Australian Government

Biosecurity Australia

Final Extension of Policy for the Importation of Pears from the People's Republic of China

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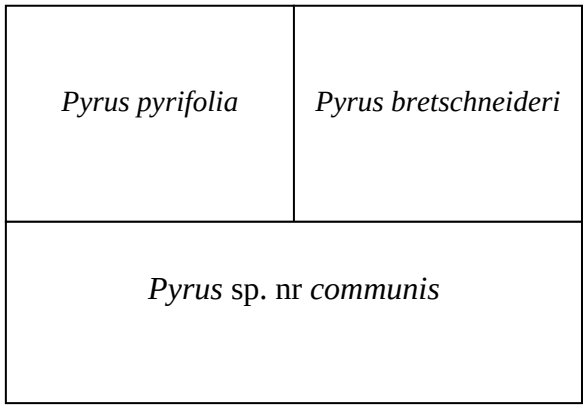

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GLOSSARY OF TERMS AND ABBREVIATIONS

Additional declaration	a statement that is required by an importing country to be entered on a phytosanitary certificate and which provides specific additional information pertinent to the phytosanitary condition of a consignment
ALOP	appropriate level of protection
AQIS	Australian Quarantine and Inspection Service
AQSIQ	General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China
Area	an officially defined country, part of a country or all or parts of several countries
Biosecurity Australia	a prescribed agency within the Australian Government Department of Agriculture, Fisheries and Forestry. Biosecurity Australia provides science based quarantine assessments and policy advice that protects Australia's favourable pest and disease status and enhances Australia's access to international animal and plant related markets.
China	the People's Republic of China
CIQ	Entry-Exit Inspection and Quarantine Bureau of the People's Republic of China.
CIQ SA	State Administration for Entry-Exit Inspection and Quarantine of the People's Republic of China (now AQSIQ)
Consignment	a quantity of plants, plant products and/or other articles being moved from one country to another and covered, when required, by a single phytosanitary certificate (a consignment may be composed of one or more commodities or lots)
Control (of a pest)	suppression, containment or eradication of a pest population
DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
Endangered area	an area where ecological factors favour the establishment of a pest whose presence in the area will result in economically important loss
Entry (of a pest)	movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled
Establishment	the perpetuation, for the foreseeable future, of a pest within an area after entry
Establishment potential	likelihood of the establishment of a pest
FAO	Food and Agriculture Organization of the United Nations

Fresh	living; not dried, deep-frozen or otherwise conserved
Fruits and vegetables	a commodity class for fresh parts of plants intended for consumption or processing and not for planting
Host range	species of plants capable, under natural conditions, of suiting a specific pest
ICON	AQIS Import Conditions database
Import Permit	official document authorising importation of a commodity in accordance with specified phytosanitary requirements
Infestation (of a commodity)	presence in a commodity of a living pest of the plant or plant product concerned. Infestation includes infection
Inspection	official visual inspection of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations
Intended use	declared purpose for which plants, plant products, or other regulated articles are imported, produced, or used
Interception (of a pest)	the detection of a pest during inspection or testing of an imported consignment
Introduction	entry of a pest resulting in its establishment
IPPC	International Plant Protection Convention, as deposited with FAO in Rome in 1951 and as subsequently amended
IRA	Import Risk Analysis, an administrative process through which quarantine policy is developed or reviewed, incorporating risk assessment, risk management and risk communication
ISPM	International Standard on Phytosanitary Measures
Lot	a number of units of a single commodity, identifiable by its homogeneity of composition, origin etc., and forming part of a consignment
National Plant Protection Organisation	official service established by a government to discharge the functions specified by the IPPC (DAFF is Australia's NPPO)
Official control	the active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or for the management of regulated non-quarantine pests
Pathway	any means that allows the entry or spread of a pest
Pest	any species, strain or biotype of plant, animal, or pathogenic agent, injurious to plants or plant products
Pest categorisation	the process for determining whether a pest has or has not the characteristics of a quarantine pest or those of a regulated non-quarantine pest
Pest free area	an area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained

Pest risk analysis	the process of evaluating biological or other scientific evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it
Pest risk analysis area	area in relation to which a pest risk analysis is conducted
Pest risk assessment (for quarantine pests)	evaluation of the probability of the introduction and spread of a pest and of the associated potential economic consequences
Pest risk management (for quarantine pests)	evaluation and selection of options to reduce the risk of introduction and spread of a pest
Phytosanitary certificate	Certificate patterned after the model certificates of the IPPC
Phytosanitary measure	any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests
Phytosanitary regulation	official rule to prevent the introduction and/or spread of quarantine pests, by regulating the production, movement or existence of commodities or other articles, or the normal activity of persons, and by establishing schemes for phytosanitary certification
Polyphagous	feeding on a relatively large number of host plants from different plant families
Quarantine pest	a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled
Regulated article	any plant, plant product, storage place, packing, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved
Restricted risk	'Restricted' risk estimates are those derived when risk management measures are used
Spread	expansion of the geographical distribution of a pest within an area
SPS Agreement	WTO Agreement on the Application of Sanitary and Phytosanitary Measures
Stakeholders	Government agencies, individuals, community or industry groups or organisations, whether in Australia or overseas, including the proponent/applicant for a specific proposal
Unrestricted risk	'Unrestricted' risk estimates are those derived in the absence of risk management measures
WTO	World Trade Organization

EXECUTIVE SUMMARY

Subject to a range of risk management measures and phytosanitary procedures, Australia currently permits the importation of the following fresh pear fruit species from China:

- *Pyrus bretschneideri* (Hebei and Shandong Provinces only);
- *Pyrus pyrifolia* (Shandong Province only); and
- *Pyrus ussuriensis* (Shandong Province only).

These risk management measures and phytosanitary procedures are focussed on reducing the risk associated with the importation of fresh pear fruit from Hebei and Shandong Provinces in China (AQIS 1998; AFFA 2003a; AFFA 2003b)

The People's Republic of China requested permission for the importation of the following additional fresh pear fruit species and regions:

- *Pyrus bretschneideri* (Shaanxi Province);
- *Pyrus pyrifolia* (Hebei and Shaanxi Provinces); and
- *Pyrus* sp. nr. *communis* (Xinjiang Uighur Autonomous Region).

This final extension of import policy has assessed the pests potentially associated with the fresh pear fruit of an additional pear species and additional pear production regions outlined above. Biosecurity Australia concludes that the pests do not pose significantly different quarantine risks, or require significantly different risk management measures, than those that are currently enforced under the existing import policy.

