora* can establish latent colonies within shoots, again without forming cankers.[7]

12.17 This is consistent with BA's own conclusion on page 81 of the draft IRA that 'infestation with *Erwinia amylovora* can occur in the absence of detectable disease and can lead to the contamination of immature and mature apple fruit and trash'. It is also consistent with BA's acknowledgment at page 110 that fire blight is one of the most erratic and unpredictable diseases of apples and pears and 'can develop in orchards with no history of the disease'.[8]

12.18 The Committee notes in this regard evidence from Mr Veens, formerly a grower in the Netherlands, in hearings in Stanthorpe on 12 February 2001. He testified to the Committee that his experience in Holland was that you could have ten

6 Submission 24, p 45

7 Submission 33, p 34. See also for example Evidence, RRAT, 9 March 2001, p 385

8 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 81, 110

years during which fire blight did not manifest itself, but that then it would reappear despite all attempts at control.[9]

The Presence of Cankers as Small as 4mm in Diameter

12.19 In his written submission, Dr Wimalajeewa disputed any suggestion by BA that large cankers on trunks and branches are potentially more important than cankers on twigs. In addition, he noted research by Brookes (1926) and Ritchie and Klos (1975) that *Erwinia amylovora* are often present in cankers formed on twigs as small as 4mm in diameter, and that it is clearly difficult for inspectors to detect such small cankers.[10] The Committee notes similar research by Steiner (2000).[11]

The Timing of Visual Orchard Inspections

12.20 In its written submission, the New Zealand Government argued that the appropriate timing for a visual inspection of orchards is during the blossom (petal fall) or at fruitlet stage, when fire blight symptoms would be expressing themselves in the orchard, rather than the three proposed inspections.[12]

12.21 This position was supported by both PIRSA and Agriculture WA, both of which recommended that the best time to detect fire blight cankers from the previous season is pre-blossom, and that therefore the first inspection would be better timed prior to bud burst. PIRSA also recommended an additional inspection following leaf fall when "flags" from fire blight infected shoots would be easier to observe.[13]

12.22 In addition, various parties raised the fact that the inspections will take place during the previous season and the current export season, despite the acknowledgment in the draft IRA that cankers can remain active for up to four year (see Nachtigall *et al*[14]). Van der Zwet suggests cankers may remain active for up to 6 years.[15]

The Reliability of Visual Inspections

12.23 Agriculture WA suggested in its written submission that MAFNZ would be required to inspect up to 400,000 trees under the terms of protocol one, and suggested

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9 Evidence, RRAT, 12 February 2001, p 56

10 Submission 28, pp 12-13

11 P.W.Steiner, 'The Biology and Epidemiology of Fire Blight', http://www.caf.wvu.edu/kearneysville/articles/FB-BIOLOGY00.html (2000)

12 Submission 24, p 44

13 Submission 37A, p 4

14 M.Nachtigall, W.Ficke & H.J.Schaefer, 'Model Experiments on the Viability of *Erwinia Amylovora*' in Winslow *et al*, Review of Plant Pathology(66, No 2893, 1985).

15 T.van der Zwet, 'Study of Fire Blight Cankers and Associated Bacteria in Pear', *Phytopathology*, (56, 1969)

that it is unlikely that such a large number of trees would be rigorously inspected 3 times a year.[16]

12.24 In this regard, the Committee notes that Clark *et al* (1993) reported that *Erwinia amylovora* was detected on fruit from an orchard that had been visually inspected earlier and found to be free of symptoms. Subsequent inspection revealed a low level of symptoms that had been missed the first time.[17]

12.25 In response to this issue, the Australian Food and Grocery Council recommended in its written submission that the visual inspection of all orchards be supplemented by detailed examination of 10 per cent of trees in the block. [18]

12.26 The AAPGA also raised the possibility that ahead of inspections, orchard managers in New Zealand would cut out cankers that were clearly infected, and spray the orchard with antibiotics or copper sprays, thereby making the detection of disease more difficult, but without actually removing the bacterium.[19]

12.27 This point was also made by a number of other parties such as PIRSA,[20] Mr Stephen Tancred, the principal of Orchard Services,[21] and Mr Ashton from the NSW Farmers' Association.[22]

The Japanese Orchard Protocols

12.28 During the conduct of the inquiry, various parties also referred to the fire blight protocols enforced by other countries, in particular Japan. Japan requires 3 inspections of orchards within one season.[23] In addition, various parties referred to recent withdrawals of New Zealand export blocks from the Japanese export program:

- In 1994/95, there were 449 Designated Export Applications (DEAs), of which 240 were withdrawn from the program (53.4%); and
- In 1995/96, there were 162 DEAs, of which 49 were withdrawn from the program (30.2%).[24]

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16 Submission 52, p 42

17 R.G.Clark, C.N.Hale and D.Harte, 'A DNA Approach to *Erwinia amylovora* Detection in Large Scale Apple Testing and in Epidemiological Studies', *Acta Horticulturae*, (Vol 338, 1993)

18 Submission 38, pp 14-15

19 Submission 33, p 34

20 Submission 37A, p 4

21 Submission 8, p 5

22 See for example evidence, RRAT, 9 March 2001, p 385

23 C.N.Hale, R.K.Taylor, R.G.Clark and T.A.Batchelor, 'Quarantine and Market Access' in W.G.Bonn (ed), *Seventh International Workshop on Fire Blight*, (Acta Horticulturae No 411, International Society of Horticultural Science, 1996), p 63

24 Submission 17, p 12. See also submission 33, appendix 8, p 121. See also NSW Farmers – Batlow Branch, tabled documents, 9 March 2001

12.29 In noting these withdrawals from the Japanese export program, Dr Wimalajeewa raised the possibility that a significant number of fruit that were accepted by Japan nevertheless still carried *Erwinia amylovora*.[25]