As such, consistent with the existing import policy for fresh pear fruit from China, the following risk management measures and phytosanitary procedures will be implemented so as to ensure that the risk associated with the importation of these pear species meet Australia's appropriate level of protection (ALOP):

- monitoring system for Oriental fruit fly;
- systems approach for arthropod pests;
- systems approach for pathogens;
- operational system for the maintenance and verification of the phytosanitary status of the pears in question, including:
  - importation of permitted species only (*Pyrus bretschneideri*, *Pyrus pyrifolia* and *Pyrus ussuriensis* from Hebei, Shaanxi and Shandong Provinces, and *Pyrus* sp. nr. *communis* from Xinjiang Uighur Autonomous Region);
  - registration of export orchards;
  - registration of packing houses and auditing of procedures;
  - packaging and labelling requirements;
  - specific conditions for storage and movement;
  - joint pre-clearance phytosanitary inspection by Australian and Chinese authorities;
  - phytosanitary certification by Chinese authorities; and
  - on-arrival quarantine clearance by Australian authorities.

Biosecurity Australia circulated the draft extension of existing policy report in April 2005. Stakeholder comments were considered and material matters raised were incorporated into, or addressed in, this final report.

Three pests were assessed and categorised as quarantine pests in addition to those pests considered in the draft report. Detailed risk assessments of these three pests were conducted to determine an unrestricted risk estimate for each species. The three pests assessed were: chocolate spot of Ya Li pear (*Alternaria yaliinficiens*), European pear rust (*Gymnosporangium sabinae*), and the Japanese pear weevil (*Rhynchites heros*). Risk management measures were considered to be required for European pear rust for which the unrestricted risk was not considered to meet Australia's ALOP. However, the risk management measures currently in place for Japanese pear rust were considered appropriate to reduce the unrestricted risk for European pear rust to meet Australia's ALOP.

Biosecurity Australia has made changes to the risk assessments following consideration of stakeholder comments on the draft extension of existing policy. These changes include:

- Removal of Oriental fruit moth (*Grapholita molesta*) from the quarantine pest list because this pest is present in Australia except Western Australia and under current state legislation fresh pears are not allowed into Western Australia.
- Removal of valsa canker (*Valsa ambiens*) from the quarantine pest list as this pathogen has been recorded in Australia.
- Removal of subspecies of popular looper (*Apocheima cinerarium* subsp. *piri* Yang) as a new pest from Hebei. The correct name is *Apocheima cinerarius* Erschoff and this pest has previously been considered.
- Inclusion of detailed risk assessments for Japanese pear weevil (*Rhynchites heros*), chocolate spot of Ya Li pear (*Alternaria yaliinficiens*) and European pear rust *(Gymnosporangium sabinae).*
- Correction of the spelling of *Acrobasis pyrivorella* (Matsumura) and *Sphanostigma iakusuiense* (Kishida) in the quarantine pest lists.
- The use of scientific names rather than common names or cultivar names wherever possible throughout the document.
- Inclusion of species *Pyrus ussuriensis* from Hebei, Shandong and Shaanxi Provinces.

This report presents details of recommended final import conditions, including risk management measures and operational procedures for pear species from China.

INTRODUCTION

Biosecurity Australia is a prescribed agency within the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF). Biosecurity Australia is responsible for developing international quarantine policy for imports and for liaising with overseas National Plant Protection Organisations (NPPOs) to determine their requirements for exports of Australian plants and plant products.

In 2001, 2003 and 2004 China requested market access for *Pyrus pyrifolia* (Burm.) Nakai from Hebei, *Pyrus pyrifolia* and *Pyrus bretschneideri* Rehd. from Shaanxi Province and *Pyrus* sp. nr. *communis* from Xinjiang Uighur Autonomous Region into Australia.

Quarantine policy currently exists for the importation into Australia of *Pyrus bretschneideri* from Hebei and Shandong Provinces and *Pyrus pyrifolia* and *Pyrus ussuriensis* Maxim. from Shandong Province. Trade in *Pyrus bretschneideri* from Hebei commenced in 1999 and from Shandong in 2000. Trade in *Pyrus pyrifolia* and *Pyrus ussuriensis* from Shandong commenced in 2003.

The pear species and provinces / region that Biosecurity Australia has considered in this extension of policy report are listed in Table 1.

Table 1: *Pyrus* species and provinces / regions considered in this report (new importation requests indicated by shading)

Province / Region	*P. bretschneideri*	*P. pyrifolia*	P. *ussuriensis*	*P.* sp. nr.*communis*
Hebei	✓	✓	✓	
Shaanxi	✓	✓	✓	
Shandong	✓	✓	✓	
Xinjiang Uighur				✓

An assessment by Biosecurity Australia of the pests potentially associated with species of pears from China covered by this extension of policy (Hebei, Shandong, Shaanxi Provinces and Xinjiang Uighur Autonomous Region) indicated that the pests do not pose significantly different quarantine risks, or require significantly different management measures, than those for which policy already exists. Biosecurity Australia therefore determined that the market access request for one new pear species, *P*. sp. nr. *communis*, from Xinjiang Uighur Autonomous Region, and the request for expansion of export areas of *P. bretschneideri* from Shaanxi Province and *P. pyrifolia* and *P. ussuriensis* from Hebei and Shaanxi Provinces could be progressed as a further extension of existing policy.

The extension of policy is based on policy for the importation of *P. bretschneideri* from Hebei and Shandong Provinces detailed in an import risk analysis (IRA) (AQIS, 1998), the review of pome fruit from north Asia (AFFA, 2003a) and the extension of existing policy for *P. pyrifolia* and *P. ussuriensis* from Shandong Province (AFFA, 2003b).

Plant Biosecurity Policy Memorandum 2005/07 advised stakeholders that the access request had been considered as an extension of existing policy on 8 April 2005 with the concurrent release of the *Draft Extension of Existing Policy for Pears from the People's Republic of China*.

As the initial step in this pest risk analysis (PRA) process, Biosecurity Australia identified and categorised three pests associated with pears from China that were not considered in the IRA (AQIS, 1998) or previous review (AFFA, 2003b). Detailed risk assessments of these three pests were conducted to determine an unrestricted risk estimate for each new species. The three pests assessed were: chocolate spot of Ya Li pear (*Alternaria yaliinficiens*), European pear rust (*Gymnosporangium sabinae*), and the Japanese pear weevil (*Rhynchites heros*). Risk management measures were identified for those pests for which the unrestricted risk was not considered to meet Australia's ALOP.

Risk management measures, in addition to the standard commercial practices, were then identified for each new quarantine pest that did not meet the appropriate level of protection (ALOP) for Australia. These risk management measures form part of the recommendations for the final import conditions.

This report contains the following:

- background to this extension of existing policy and Australia's current quarantine policy for imports of fresh pears;
- methodology and results of pest categorisation and risk assessment;
- risk management measures;
- final import conditions; and
- a summary table of stakeholders who commented on the draft extension to existing policy for pears released in April 2005.

2 THE PEAR INDUSTRY IN AUSTRALIA

Australia produces on average 169,000 tonnes of fresh pear fruit each year (ABS, 2004; APAL, 2002). Around 40% of the Australian pear fruit crop is produced for the domestic market as fresh fruit, 45% is processed, and the remaining 15% is exported (FAS, 2002b). Australia's average production represents 1.4% of the world production of pears (APAL, 2002). The main varieties of traditional European pears (*Pyrus communis*) grown commercially in Australia are Packham's Triumph, Williams Bon Chretin (WBC, also called Bartlett and Duchess) and Buerre-Bosc. These varieties represent 92% of Australian pear orchard production (APAL, 2002). WBC is the major canning variety but is also popular as a fresh eating variety early in the season. Packham's Triumph is grown for the fresh fruit market and is the main variety exported from Australia (FAS, 2002a; Mitchelmore and Morenos, 1995). Other major varieties of *P. communis* cultivated in Australia are Josephine de Malines, Winter Nelis and Sensation (red variety). Minor varieties are Clapp's Favourite, Winter Cole, Lemon Bergamot and Doyenne du Comice.

Nashi pears, predominantly *P. pyrifolia* but also including *P. bretschneideri and P. ussuriensis* were introduced and released in Australia in the 1980-1990s. Nashi pears were established as a commercial horticultural industry in Australia. About 80% are consumed fresh and the remainder are processed, mostly for juice. The main variety of *P. pyrifolia* is Nijisseiki (90%) and some Hosui, Kosui (Coombs, 1995) and Shinsui varieties are also in commercial production. Australian pear producers continue to trial and develop additional new varieties and species.

2.1 Pear production in Australia

Pear fruit is grown commercially in all Australian states (Table 2). The majority of Australia's pear production occurs in Victoria, with 119,156 tonnes (87.7% of the total yield) produced in 2003 (ABS, 2004).

Table 2: Australia's pear production for 2002 - 03 (excluding *P. pyrifolia* pears) (ABS, 2004).

State	Production (tonnes)	% of Total
Victoria	119,156	87.7
Western Australia	9,135	6.7
South Australia	5,385	3.9
New South Wales	769	0.6
Queensland	687	0.5
Tasmania	783	0.6
Total	**135,915**	**100**

The main Australian pear growing areas are in regions with mild summer temperatures and cool to cold winters. These include: the Goulburn Valley in Victoria; Orange and Batlow in New South Wales; Stanthorpe in southern Queensland; the Perth Hills, Donnybrook and Manjimup in Western Australia; the Adelaide Hills in South Australia; and Spreyton, Huon Valley and the Tamar Valley in Tasmania.

The largest number of pear growers is in the Goulburn Valley region of Victoria, where there are 3,000 hectares of orchards. There are around 140 pear growers in southern Victoria.

The Goulburn Valley area also produces 80% of Australia's Nashi pears. The remainder are produced in Young (New South Wales), the Adelaide Hills (South Australia) and Donnybrook (Western Australia). There are about 65 Nashi pear producers in Australia with 300,000 trees in 500 hectares of orchards (Horticulture Australia Limited, 2003a). It is estimated that 3,500 tonnes of Nashi pears were produced in Australia in 2003 (Horticulture Australia Limited, 2003b).

2.2 Export of pears from Australia

Exports of fresh pears have varied considerably during the past decade, ranging from 18,000 – 35,000 tonnes annually. In 2002, Australia exported 18,472 tonnes of fresh pears, mainly to south-east Asia including Singapore, Malaysia and Indonesia. Canada is another important market for Australian pears (Darby, 2003).

2.3 Import of pears into Australia

Australia has permitted the importation of *P. pyrifolia* from Japan since 1989 and *P. ussuriensis* from the Republic of Korea since 1999. From China, *P. bretschneideri* has been permitted since 1999 and *P. pyrifolia* and *P. ussuriensi*s since 2003 (Table 3).

Table 3: Quantities of pears (in tonnes) imported into Australia from China, Japan and Korea (1999-2004)

Year	*P. bretschneideri P. pyrifolia and P. ussuriensis* from China	*P. pyrifolia* from Japan	*P. ussuriensis* from Korea
1999-00	1,204	71	15
2000-01	2,620	28	12
2001-02	1,552	10	17
2002-03	1,414	31	25
2003-04	3,713	36	<1

3 PROPOSAL TO IMPORT PEARS FROM CHINA

3.1 Background

Australia currently permits the importation of the following species of fresh pear fruit from China: *Pyrus bretschneideri* from Hebei and Shandong Provinces, and *Pyrus pyrifolia* and *Pyrus ussuriensis* from Shandong Province.

3.1.1 *Pyrus bretschneideri* (including Ya pears) from Hebei and Shandong Provinces

The Australian Quarantine and Inspection Service (AQIS) received an application from China in April 1992 seeking market access for *P. bretschneideri* fruit from Hebei and Shandong Provinces into Australia. The 'Final IRA of the Importation of Fruit of Ya Pear (*Pyrus bretschneideri* Redh.) from the People's Republic of China (Hebei and Shandong Provinces)' (AQIS, 1998) led to the commencement of trade in *P. bretschneideri* fruit from Hebei Province in October 1999. This was followed by trade of *P. bretschneideri* fruit from Shandong Province in October 2000.

3.1.2 Review of pome fruit from north Asia

In January 2003, Biosecurity Australia completed a review of all existing import conditions for pome fruit imports from north Asia into Australia. This review concluded that the measures of petal testing for brown rot and black spot, and flower cluster examination at blossoming for scab on Ya pear from China did not provide any additional biosecurity measure. Removal of these measures from the import protocol was recommended. The amended import conditions for *P. bretschneideri* fruit came into effect in the 2003 season.