12.30 In response, Mr Ivess from MAFNZ indicated that the apple blocks were withdrawn due to the presence of European mites or black scab in the consignments in those years. The New Zealand Industry of its own volition withdrew the export blocks from supply to the Japanese market.[26]

12.31 Mr Ivess further noted that withdrawal of the export blocks was only necessary because Japan does not recognise the 'official control' of these pests in New Zealand. Official control of pests is recognised by all other countries in the WTO.[27]

Protocol 2: Establishment of Detection Zones

12.32 BA noted in the draft IRA that Japan requires a 500m buffer zone around export blocks in New Zealand which contain no fire blight hosts. However, BA cited research by van der Zwet and Keil (1979), Schroth *et al* (1974) and Hoopingarner and Waller (1992) that insects and birds have the potential to carry inoculum large distances. Bees alone regularly fly 4km, and can fly up to 13km. Accordingly, BA argued that buffer zones around REBs would be impractical to prevent the spread of *Erwinia amylovora* by bees or other insects or birds.[28]

12.33 However, BA indicated that a detection zone would be useful in detecting the spread of *Erwinia amylovora* by passive movement, such as rain splash or wind borne water droplets. In this regard, BA cited research that wherever *Erwinia amylovora* has been reported on fruit, a source of inoculum has always been nearby.[29] In particular, Clark *et al* (1993) find that:

> … bacteria were not detected in a large number (c. 60,000) of immature fruit harvested from orchards free from fire blight, separated by a 500 metre zone with no hosts of fire blight symptoms over three growing seasons.[30]

12.34 Accordingly, BA proposed the following measures to monitor for the presence of fire blight symptoms around an REB, thereby decreasing the likelihood of *Erwinia amylovora* being present in the REB:

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25 Submission 28, p 13

26 Meeting between the Committee and officials from MAFNZ and MFATNZ, Wellington, 15 May 2001

27 Meeting between the Committee and officials from MAFNZ and MFATNZ, Wellington, 15 May 2001

28 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, pp 117-118

29 *Ibid*, p 118

30 R.G.Clark, C.N.Hale & D Harte, 'A DNA Approach to *Erwinia Amylovora* Detection in Large Scale Apple Testing and in Epidemiological Studies', *Acta Horticulturae*, (Vol 338, ,1993)

- Each REB would have to be surrounded on all sides by a detection zone 50m deep.
- The detection zone would include at least three rows of apple trees adjacent to the REB.
- Apart from apples, the detection zone would be free from alternative hosts of fire blight including pear.
- The inspection procedures for the detection zone would be the same as for protocol 1.
- Confirmation of fire blight disease symptoms in the 50m detection zone would result in the disqualification of the REB from export of fruit to Australia.[31]

12.35 In response to these measures, various parties argued that a 50m detection zone around REBs, containing no less than three rows of trees, is inadequate to form a trap against the spread of *Erwinia amylovora*.[32]

12.36 NSW Agriculture, PIRSA and the Victorian Department of Natural Resources and Environment all noted that BA cites the finding of Clark and Hale (1993), but that Clark and Hale's research is based on a 500m buffer zone.[33] The Victorian Department of Natural Resources and Environment continued:

> This is not to say that buffer zones of less than 500 meters could not provide a comparable result, but there is no direct scientific evidence (eg field trials) to prove or disprove this.[34]

12.37 Accordingly, it was argued that BA should have adopted a 500m buffer zone. This argument was made by the AAPGA,[35] JA & BM Bowden & Sons Pty Ltd,[36] Environment Australia,[37] Mr Tancred from Orchard Services[38] and the QFVG Apple Committee, amongst others.[39]

12.38 As before, BA highlighted that the detection zones are targeted specifically against the movement of *Erwinia amylovora* by rain splash across short distances. They are not targeted at the spread of *Erwinia amylovora* by bees across long

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31 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, pp 119-120

32 Submission 33, p 35

33 See Submission 40A, p 15, Submission 37A, p 5, Submission 45, p 3

34 Submission 45, p 3

35 Submission 33, p 35

36 Submission 7, p 8

37 Evidence, RRAT, 28 February 2001, p 357

38 See for example submission 8, p 2

39 Submission 10, p 12

distances (4km or more). BA rejected as impractical a buffer zones around REBs to prevent the spread of *Erwinia amylovora* by bees or other insects or birds.

12.39 In this regard, the Committee notes the submission of the Victorian Apiarists' Association and the Crop Pollination Association on behalf of the beekeeping industry in Australia. The associations noted that bees are under most circumstances unlikely to fly more than 500m, and that accordingly a 500m buffer zone would be effective:

> With copious amounts of blossom available to bees during flowering in intensively planted orchards and unfavourable weather conditions usual at this time, honey bees tend to forage within 150-200 metres of their hives….
>
> It is unlikely in spring flowering orchards that bees would travel more than 500m from their hives and therefore the statement on page 117-34 that there is no clear scientific justification for a 500m buffer zone is incorrect.[40]

12.40 The Victorian Department of Natural Resources and Environment also noted in its written submission that the trees in the proposed detection zone are to be treated with antibiotics against *Erwinia amylovora*. Accordingly, they are unlikely to display visible symptoms of the disease, thereby decreasing the effectiveness of the detection zone. To address this, the department recommended that a 25m zone of trees around an REB be left untreated, at least during the blossom period.[41]

12.41 In its response to protocol 2, the New Zealand Government argued in its written submission that there is no justification or rationale for the establishment of detection zones. In particular, it argued that endophytic *Erwinia amylovora* has never been isolated from fruit located more than 15 cm from infection sites, other than by van der Zwet *et al.* (1990). Van der Zwet isolated *E. amylovora* from surface sterilised fruit taken from an orchard free of symptoms but less than 10m from an infected orchard.[42] The New Zealand Government continued:

> It is difficult to understand the justification for a 50m detection zone. Surface contamination of fruit would most likely be caused by short range dispersal from infected trees through rain splash, rather than long distance spread. It has been suggested that the buffer zone serves as a barrier to prevent rain splash being blown into an export block. Presumably this measure is designed to protect the export blocks from becoming infected with fire blight, rather than fruit surfaces being contaminated.[43]

12.42 Similarly, Prof Aldwinckle indicated in evidence on 29 March 2001 his opinion that a 50m detection zone is quite excessive, and that anything more that 10m would not improve the ability of authorities to detect an incursion of *Erwinia*

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40 Submission 12, pp 4-5

41 Submission 45, p 11

42 Submission 24, p 46

43 Submission 24, p 50

amylovora. Prof Aldwinckle continued that the diligence with which the orchard and detection zone is patrolled is more important than increasing the radius of the detection zone.[44]

12.43 By contrast, the Committee notes the evidence of Dr Zoller that the size of the buffer zone is irrelevant, given that you cannot guarantee area freedom in individual orchards in New Zealand. That is to say that *Erwinia amylovora* will inevitably go undetected in some orchards from which apples for export to Australia are sourced.[45]

Protocol 3: Disinfestation of Harvesting Bins

12.44 BA noted in the draft IRA research by Keck *et al* (1996) that *Erwinia amylovora* can survive on both wood and plastic, used in harvesting bins, for at least 3 months.[46] Keck *et al's* research considered the risks of spreading *Erwinia amylovora* with crates, artificially contaminated pieces of wood – beech, poplar and spruce – and plastic kept at 16°C and 4°C in Petri dishes. After three months of storage, living bacteria were recovered from each material.[47]

12.45 Accordingly, BA suggested in the draft IRA that harvest bins, which are not disinfested before use in New Zealand, pose a risk of cross contamination of *Erwinia amylovora* between apples, and proposed the following measures to clean and disinfect harvesting bins:

- Harvesting bins used for fruit destined for Australia must be used solely for that purpose, labelled "For Australia", and kept segregated from ineligible bins.
- To be eligible for use, bins must either be new or they must be disinfested/cleaned. Acceptable cleaning methods are dipping bins in a solution of 100ppm (parts per million) available chlorine for at least one minute, washing with high-pressure water or steam cleaning.
- Any trash remaining in bins between loads should be removed to minimise contamination risk.[48]

12.46 In response to these measures, JA & BM Bowden & Sons noted the finding of the industry technical advisory panel comprising van der Zwet, Wimalajeewa and Pullar. They argued that the proposal for high pressure cleaning 'is not likely to be effective in eliminating *Erwinia amylovora* inoculum'. Similarly, they recommended

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44 Evidence, RRAT, 29 March 2001, p 378

45 Evidence, RRAT, 29 March 2001, p 391

46 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 120

47 M.Keck, H.Reich, R.Chartier & J-P.Paulin, 'First Record of Fire Blight (*Erwinia Amylovora)* in Austria: Preliminary Experiments on the Survival on Fruit Boxes', *Acta Horticulturae*, (No 411, 1996), p 9

48 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, pp 120-121

that the strength of chlorine used should be 200ppm rather than the proposed 100ppm.[49]

12.47 By contrast, the New Zealand Government argued in its written submission that the possibility of fruit surfaces being contaminated (as opposed to say the calyx) is already incredibly small. In addition, it is of no practical value as a result of protocol 4, discussed below.[50]

Protocol 4: Disinfestation of Fruit

12.48 As before, BA cited research in the draft IRA that *Erwinia amylovora* can be present in the calyx and on the surface of fruit harvested from blight-free orchards, and may subsequently act as a source of inoculum.[51] Accordingly, BA proposed the use of a chlorine solution to disinfest fruit:

- Disinfest fruit with 100 ppm available chlorine for one minute in a dump tank in which the pH is maintained at between 5.0-6.5.
- Chlorination with spray rinse is not an acceptable alternative.
- The concentration of chlorine must be monitored and maintained at or above 100 ppm throughout the disinfestation process, to compensate for the reduction in the efficacy of chlorine by organic materials.
- Trash harvested with the fruit to be kept to the practicable minimum.
- MAFNZ would consult with BA prior to use if a suitable alternative to chlorine was found.[52]

12.49 In proposing these measures, BA acknowledged that *Erwinia amylovora* infesting the calyx-end of some fruit may not be killed by chlorine treatment due to the formation of air pockets which protect the bacterium. BA justified this on the basis that apples sourced from REBs free of fire blight symptoms in accordance with strategies 1 and 2 would be unlikely to harbour *Erwinia amylovora* in their calyx.[53]

12.50 In response to these measures, the AAPGA and a range of other parties reiterated BA's acknowledgment that *Erwinia amylovora* in the calyx of the fruit may be protected during washing by air pockets.[54] For instance, Environment Australia noted that an effective and safe method of disinfecting the calyx and removing

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49 Submission 7, p 10

50 Submission 24, p 50

51 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 121

52 *Ibid*, pp 122-123

53 *Ibid*, p 123

54 Submission 33, p 36

Erwinia amylovora has yet to be developed.[55] Similarly, Mr Tancred stated in hearings:

> The calyx end is at the bottom of the apple. On a mature apple, that is where most of the fire blight is—it is inside the calyx. When you dip an apple in fluid, because there is an air bubble inside the core, the fluid does not go up into the middle. It is like an air lock. So the place where most of the disease is—inside the core, just inside the remnant flower parts in the bottom of the apple—is where the dip does not get to.[56]

12.51 In evidence, Prof Aldwinckle agreed that a chlorine bath would certainly kill bacteria cells on the surface of apple fruit, although it is possible that bacteria in the calyx might escape exposure to the chlorine.[57]

12.52 In its response, the New Zealand Government argued that the disinfestation of apple fruit using a chlorine solution is excessive, given that a simple wash in a water dump has been found to be almost as effective.[58] Similarly, the Department of Natural Resources and Environment Victoria noted that treatment of 100ppm available chlorine is far in excess of what is required to kill fungal and bacterial spores and cells.[59]

12.53 BA also noted in the draft IRA that it is possible to disinfest apples through irradiation at 500 Gy combined with radiation sensitising chemicals such as N-ethylmaleimide. This would require BA to apply for approval of irradiation of apple fruit to the Australia New Zealand Food Authority (ANZFA).[60]

12.54 ANZFA made a submission to BA on the draft IRA, subsequently provided to the Committee by BA. ANZFA noted that under the Australian *Food Standard Code*, irradiation of food, including apples, is not permitted in Australia, unless approved for specific products under standard 17A of the code.[61]

12.55 In hearings, Mr Roche from ANZFA informed the Committee that the ANZFA has only received one application for irradiation of food, namely herbs, spices, nuts and teas. This application is currently being considered.[62]

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55 Submission 43, p 9

56 Evidence, RRAT, 12 February 2001, p 37

57 Evidence, RRAT, 29 March 2001, p 376

58 Submission 24, p 51

59 Submission 45, p 14

60 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, pp 122-123

61 BA, Response to Questions on Notice, 13 February 2001

62 Evidence, RRAT, 11 May 2001, p 439, 447

Protocol 5: Sanitation of the Packing Line

12.56 BA noted in the draft IRA that it is possible for disinfested fruit to be reinfested on a packing line previously used for packing fruit harvested from infected/infested orchards. Accordingly, BA proposed:

- The surface of the packing line, which may come into contact with fruit eligible for export to Australia, must be sanitised before packing fruit for Australia.[63]

12.57 In response, the AAPGA raised doubt whether the cleaning of bins, fruit and packing lines using chlorine solution will kill the *Erwinia amylovora* bacterium. For instance, the AAPGA cited the example of grime that builds up on packing lines. It submitted that a wash down in chlorine would kill bacteria on the top layer, but leave bacteria under the surface untouched. As a solution, AAPGA argued that a special packing line for use only for Australia bound apples should be installed.[64]

12.58 In addition, JA & BM Bowden & Sons argued in their written submission that the entire sections of the protocol on packing line and pack house hygiene and sanitation are vague and undefined. That is to say that whilst the protocol stipulates that sanitation must be conducted, it fails to specify how it should be conducted, when it should be conducted, by whom it should be conducted, and so forth.[65]

Protocol 6: Sorting, Grading and Packing Procedures

12.59 BA noted in the draft IRA that damaged or blemished fruit have a higher risk of carrying *Erwinia amylovora* than other fruit. Similarly, fruit contaminated with visible amounts of trash is considered to be at a higher risk of carrying the bacterium. Accordingly, BA proposed that only sound fruit substantially free from blemishes and trash be packed for Australia:

- All packinghouses intending to pack fruit for export to Australia would be registered by MAFNZ and given unique numbers for trace-back purposes.
- The fruit would have to be practically free from plant trash (leaves, stems and all other plant matter) and soil.
- Before storage, fruit would need to be packed in clean, new cartons and labelled in such a way as to enable trace-back to individual REBs.
- If fruit is to be held under controlled atmosphere storage, bins and grading equipment would need to meet the requirements of protocols 3 and 5 above.
- Fruit would need to be handled in a manner so as not to present a risk of cross contamination from or substitution with apples from outside the program.

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63 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 123

64 Submission 33, p 36

65 Submission 7, p 11

- Packinghouses would need to be hygienically maintained.[66]

12.60 In its written submission, the Australian Pome Fruit Improvement Program Ltd highlighted the very stringent quarantine protocols Australia currently enforces for importing budwood. Presently, AQIS requires that plant material entering Australia spend 3 years in quarantine, although BA is currently reviewing this three-year condition to see whether the length of time can be reduced.[67]

12.61 By allowing the importation of New Zealand apples, the Australian Pome Fruit Improvement Program Ltd argued that BA is 'effectively giving approval for the importation of budwood via a pathway that is currently and rightly considered extremely high risk.'[68]

12.62 In response, the New Zealand Government agreed that infected plant material is a potential risk, and accepted that a phytosanitary requirements that fruit is free from trash is a reasonable measure. At the same time, the New Zealand Government did not accept protocol 6 as proposed.[69]

Protocol 7: Phytosanitary Inspection and Certification

12.63 BA proposed in the draft IRA phytosanitary inspection and certification of apples destined for Australia to detect the presence of any quarantine pests in a consignment. Inspection and certification would be conducted by MAFNZ accredited certifying agents:

- All fruit harvested from one REB in one day would constitute an inspection 'lot' unless otherwise agreed by AQIS and MAFNZ.
- MAFNZ accredited certifying agents would inspect randomly 600 pieces of fruit per 'lot'.
- If an inspection 'lot' were rejected, the remaining fruit from that REB would be withdrawn.
- A registered REB from which fruit is rejected would be permitted to submit further 'lots' for the current export season, but if a second 'lot' were rejected the registered REB would be suspended for the remainder of the season.
- MAFNZ accredited certifying agents would ensure that apples are sourced from REBs that have met all phytosanitary requirements and that packinghouse records match details on the cartons.