3.1.3 *Pyrus pyrifolia* and *P. ussuriensis* (Asian/Shandong pears) from Shandong Province

At the China-Australia bilateral plant quarantine technical discussions held in Beijing in March 2001, the former State Administration for Entry-Exit Inspection and Quarantine of the People's Republic of China (CIQ SA) requested access for *P. pyrifolia* pears from Shandong Province. Biosecurity Australia conducted a preliminary comparison of the Chinese pest lists and requested additional information from AQSIQ. In addition, a plant pathologist from Biosecurity Australia visited the existing and potential export orchards for pears in Shandong Province.

Based on this information, Biosecurity Australia assessed that the import proposal for pears from Shandong Province could be considered as an extension of the existing policy for *P. bretschneideri* from Hebei and Shandong Provinces. Details of this assessment are given in 'Import of Asian (Shandong) pear (*Pyrus pyrifolia* (Burm.) Nakai and *P. ussuriensis* var. *viridis* T. Lee.) fruit from Shandong Province in the People's Republic of China – A review under existing import conditions for Ya pear (*Pyrus bretschneideri* Redh.) fruit from Hebei and Shandong Provinces' (AFFA, 2003b). Trade in *P. pyrifolia* and *P. ussuriensis* pears from Shandong commenced in October 2003.

3.1.4 *Pyrus pyrifolia* and *P. ussuriensis* pears from Hebei Province, *P. bretschneideri*, *P. ussuriensis* and *P. pyrifolia* pears from Shaanxi Province, and *P.* sp. nr *communis* pears from Xinjiang Uighur Autonomous Region

From March 2001 to May 2004, Biosecurity Australia received requests from the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) for extension of market access into Australia of *Pyrus bretschneideri* and *Pyrus pyrifolia* from Shaanxi Province, *Pyrus pyrifolia* from Hebei Province, and new access for *Pyrus* sp. nr. *communis* from Xinjiang Uighur Autonomous Region. *Pyrus* sp. nr. *communis* (Fragrant pear) is a different species to the two species already considered and already permitted access to Australia from China under existing policy (AQIS 1998, AFFA 2003b). The requests from AQSIQ included background information on pear production, a list of additional pests and diseases occurring in Hebei and Shaanxi Provinces and Xinjiang Uighur Autonomous Region, and details of standard production and pest management measures in place in these areas.

Following a preliminary comparison of initial pest lists, Biosecurity Australia determined that the quarantine risks of pests and diseases associated with the additional pear species (*P*. sp. nr. *communis*) and export regions are very similar to those covered by existing policy. Some quarantine pests for which policy already exists include: Oriental fruit fly; pear weevil; Comstock mealybug; tortricid, pyralid and other fruit moths; black spot, brown rot; Japanese pear rust; Japanese pear scab; and physalospora canker.

On the basis of the small number of additional quarantine pests identified following the preliminary assessment, Biosecurity Australia proposed to conduct the review as an extension of policy. The draft extension of existing policy for fresh pear fruit from China document was released on 8 April 2005 to stakeholders. Stakeholders were requested to provide comments within 30 days. Biosecurity Australia received comments from seven stakeholders including the proponent country. Stakeholder comments were considered and material matters raised were incorporated into, or addressed in, this final report.

In late July 2005, a plant pathologist from Biosecurity Australia visited the pear production areas in Xinjiang Uighur Autonomous Region and Shaanxi Province with AQSIQ and the Entry-Exit Inspection and Quarantine Bureau of the People's Republic of China.(CIQ) to survey for quarantine pests and inspect export orchards and audit packing houses. Information and observations from the visit were considered and incorporated into this report.

3.2 Scope of final extension of policy

Biosecurity Australia has considered the quarantine risks associated with the importation of fresh pear fruit from China for the additional quarantine pests identified in the PRA section of this extension of existing policy, in accordance with *ISPM No. 11 (2004): Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*.

The PRA supplements the existing import policy for pear species from China that have been cultivated, harvested, packed and transported to Australia under standard, commercial, agronomic conditions.

3.3 Australia's current quarantine policy for pears

The Commonwealth Government is responsible for regulating the movement of plants and plant products into and out of Australia. However, the State and Territory governments are primarily responsible for plant health controls within Australia. Legislation relating to resource management or plant health may be used by State and Territory government agencies to control interstate movement of plants and their products.

3.3.1 International policy

Australia currently permits the importation of *P. bretschneideri* from China (Hebei and Shandong only), *P. pyrifolia* from China (Shandong only) and Japan, and *Pyrus ussuriensis* from China (Shandong only) and the Republic of Korea. Import conditions for pears from these countries can be found in the AQIS Import Condition (ICON) database at http://www.aqis.gov.au/icon. In addition, a preclearance by AQIS inspectors is required for pear fruit from China and Japan. On-arrival inspection is the requirement for pears from Korea.

3.3.1.1 China

Australia has an import protocol with China (amended January 2003) (Appendix 3) which specifies the details of the import conditions for *P. bretschneideri* from Hebei and Shandong Provinces. This protocol also applies to *P. pyrifolia* and *P. ussuriensis* from Shandong Province, which have been imported since August 2003.

3.4 Pear industry in China

In 2003/04 China became the world's leading producer of pears, producing over half of the world's pears. Commercially cultivated pears in China consist of four main species:

Pyrus bretschneideri (including Ya, Bai, Xue, Changba and Zaosu pears) is mainly grown in northern China, Hebei, Shaanxi, Shandong and Liaoning Provinces and makes up 60% of pear production in the country (Zai-Long, 1999). There are many cultivars in this group.

Pyrus pyrifolia (including Dang Shan Su, Pingguo, Sha, Huangjin (golden), Fengshui, 21st Century pears and Huangguan pears) grow in the Yangtze River valley. They are well adapted to wet conditions and high summer temperatures. Cangxi and Baozhu are important cultivars in the areas where they are produced. Huanghai and Jinshu 2 are newly developed cultivars and are planted extensively. The Japanese cultivars belong to the sand pear category, and cultivars such as New Century, Kosui and Shin sui are also important.

Pyrus sp. nr. *communis* (known as Fragrant pears) from Xinjiang Uighur Autonomous Region is a *Pyrus* species differing from *P. bretschneideri, P. pyrifolia* and *P. ussuriensis* in that it has a persistent calyx, a short flower stalk, and a nearly hairless, unserrated leaf that tapers gradually to a sharp point. The mature pear fruit is of a smaller size, yellow-green and smooth. It has thin skin and is crisp, succulent, sweet and fragrant. Harvest occurs from late-August to mid-September. Xinjiang Uighur Autonomous Region is the largest province in China, covering 1.66 million square kilometres (one-sixth of the country's total land area). It is located in the far northwest of the country and has a

population of 19 million people. The region's boundary of more than 5,600 km adjoins eight countries: Mongolia, Russia, Kazakhstan, Kyrgyzstan, Tazikhstan, Afghanistan, Pakistan and India. The *Pyrus* sp. nr. *communis* pear production area near Korla in the centre of the region is physically very isolated from pear production areas in other provinces by several natural features. It is surrounded by mountains to the north (the Tienshen range) and east (the Kuruktag range), and the Taklimakan Desert to the south (AQSIQ, 2005). The climate of the pear growing areas in Xinjiang Uighur Autonomous Region differs substantially from that of other regions of China. Xinjiang has a dry continental climate with great extremes of winter and summer temperatures (Anon, 2005; AQSIQ. 2005). Rainfall is extremely low; from 20-70 cm per year (Anon, 2005; AQSIQ, 2005). The Korla area does not support a large number of pests and diseases, partly because of this extreme climate, and partly because of the natural desert and mountain barriers preventing pest incursions into that area.

Pyrus ussuriensis (Harbin, Ussurian, Qiuzi pear) is the hardiest of all *Pyrus* species and is grown in the areas north of the Great Wall, especially in northeast China including Hebei, Shandong and Shaanxi Provinces. In general, fruit quality of the cultivars derived from this species is inferior to those of the other species. The fruit is usually smaller and requires a period of post-harvest ripening before it becomes edible. Representative cultivars of this species are An, Da-xiang-shui, Nan-guo and Jing-bei.

3.4.1 Production of pears in China

In 2003, China produced 9.8 million tonnes of pears from plantings covering 1.06 million hectares (Branson *et al*., 2004). Pear production in China has increased steadily during the last 10 years as a result of extensive planting during the 1980s and early 1990s.

Pear production in China is led by Hebei Province (almost one third of the national total), followed by Shandong province (Branson *et al*., 2004). Details of pear production areas and volume of production in China for 2003 are given in Table 4.

Table 4: Pear production area and quantity in China in 2003 (Branson *et al*., 2004). New regions shown in bold text.

Province / region	Production area (thousands of ha)	Quantity of production (thousands of tonnes)
Hebei	213	2,821
Shandong	74	983
Shaanxi	57	690
Anhui	37	583
Hubei	41	564
Xinjiang	48	250

Most of the pear production in Shaanxi Province occurs in the counties of Pu Cheng, Li Quan, Qian Xian, Bin Xian, and Gao Ling (CIQ SA, 2000).

Ya pears (also known as duck pears) are the most widely grown cultivar of *P. bretschneideri* in China and account for 22% of pear production (Branson *et al*., 2004).

Fragrant pear is the second highest value pear in China (Garland, 1995). It was developed and is grown mainly in the Korla area of Xinjiang (Figure 1) in an area of 47.7 thousand hectares (Branson *et al*., 2004).

3.5 Export of pears from China

Pear exports from China have increased considerably in recent years and are becoming more important to Chinese pear growers. China exported about 303,169 tonnes of pears (two percent of total pear production) worth US$85M in 2002-03, compared to almost zero exports 10 years ago (Branson *et al.*, 2004).

Improved fruit quality in China has contributed to the recent expansion of China's export pear market. The market comprises Indonesia (19.5%), Malaysia (14%), Russia (12%), Hong Kong (11%), Viet Nam (9.5%), Thailand (6.5%) and other countries (27.5%) (including Singapore, Philippines, USA, Canada, South Africa, European Union, Australia and New Zealand) (Branson *et al.*, 2004).

Figure 1: Map of China showing the pear production regions of Hebei, Shandong and Shaanxi Provinces and Xinjiang Uighur Autonomous Region

4 METHOD FOR PEST RISK ANALYSIS

An outline of the methodology used for pest risk analysis (PRA) is given to provide the context for the technical information that is provided later in this document. In accordance with the International Standards for Phytosanitary Measures Publication Number 11 *Pest Risk Analysis for Quarantine Pests including Analysis of Environmental Risks and Living Modified Organisms* (ISPM 11), this pest risk analysis comprises three discrete stages:

- Stage 1: initiation
- Stage 2: pest risk assessment
- Stage 3: pest risk management

Stage 1: Initiation

The aim of the *initiation* stage is to identify the pest(s) and pathway(s) (e.g. commodity imports) that are of quarantine concern and should be considered for risk analysis in relation to the identified PRA area.

Stage 2: Pest Risk Assessment

The pest risk assessment is carried out in accordance with International Plant Protection Convention (IPPC) standards and reported in the following steps:

- pest categorisation;
- assessment of probability of entry, establishment or spread; and
- assessment of potential consequences (including environmental impacts).

Pest categorisation

Pest categorisation is a process to examine, for each pest, whether the criteria for a quarantine pest are satisfied. The process of pest categorisation is summarised by the IPPC in the five elements outlined below:

- identity of the pest;
- presence or absence in the endangered area;
- regulatory status;
- potential for entry, establishment or spread in the PRA area; and
- potential for economic consequences in the endangered area.

The pests are categorised according to their presence or absence, their association with the commodity pathway, their potential to establish or spread, and their potential for economic consequences. Categorisation for potential of establishment or spread and potential for economic consequences was expressed using the terms ‘feasible’ / ‘not feasible’, and ‘significant’ / ‘not significant’, respectively.

Pests found to have potential for entry, establishment or spread and potential for consequences satisfy the criteria for a quarantine pest. A quarantine pest is defined as "*A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled*" (FAO, 2002). The methodology used for the detailed risk assessments conducted on the quarantine pests is given below.

Assessment of the probability of entry, establishment or spread

Details of assessing the 'probability of entry', 'probability of establishment' and 'probability of spread' of a pest are given in ISPM 11.

Assessing the probability of entry requires an analysis of each of the pathways with which a pest may be associated, from its origin to distribution in the PRA area. The probability of entry may be divided for assessment purposes into the following components:

The probability of importation: the probability that a pest will arrive in Australia when a given commodity is imported; and

The probability of distribution: the probability that the pest will be distributed (as a result of the processing, sale or disposal of the commodity) to the endangered area, and subsequently be transferred to a suitable site on a susceptible host.