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66 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 124

67 Evidence, RRAT, 15 February 2001, p 225. See also Submission 41, p 35

68 Submission 18, pp 2-3

69 Submission 24, p 51

- A phytosanitary certificate would need to be issued by MAFNZ for each satisfactory consignment with the following declaration: "Grown, packed and certified in accordance with the 'Arrangements' between AQIS and MAFNZ concerning the access of New Zealand apples to Australia".[70]

12.64 In its written submission, the AAPGA suggested that the above inspection requirements are not sufficiently rigorous. The AAPGA indicated that up to 200 bins of apples can be collected from an REB during a single day, the equivalent of four full semi-trailers or 3,500 to 5,000 cartons. Accordingly, the AAPGA registered its concern that the inspection of 600 apples from a single "lot" (harvested from an REB during a single day) represents between five and seven cartons, or less that 0.15 per cent of the fruit harvested. This raises the possibility that fruit from only one or two trees is inspected, or that cartons packed within a few minutes of each other are inspected. To address this, the AAPGA recommended that:

a) All cartons in a lot be numbered sequentially;

b) An accepted biometric sampling system based on the sequential number system of cartons be used in the inspection;

c) No more than two pieces of fruit be inspected from each carton;

d) That the fruit for inspection be taken from different parts of the carton (that is, not always the top layer); and

e) That all cartons opened be inspected for trash.

12.65 Similar to the AAPGA, JA & BM Bowden & Sons calculated that between 180-200 bins may be harvested from each REB per day, bringing the total size of the "lot" to around 360,000 apples. On this basis, a sample of 600 apples is less than 0.167 per cent of the "lot", and may not reveal the presence of *Erwinia amylovora*.[71]

12.66 In response, BA argued in the draft IRA that it is a common misconception that the chance of detecting infected or infested fruit with a fixed sample of 600 fruit decreases as the consignment size increases. Rather, BA argued that as the consignment size increases, the number of infected fruit in the consignment also increases. The overall result is that there is no loss of confidence in the sampling scheme for detecting pests in large consignments.[72]

12.67 The Committee notes that this argument is not technically correct. The chance of detection must decrease if the number of apples inspected is fixed at 600, but the

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70 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, pp 124, 104-105

71 Submission 7, p 12, see also submission 38, p 20

72 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 105

consignment size increases from say 50,000 to 350,000, assuming the number of infected apples remains a fixed percentage of the consignment.

12.68 Take the following extreme example. Suppose 99 per cent of any consignment was infected. In a consignment of 50,000 apples, this would mean that 49,500 were infected. Accordingly, with only 500 uninfected apples, a sample of 600 could not all be uninfected, meaning the infection would be detected with certainty.

12.69 By contrast, if the consignment was 350,000 apples, 346,500 would be infected and 3,500 would be uninfected. Accordingly, a sample of 600 has a chance (although admittedly negligible) of being all uninfected, meaning that detection is no longer absolutely certain. Hence, there is some loss of confidence as the consignment size is increased.

12.70 That said, the Committee notes that the loss confidence involved when the rate of infection is only 0.1 per cent is so small as not to matter, and must be placed in the context of the far greater uncertainty in other aspects of the import protocols and the science.

12.71 Aside from this issue, various other submissions also commented on the fact that NZ growers have a "second chance" if *Erwinia amylovora* is detected in a lot. It was argued that if *Erwinia amylovora* is detected, no further lots should be accepted from that REB for that season, and the conditions of protocol 1 requiring REB freedom from fire blight symptoms over two seasons should be activated.[73]

12.72 In response to protocol 7, the New Zealand Government argued that phytosanitary inspection would not significantly reduce the risk of infected fruit being exported. Quite simply, the New Zealand Government argued that visual inspection of the fruit would not detect endophytic infection of fruit, negating the effectiveness of phytosanitary inspection and certification. At the same time, however, the New Zealand Government noted that phytosanitary inspection adds significantly to the cost of the export program and is therefore an impediment to trade.[74]

Protocol 8: Registration of Exporters and Packinghouses

12.73 BA proposed in the draft IRA that in order to be assured that fruit is only sourced from REBs, packinghouses and exporters should be registered with MAFNZ:

- All packinghouses and exporters eligible to export apple to Australia would be registered with MAFNZ.
- Packinghouses and exporters would only source fruit from REBs.
- MAFNZ would not to issue phytosanitary certificates to unregistered exporters.

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73 See for example Submission 40A, p 16

74 Submission 24, p 47

- An exporter failing to adhere to the conditions in the program would be deregistered for any offence, however minor, if it constitutes a quarantine risk to Australia (ie allowing a few leaves in one line) or subject to other action/s as appropriate to the circumstances.
- Reinstatement of deregistered exporters would be the responsibility of MAFNZ.
- AQIS would be advised of each deregistration and any subsequent reinstatement.[75]

12.74 In response, the New Zealand Government requested that the requirement that AQIS be notified of all changes in registration of exporters and packinghouses be modified to a requirement for MAFNZ to maintain a register of blocks, exporters and packinghouses which are available to AQIS on request. The New Zealand Government suggested that notification of every change in registration is onerous and costly.[76]

Protocol 9: Maintenance of Fruit Security in Storage

12.75 BA proposed in the draft IRA the following measures to maintain the integrity of lots of fruit placed in storage prior to shipment to Australia:

- Fruit destined for Australia would need to be segregated from fruit for other markets.
- Fruit packed for Australia in pallets or cartons would have to be stored in cold or controlled environments until shipping, with at least 1m separation from other fruit to avoid cross contamination.[77]

12.76 In its written submission, the AAPGA argued that it is possible or even likely that insect activity would continue between apple cartons kept in cool storage. Accordingly, the AAPGA suggested that a 1m buffer between apples in storage destined for Australia and apples destined for another country may not be sufficient, and recommended that openings in cartons be covered with gauze to prevent insect penetration.

12.77 In addition, the AAPGA submitted that the likelihood of cross-contamination is even greater when apples are stored in open bulk bins. The AAPGA recommended that if fruit destined for Australia is stored in bulk bins, then the cool rooms must not contain apples in bins destined for another country.[78]

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75 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 125

76 Submission 24, p 48

77 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, pp 125-126

78 Submission 33, p 38

12.78 In response, the New Zealand Government submitted that the requirement for a 1m separation is not supported by any technical documentation to suggest that *Erwinia amylovora* is capable of spreading 1m in cold storage.[79]

Protocol 10: AQIS Audit of New Zealand Apple Production and Packinghouse Systems

12.79 As above, BA noted in the draft IRA that non-MAFNZ personnel may carry out implementation of many of the above protocols. Accordingly, BA proposed the following measures to ensure that procedures carried out by non-MAFNZ personnel would be done in accordance with BA requirements:

- An arrangement document would be developed between AQIS and MAFNZ setting out the specific operational procedures MAFNZ would implement to ensure all conditions are fully met. All necessary phytosanitary procedures would be documented for approval by AQIS.
- AQIS officers would visit New Zealand during each growing season, at a time that coincides with the fruitlet orchard inspection, to conduct a comprehensive audit of MAFNZ's systems. This audit would include verification of field inspections. Another audit would be conducted at a time determined by AQIS.
- The audits would include a random selection of every component in the system, including REBs, detection zones, laboratory testing, packinghouses and inspection and certification procedures.
- If any breach of conditions specified were detected, MAFNZ would be notified in writing and asked to take appropriate actions to prevent apples from offending growers/packers entering Australia until reinstatement. If significant or repeated cases of non-compliance were detected, imports would be suspended pending review. Offending parties would be excluded before any resumption of imports.
- A sample of REBs would be chosen by AQIS and randomly inspected and relevant records audited by an AQIS officer for compliance.[80]

12.80 In response to these measures, the AAPGA suggested that there are some 'elements' within countries that have fire blight, including New Zealand, that 'would like nothing better than to see fire blight free nations such as Australia, Chile and South Africa plagued with the disease':

> There is no suggestion here that officials from government departments charged with the responsibility to oversee any established protocol would not do so with integrity and diligence. However, it cannot be denied that within any given community of people there will be a "rogue element" willing to take almost any risk to ensure that their goals are achieved – it

79 Submission 24, p 48

80 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 126

> would be foolish to think that New Zealand apple growers are exempt from this observation of the human condition. The same should be said of apple growers in the USA, whose application to export to Australia is pending and, presumably, dependent upon the outcome of the New Zealand application.[81]

12.81 Other parties were less constrained in their comments. For example, JA & BM Bowden & Sons argued that it is irresponsible for BA to place responsibility for the implementation of the proposed protocols in the hands of MAFNZ, 'when New Zealand stands to benefit substantially from [*Erwinia amylovora's*] establishment and destruction of apple orchards in Australia:

> We have no confidence that MAFNZ will uphold the integrity of this, or any other proposed protocol in the light of the fact that Australia has a trade advantage due to its current fire blight free status.[82]

12.82 Similarly, the NSW Farmers' Association noted that New Zealand inspectors would be presented with a conflict of interests, and may overlook symptoms of fire blight in some instances.[83] The Batlow Branch of the NSW Farmers' Federation likened the role of MAFNZ to 'putting Dracula in charge of the blood bank'.

12.83 Given these suggestions, the AAPGA submitted that all inspections should be conducted by AQIS officials during the first five years of the operation of the protocol:

> Where the industry may have a lack of confidence in the AFFA department that is undertaking the risk analysis, it has every confidence in the expertise of AQIS inspectors. Their reputation for being amongst the most efficient in the world warrants this confidence.[84]

12.84 In response, Senator McKiernan noted in hearings on 16 February 2001 that if New Zealand growers wished deliberately to sabotage the Australian industry, then they are more likely to sabotage the industry now, when apple imports are prohibited, than when the market is opened up.[85]

12.85 In its response to protocol 10, the New Zealand Government argued that the requirements for audit of MAFNZ systems is more onerous than the audit schedule AQIS places on Japan (apples), Korea (pears), China (Ya pears), the Philippines (mangos) and Thailand (durian). At most, AQIS visits these countries once a year,

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81 Submission 33, p 39

82 Submission 7, p 13

83 Submission 36, p 4

84 Submission 33, p 39

85 Evidence, RRAT, 16 February 2001, p 302

plus a specialist visit in the first year of trade. Accordingly, the New Zealand Government submitted that this is 'unjustifiable discrimination'.[86]

Protocol 11: On-arrival Inspection

12.86 BA proposed in the draft IRA that upon the arrival of a consignment of New Zealand apples in Australia, AQIS would complete a check of documentation and an on-arrival inspection of a sample of the apples, consistent with its National Sampling Plan:

- A systematic random sample of 600 apples per consignment (apples covered by a phytosanitary certificate) would be inspected on arrival by AQIS.
- Fruit showing damage, rot or punctures would be cut for internal examination and remaining fruit inspected in accordance with the standard AQIS practice.
- If endophytic infections were confirmed in the sample, the consignment would be re-exported or destroyed and further trade suspended.
- The reason for failure would be established and appropriate remedial action agreed upon between AQIS and MAFNZ before trade was permitted to recommence.
- AQIS would also conduct an on-arrival check of container seals and documentation. Broken seals on containers and incomplete documentation would also result in rejection of fruit.[87]

12.87 In response to these measures, the QFVG Apple Committee and Queensland Fire Blight Task Force argued in their supplementary written submission that a statistically valid sample of healthy fruit should be taken from each "lot" and tested in a laboratory for *Erwinia amylovora*. As before, visual inspection alone will not guarantee freedom of *Erwinia amylovora*.