In breaking down the probability of entry into these two components, Biosecurity Australia has not altered the original meaning. The two components have been identified and separated to enable onshore and offshore pathways to be described individually.

The probability of establishment is estimated on the basis of availability, quantity and distribution of hosts in the PRA area; environmental suitability in the PRA area; potential for adaptation of the pest; reproductive strategy of the pest; method of pest survival; and cultural practices and control measures. Similarly, the probability of spread is estimated on the basis of suitability of the natural and/or managed environment for natural spread of the pest; presence of natural barriers; the potential for movement with commodities or conveyances; intended use of the commodity; potential vectors of the pest in the PRA area; and potential natural enemies of the pest in the PRA area.

Qualitative likelihoods are assigned to the probability of entry (comprising an importation step and a distribution step), the probability of establishment and the probability of spread. Likelihoods are categorised according to a descriptive scale from 'high' to 'negligible' as shown in Table 5.

Table 5: Nomenclature for qualitative likelihoods

Likelihood	Descriptive definition
High	The event would be very likely to occur
Moderate	The event would occur with an even probability
Low	The event would be unlikely to occur
Very low	The event would be very unlikely to occur
Extremely low	The event would be extremely unlikely to occur
Negligible	The event would almost certainly not occur

The likelihoods of entry, of establishment and of spread are combined using the tabular matrix shown in Table 6.

Table 6: Matrix of rules for combining descriptive likelihoods

	High	Moderate	Low	V. Low	E. Low	Negligible
High	High	Moderate	Low	V. Low	E. Low	Negligible
Moderate		Low	Low	V. Low	E. Low	Negligible
Low			V. Low	V. Low	E. Low	Negligible
Very low				E. Low	E. Low	Negligible
E. low					Negligible	Negligible
Negligible						Negligible

Assessment of consequences

The basic requirements for the assessment of consequences are described in the SPS Agreement, in particular Article 5.3 and Annex A. Further detail on assessing consequences is given in the "potential economic consequences" section of ISPM 11. This ISPM separates the consequences into "direct" and "indirect" and provides examples of factors to consider within each. In this PRA, the term "consequence" is used to reflect the "relevant economic factors"/"associated potential biological and economic consequences" and "potential economic consequences" terms as used in the SPS Agreement and ISPM 11, respectively.

The direct and indirect consequences were estimated based on four geographic levels. The terms 'local', 'district', 'regional' and 'national' are defined as:

Local: an aggregate of households or enterprises — e.g. 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, such as the 'North West Slopes and Plains' or 'Far North Queensland'

Region: a geographically or geopolitically associated collection of districts — generally a state, although there may be exceptions with larger states such as Western Australia

National: Australia-wide

The consequence was described as:

- '*unlikely to be discernible*' is not usually distinguishable from normal day-to-day variation in the criterion;
- '*minor significance*' is not expected to threaten economic viability, but would lead to a minor increase in mortality/morbidity or a minor decrease in production. For non-commercial factors, the consequence is not expected to threaten the intrinsic 'value' of the criterion — though the value of the criterion would be considered as 'disturbed'. Effects would generally be reversible.
- '*significant*' consequence would threaten economic viability through a moderate increase in mortality/morbidity, or a moderate decrease in production. For non-commercial factors, the intrinsic 'value' of the criterion would be considered as significantly diminished or threatened. Effects may not be reversible; and
- '*highly significant*' would threaten economic viability through a large increase in mortality/morbidity, or a large decrease in production. For non-commercial factors, the

intrinsic 'value' of the criterion would be considered as severely or irreversibly damaged.

The values are translated into a qualitative score (A–F) using the schema outlined in Table 7.

Table 7: The assessment of local, district, regional and national consequences

Impact score	*Local*	*District*	*Regional*	*National*
F	-	-	-	Highly significant
E	-	-	Highly significant	Significant
D	-	Highly significant	Significant	Minor
C	Highly significant	Significant	Minor	Unlikely to be discernible
B	Significant	Minor	Unlikely to be discernible	Unlikely to be discernible
A	Minor	Unlikely to be discernible	Unlikely to be discernible	Unlikely to be discernible

Level

The overall consequence for each pest was achieved by combining the qualitative scores (A–F) for each direct and indirect consequence using a series of decision rules. These rules are mutually exclusive, and are addressed in the order that they appeared in the list — for example, if the first rule does not apply, the second rule is considered. If the second rule does not apply, the third rule is considered and so on until one of the rules applies:

- Where the impact score of a pest with respect to any direct or indirect criterion is 'F', the overall consequences are considered to be 'extreme'.
- Where the impact scores of a pest with respect to more than one criterion are 'E', the overall consequences are considered to be 'extreme'.
- Where the impact score of a pest with respect to a single criterion is 'E' and the impact scores of a pest with respect to each remaining criterion is 'D', the overall consequences are considered to be 'extreme'.
- Where the impact score of a pest with respect to a single criterion is 'E' and the impact scores of a pest with respect to remaining criteria are not unanimously 'D', the overall consequences are considered to be 'high'.
- Where the impact scores of a pest with respect to all criteria are 'D', the overall consequences are considered to be 'high'.
- Where the impact score of a pest with respect to one or more criteria is 'D', the overall consequences are considered to be 'moderate'.
- Where the impact scores of a pest with respect to all criteria are 'C', the overall consequences are considered to be 'moderate'.
- Where the impact score of a pest with respect to one or more criteria is considered 'C', the overall consequences are considered to be 'low'.
- Where the impact scores of a pest with respect to all criteria are 'B', the overall consequences are considered to be 'low'.
- Where the impact score of a pest with respect to one or more criteria is considered 'B', the overall consequences are considered to be 'very low'.
- Where the impact scores of a pest with respect to all criteria are 'A', the overall consequences are considered to be 'negligible'.

Method for determining the unrestricted risk estimate

The unrestricted risk estimate for each pest is determined by combining the likelihood estimates of entry, of establishment and of spread with the overall potential consequences. This is done using the risk estimation matrix shown in Table 8. The cells of this matrix describe the product of likelihood of entry, establishment or spread and consequences of entry, establishment or spread.