12.88 At the same time however, Mr Paton from NSW Agriculture indicated his belief that the inspection of 600 fruit – involving dissection in some instances – could take up to 6 hours (if each and every fruit is dissected and inspected under the microscope). Accordingly, Mr Paton suggested that such a measure would not be consistently applied.[88]

12.89 In response, the New Zealand Government argued in its written submission that on-arrival inspections have the potential to restrict trade through unjustifiable

86 Submission 24, p 48

87 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, pp 126-127

88 Evidence, RRAT, 9 March 2001, p 442

delays in cargo clearance, while at the same time the chance of detecting *Erwinia amylovora* would be close to zero.[89]

The Cost of Implementing the Protocols

12.90 Senator Ferris raised during hearings on 15 February 2001 the compliance costs that would be faced by New Zealand apple growers wishing to export to the Australian market. In response, Mr Green from the SA Pome Fruit Improvement Committee indicated his belief that New Zealand growers would find it very difficult:

> They occupy some of the best land, particularly in Hawke's Bay, nice land, nice and flat, and they jam in their orchards. How can they put buffer zones without removing large strips around those orchards? I would think they would find it very difficult.[90]

12.91 In this regard, the Committee notes evidence from Mr Ivess from MAFNZ that New Zealand authorities have recently approached Japanese authorities to renegotiate the current protocols for export of New Zealand apples to Japan, on the basis that they are too trade restrictive.[91] Hale, Taylor and Clark (1995) state:

> Research over a number of years suggests parts of the regulatory system regarding export of apples from New Zealand to Japan could be the subject of renegotiation. The buffer zone around many New Zealand orchards is extremely difficult to inspect as orchards are very often only relatively small and the 500m zone can encroach on rivers and steep hill country.[92]

12.92 In addition, research by Roberts *et al* (1998) estimated that under the current NZ and US export programs to Japan, the likelihood of an outbreak of fire blight is one year in every 38,462. Should Japan relax its protocols to remove buffer zones and require only one pre-harvest orchard inspection, Roberts *et al* estimated the likelihood of an outbreak at one year in every 11,971.[93]

12.93 The Committee notes that New Zealand growers took the decision in 2000/2001 not to export apples to Japan, on the basis that meeting the protocols was not economically feasible.[94]

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89 Submission 24, p 49

90 Evidence, RRAT, 15 February 2001, p 228

91 Meeting between the Committee and officials from MAFNZ and MFATNZ, Wellington, 15 May 2001

92 C.N.Hale, R.K.Taylor, R.G.Clark & T.A.Batchelor, 'Quarantine and Market Access' in W.G.Bonn (ed), *Seventh International Workshop on Fire Blight*, (Acta Horticulturae No 411, International Society of Horticultural Science, 1996), p 63

93 R.G.Roberts, C.H.Hale, T.van der Zwet, C.E.Miller & S.C.Redlin, 'The Potential for Spread of *Erwinia Amylovora* and Fire Blight via Commercial Apple Fruit: A Critical Review and Risk Assessment', *Crop Protection*, (Vol 17, No 1, 1998), p 19

94 Correspondence from Biosecurity Australia, 27 March 2001

Summary of the Protocols

12.94 Reactions to the proposed protocols varied considerably. In its written submission, the AAPGA argued that the BA protocols are largely ineffectual, and fail sufficiently to reduce the probability of entry of *Erwinia amylovora* into Australia in/on apples from New Zealand. In this regard, particular note should be made of protocols 1 and 2. As before, BA nominated these two protocols as the principal strategies for reducing the likelihood of *Erwinia amylovora* being present in the calyx.[95]

12.95 In his written submission, Dr Wimalajeewa also argued that protocols 1 and 2 are largely ineffectual, on the basis that it is virtually impossible to detect the presence of *Erwinia amylovora* in an orchard under conditions where there are no visible signs of disease. In addition, as BA acknowledges, protocol 4 – the dipping of apples in chlorine solution – would not kill some bacteria in the calyx.[96] Dr Wimalajeewa continued:

> … it is evident that the combined effect of the 11 strategies proposed – the systems approach – will only result in a marginal, or at best a "low" reduction of the unrestricted risk associated with proposed imports.[97]

12.96 Given these concerns, PIRSA noted in its supplementary submission that the protocols rely completely on "off shore" measures – there are no "second lines of defence" that reduce the risk of establishment or spread:[98]

> The use of a combination of protocols covering not only entry, but also aimed at establishment and spread would more reliably protect Australia's pome fruit industry. Such additional protocols need to take into account the need for appropriate disposal of "waste NZ apples" from repacking operations and/or the wholesale/retail supply chain. BA does not appear to have considered this mode for movement and disposal of potentially contaminated NZ fruit into major apple production districts.[99]

12.97 Mr Philp from PIRSA reiterated in hearings that BA needs to give consideration to strategies that function beyond the port or container terminal such as improving methods of securing disposal of waste from imports and constraining movement of imported products to suburban areas.[100] The Committee is unsure however how this could possibly be achieved.

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95 Submission 33, p 40

96 Evidence, RRAT, 13 February 2001, pp 143-144

97 Evidence, RRAT, 13 February 2001, p 144

98 Submission 37A, p 2

99 Submission 37A, p 9-10

100 Evidence, RRAT, 15 February 2001, p 256

12.98 By contrast with these arguments, the New Zealand Government argued that the proposed protocols are more trade restrictive than necessary:

a) there is no justification for the establishment of detection zones;

b) the need for segregation and disinfestation of bins is unsupported by data;

c) the disinfestation of fruit by chlorine dipping is redundant;

d) the requirement for a 1m separation of product in cold storage is unjustified;

e) the requirement for packing fruit into cartons before storage is unsupported;

f) the on-arrival inspection of fruit adds no further security to the system; and

g) the proposed audit schedule is more onerous than that required in the case of other completed draft IRAs.[101]

12.99 Similarly, Prof Aldwinckle indicated in evidence his belief that the draft IRA, if implemented in its current form, is 'very conservative', and would result in an absolutely minimal risk of *Erwinia amylovora* becoming established in Australia.[102]

12.100 The Committee acknowledges the New Zealand Government's concern that the protocols as proposed in the draft IRA place a large number of costly requirements on New Zealand growers and authorities. In this regard, the Committee reaffirms its understanding that the protocols reached in the final IRA should not be more trade restrictive than is necessary to protect plant and life or health in Australia.

The Draft Risk Management Protocols for other Pests

Insects and Mites

12.101 BA identified three protocols in the draft IRA for managing the nine arthropod pests (eight insects and a mite) identified by the risk assessment as outside Australia's ALOP. Those protocols were pre-harvest orchard surveys, phytosanitary inspections and enhanced on-arrival inspections. Phytosanitary inspections are already a mandatory requirement for all fresh fruit imported into Australia.[103]

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101 Submission 24, pp 43-44

102 Evidence, RRAT, 29 March 2001, p 380

103 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 104

12.102 BA indicated that implementation of either pre-harvest orchard surveys and enhanced on-arrival inspections, or phytosanitary inspections and enhanced on-arrival inspections, would ensure that the risk posed by the nine arthropod pests was reduced to "very low", in line with Australia's ALOP. The generic requirements of each protocol are set out below.[104]

Protocol 1: Pre-harvest Orchard Survey

12.103 A pre-harvest orchard survey is designed to ensure that a pest does not occur in an REB in New Zealand at a level which would pose more than a "very low" risk of the pest being present on the fruit.[105]

12.104 As before, such surveys are carried out by experienced field entomologists, or trained personnel under their supervision. The survey is based on a sample of trees, which are inspected for pests or signs of damage on leaves or on fruit from pests. Where pests or damage from pests is found, the plantation is rejected as a source for export fruit during the current season.[106]

Protocol 2: Phytosanitary Inspection

12.105 Phytosanitary inspection of fruit at the packinghouse is carried out by AQIS for a range of pests under its National Sampling Plan. The sampling protocol requires inspection for pests using random samples of 600 individual apples per homogeneous 'lot'. As before, lots are consolidated into consignments prior to export.

12.106 If no pests are detected by the phytosanitary inspection, AQIS is 95% confident that not more than 0.5% of the apples in the lot are infested. However, where a quarantine pest is intercepted in a sample, the lot from which it is drawn is rejected.[107]

Protocol 3: Enhanced On-arrival Inspection

12.107 Enhanced on-arrival inspection of apples entering Australia would involve dissecting of a sample of apples, which is not done in standard on-arrival inspections of fruit. Dissection of the apples would reveal quarantine pests hidden in the calyx or feeding internally. The detection of a quarantine pest would result in the consignment being rejected.[108]

104 *Ibid*

105 *Ibid*

106 *Ibid*

107 *Ibid*, pp 104-105

108 *Ibid*, pp 105-106

Response to the Protocols

12.108 In its written submission, Agriculture Western Australia commented that as a consequence of the focus on *Erwinia amylovora* in the draft IRA, the analysis of the risks posed by arthropod pests, and the protocols proposed to reduce the risks, could be better considered and presented. In particular, Agriculture Western Australia suggested that:

a) there is only brief explanation of how the REBs will be inspected for arthropods. A sampling protocol should be outlined in the IRA based on scientific methodology to 'ensure that the pests do not occur in the REB at levels that would pose more than a very low risk of them being present on the fruit'.[109]

b) If only 600 pieces of fruit are inspected per lot, the 95 per cent statistical confidence is that no more than 0.5 per cent of fruit will be infested. However, given that up to 200 million pieces of fruit may be imported, that still represents 1 million pieces of fruit.[110]

Fungi

12.109 As discussed in Chapter Nine, the fungus *Nectria galligena* (European canker) can infect apples, gaining entry through fruit lenticels, the calyx-end and wounds. To address the risk posed by European canker, BA proposed two strategies in the draft IRA:

Protocol 1: Orchard Freedom

- In order to establish that a REB is free from European canker, annual visual inspections would be carried out on all trees in the REB and the detection zones;
- Inspection would preferably be undertaken in REBs and detection zones at full bloom but not at fruitlet stage;
- These inspections could be combined with inspection for fire blight symptoms.[111]

Protocol 2: Phytosanitary Inspection and Certification

- Only fruit from REBs inspected and found free from European canker in the year of export would be permitted for export to Australia;

12.110 Fruit must be inspected at pre-export inspection for any fruit infection (eye rot) symptoms.[112]

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109 Submission 52, p 4

110 Submission 52, p 5

111 Biosecurity Australia, *Draft Import Risk Analysis on the Importation of Apples from New Zealand*, October 2000, p 127

Alternatives to the Draft Risk Management Protocols

12.111 The Committee wishes to highlight a possible alternative to the protocols outlined in the draft IRA.

12.112 During the Committee's visit to New Zealand, the Committee visited the packinghouse of Apollo Fruit in Hastings, New Zealand. Apollo has recently trialed a new sampling regime approved by the US Department of Agriculture (USDA). It is called the Reduced sample trial (RST).[113]

12.113 The RST differs from normal USDA sampling methods because it samples apples destined for the US at the point of packing, rather than the point of entry into the USA. Under the trial, a total of 3,000 apples are taken at random during sorting of each USDA approved lot. These 3,000 apples are then subject to detailed inspection for pests of quarantine concern.

12.114 The Committee believes that a similar regime could possibly be implemented for inspection of New Zealand apples destined for Australia for the presence of *Erwinia amylovora* and other pests. In this regard, Dr Hale informed the Committee of new DNA sampling methods which could potentially reduce the cost of sampling 100 apples for the presence of *Erwinia amylovora* to around $20 Australia per sample.[114]

12.115 While the Committee believes that such sampling arrangements could possibly provide a viable alternative to the current proposed protocols in the draft IRA, it nevertheless notes that the RST includes a number of obligations on Apollo in relation to product security and traceability. The Committee has attached an outline of the current USDA RST at Appendix 4.

112 *Ibid*, p 128

113 Mr Simon Thursfield, Packhouse Manager – Apollo Fruit, Correspondence, 14 June 2001

114 Meeting between the Committee and officials from the Horticulture and Food Research Institute of New Zealand, 17 May 2001