Table 8: Risk estimation matrix

Likelihood of entry, establishment or spread	Negligible impact	Very low	Low	Moderate	High	Extreme impact
High likelihood	Negligible risk	Very low risk	Low risk	Moderate risk	High risk	Extreme risk
Moderate	Negligible risk	Very low risk	Low risk	Moderate risk	High risk	Extreme risk
Low	Negligible risk	Negligible risk	Very low risk	Low risk	Moderate risk	High risk
Very low	Negligible risk	Negligible risk	Negligible risk	Very low risk	Low risk	Moderate risk
Extremely low	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Very low risk	Low risk
Negligible likelihood	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Very low risk

Consequences of entry, establishment or spread

Australia's appropriate level of protection (ALOP)

The SPS Agreement defines the concept of an 'appropriate level of sanitary or phytosanitary protection (ALOP)' as the level of protection deemed appropriate by the WTO Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory.

Like many other countries, Australia expresses its ALOP in qualitative terms. Australia's ALOP, which reflects community expectations through government policy, is currently expressed as providing a high level of sanitary or phytosanitary protection aimed at reducing risk to a very low level, but not to zero. The band of cells in Table 8 marked 'very low risk' represents Australia's ALOP.

Stage 3: Pest Risk Management

Risk management describes the process of identifying and implementing measures to manage risks so as to achieve Australia's ALOP, while ensuring that any negative effects on trade are minimised.

To implement risk management appropriately, it is necessary to formalise the difference between 'unrestricted' and 'restricted' risk estimates. Unrestricted risk estimates are those derived in the absence of specific risk management measures, or following only baseline risk management procedures based on commercial production practices. By contrast, restricted or mitigated risk estimates are those derived when 'risk management' is applied.

The conclusions from pest risk assessment are used to decide whether risk management is required and if so, the strength of measures to be used. Where the unrestricted risk estimate exceeds Australia's ALOP, risk management measures are required to reduce this risk to a

very low level. Since zero-risk is not a reasonable option, the guiding principle for risk management is to manage risk to achieve the required degree of safety that can be justified and is feasible within the limits of available options and resources.

ISPM 11 provides details on the identification and selection of appropriate risk management options and notes that the choice of measures should be based on their effectiveness in reducing the probability of the introduction of the pest.

Examples given of measures commonly applied to traded commodities include:

- *Options for consignments* – e.g. inspection or testing for freedom from pests, prohibition of parts of the host, a pre-entry or post-entry quarantine system, specified conditions on preparation of the consignment, specified treatment of the consignment, restrictions on end use, distribution and periods of entry of the commodity.
- *Options preventing or reducing infestation in the crop* – e.g. treatment of the crop, restriction on the composition of a consignment so it is composed of plants belonging to resistant or less susceptible species, harvesting of plants at a certain age or specified time of the year, production in a certification scheme.
- *Options ensuring that the area, place or site of production or crop is free from the pest* – e.g. pest-free area, pest-free place of production or pest-free production site.
- *Options for other types of pathways* – e.g. consider natural spread, measures for human travellers and their baggage, cleaning or disinfestation of contaminated machinery.
- *Options within the importing country* – e.g. surveillance and eradication programs.
- *Prohibition of commodities* – e.g. if no satisfactory measure can be found.

Risk management measures were identified for each pest that is above the ALOP as required and are presented in the Pest Risk Management section of this document. The pests that are above the ALOP require the use of risk management measures in addition to the standard commercial practices. The recommended phytosanitary regulations based on these measures are presented in the Final Import Conditions section of this document.

5 PEST RISK ANALYSIS

5.1 Stage 1: Initiation

Initiation of this PRA followed market access requests for *P. bretschneideri* and *P. pyrifolia* from Shaanxi Province, *P.* sp. nr. *communis* from Xinjiang Uighur Autonomous Region and *P. pyrifolia* from Hebei Province into Australia received from the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) in March 2001, March 2003 and April and May 2004.

A list of pests likely to be associated with pears from China (i.e. the biosecurity risk pathway) was generated from information supplied by AQSIQ and literature and database searches. This list was used in this PRA.

In this PRA, the 'PRA area' is defined as Australia (excluding Western Australia) for the pests that do not occur in Australia. The 'endangered area' is defined as any area within Australia, where susceptible hosts are present and in which ecological factors favour the establishment of a pest that might be introduced in association with pears from China. The pathway in this PRA is considered to be fresh pear fruit for human consumption from export orchards in Hebei, Shandong and Shaanxi Provinces, and Xinjiang Uighur Autonomous Region of China.

5.2 Stage 2: Pest Risk Assessment

5.2.1 Pest categorisation

The quarantine pests of pears from China have been determined through a comparison of the pests recorded on pears in Hebei and Shandong previously assessed (AQIS, 1998; AFFA, 2003b), those recorded in Hebei, Shaanxi and Xinjiang Uighur Autonomous Region of China, and those known from Australia (Appendix 1A). Those pests which have not been assessed previously were examined for their presence or absence in Australia and presence on the fresh fruit pathway under consideration (Appendix 1B), and potential for establishment or spread and associated consequences (Appendix 1C). Pests that did not meet the definition of a quarantine pest were not considered further in the PRA.

Quarantine pests determined through the pest categorisation process are listed in Table 9. The list of quarantine pests of fresh pear fruit assessed in this report is similar to the list collated in earlier assessments for pear imports from China, except for one arthropod (*Rhynchites heros*) and two pathogens (*Alternaria yaliinficiens* and *Gymnosporangium sabinae*) of quarantine concern, which have not been previously considered. All other quarantine pests of pears have been assessed previously. These three pests require detailed risk assessment as they meet the IPPC criteria for a quarantine pest, specifically:

- the pest is known to be associated with pears in Hebei, Shandong, or Shaanxi Provinces or Xinjiang Uighur Autonomous Region of China;
- the pest is absent from Australia, or has a limited distribution and is under official control;
- the pest has the potential for being on the pathway;

- the pest has the potential for establishment or spread in the PRA area; and
- the pest has the potential for consequences.

Table 9: Quarantine pests of pears from Hebei, Shandong and Shaanxi Provinces and Xinjiang Uighur Autonomous Region in China. Species in bold text are not previously assessed

Pest Type	Common name
ARTHROPODS	
Acari (mites)	
Tetranychus viennensis Zacher	hawthorn spider mite
Coleoptera (beetles, weevils)	
Holotrichia parallela Motschulsky [Coleoptera: Scarabaeidae]	large black chafer
Holotrichia titanis Reitter [Coleoptera: Scarabaeidae]	brown chafer
Rhynchites coreanus Kono [Coleoptera: Rhynchitidae]	pear leaf weevil/curculio
Rhynchites foveipennis Fairmaire [Coleoptera: Rhynchitidae]	Korean pear weevil/curculio
Rhynchites heros Roelofs [Coleoptera: Rhynchitidae]	Japanese pear weevil
Diptera (flies)	
Bactrocera dorsalis (Hendel) [Diptera: Tephritidae]	Oriental fruit fly
Hemiptera (aphids, leafhoppers, mealybugs, psyllids, scales, true bugs, whiteflies)	
Cacopsylla pyrisuga (Förster) [Hemiptera: Psyllidae]	pear wood psylla
Dolycoris baccarum Linnaeus [Hemiptera: Pentatomidae]	sloe bug
Halyomorpha picus (Fabricius) [Hemiptera: Pentatomidae]	yellow-brown stink bug
Lopholeucaspis japonica (Cockerell) [Hemiptera: Diaspididae]	pear white scale
Pseudococcus comstocki (Kuwana) [Hemiptera: Pseudococcidae]	Comstock's mealybug
Sphanostigma iakusuiense (Kishida) [Hemiptera: Aphididae]	powdery pear aphid
Stephanitis nashi Esaki & Takeya [Hemiptera: Tingidae]	pear lace bug
Urochela luteovaria Distant [Hemiptera: Urostylidae]	pear stink bug
Hymenoptera (ants, wasps)	
Hoplocampa pyricola Rohwer [Hymenoptera: Tenthredinidae]	pear sawfly
Vespa mandarinia Smith [Hymenoptera: Vespidae]	paper wasp
Lepidoptera (moths, butterflies)	
Acleris fimbriana Thunberg [Lepidoptera: Tortricidae]	fruit tree tortrix
Acrobasis pyrivorella (Matsumura) [Lepidoptera: Pyralidae]	pear fruit moth
Acrocercops astaurota Meyrick [Lepidoptera: Gracillariidae]	pear bark miner
Adoxophyes orana (Fischer von Röeslerstamm) [Lepidoptera: Tortricidae]	summer fruit tortrix
Carposina sasakii Matsumura Lepidoptera: Carposinidae]	peach fruit borer
Choristoneura longicellana (Walsingham) [Lepidoptera: Tortricidae]	common apple leaf roller
Euzophera pyriella Yang [Lepidoptera: Pyralidae]	pyralid moth
Grapholitha inopinata Heinrich [Lepidoptera: Tortricidae]	Manchurian fruit moth
Leucoptera malifoliella Costa [Lepidoptera: Lyonetiidae]	pear leaf miner
Lymantria dispar Linnaeus [Lepidoptera: Lymantriidae]	gypsy moth
Pandemis heparana Denis & Schiffermüller [Lepidoptera: Tortricidae]	apple brown tortrix
Spilonota albicana (Motschulsky) [Lepidoptera: Tortricidae]	eye spotted bud moth
Spilonota lechriaspis Meyrick [Lepidoptera: Tortricidae]	tipshoot tortrix
Spilonota ocellana Fabricius [Lepidoptera: Tortricidae]	eye spotted bud moth
PATHOGENS	
Fungi	
Alternaria gaisen Nagano	black spot of Japanese pear
Alternaria yaliinficiens R. W. Roberts	chocolate spot of Ya pear

Pest Type	Common name
Gymnosporangium asiaticum Miyabe ex.G.Yamada	Japanese pear rust
Gymnosporangium sabinae (Dicks) G. Winter	European pear rust
Monilinia fructigena (Aderh. & Ruhl) Honey	brown rot
Phomopsis fukushii Tanaka & Eudo	Japanese pear canker
Physalospora piricola Nose	physalospora canker
Venturia nashicola Tanaka & Yamamoto	Japanese pear scab

5.2.2 Risk assessments for quarantine pests

A detailed risk assessment is presented in this PRA for *Rhynchites heros*, *Alternaria yaliinficiens* and *Gymnosporangium sabinae*. Each risk assessment involved the 'assessment of the probability of entry, establishment or spread' and 'assessment of consequences' as described in the Method for Pest Risk Analysis. The unrestricted risk posed by each quarantine pest was estimated by combining the probabilities of entry, of establishment and of spread with the estimate of associated potential consequences. The unrestricted risk estimates were then compared with Australia's ALOP to determine which quarantine pests presented an unacceptable level of risk and required risk mitigation options.

Probability estimates of entry, of establishment and of spread and potential consequences are supported by relevant biological information. Detailed information on each quarantine pest is provided in the data sheets in Appendix 2.

The risk assessments assumed standard cultivation, harvesting and packing activities in the commercial production of pears (e.g. in-field hygiene and management of pests, cleaning and hygiene during packing, and commercial quality control activities).

5.2.2.1 Arthropod pests

5.2.2.1.1 Japanese pear weevil

Weevils are characterised by having an elongated, downward-curving snout. Many weevils are serious pests of crops, seeds and plants. They vary in size from small seed weevils, less than 2 mm long, to the large pine weevils, 20-25 mm long. The larval stages are relatively featureless white or yellowish grubs, usually legless, but with a well-developed head and jaws. Adults and larvae of all species feed either on living or dead plant tissues. The larvae of many species feed inside the roots, stems or seeds of plants and some of these species can become serious pests of agricultural crops, garden plants and stored food products (Lawrence & Britton, 1991).

The weevil examined in this extension of existing policy is:

- *Rhynchites heros* Roelofs [Coleoptera: Rhynchitidae] – Japanese pear weevil.

Introduction and spread probability

Probability of importation

The likelihood that *R. heros* will arrive in the PRA area with the importation of fresh pear fruit from China: **Very low**.

- *R. heros* has been reported on pears in Hebei Province (Chao & Lee, 1966).

- *Rhynchites* weevils lay eggs in immature fruit, female weevils sever the stalk, causing the fruit to drop, allowing the larva to more easily enter the soil for pupation (Hanson, 1963). Therefore, ripe fruit will not contain eggs or larvae at the time of harvest.
- It is very unlikely that fresh pear fruit will harbour any life stages of *Rhynchites* weevils. The egg laying period can occur from April-June in Asia (USDA, 1958). Larvae develop in immature fruit that has fallen to the ground (Hanson, 1963) and adults die by the end of July (Hanson, 1963; INRA, 2004).
- Although some pears can be harvested in July, the likelihood that such fruit will harbour adults is very low, because numbers of adults will almost certainly have declined before fruit is harvested in August-September (AQSIQ, 2004).
- Fruit damaged by feeding of adult weevils exhibits visible symptoms on the surface. Damaged fruit can therefore be removed during packing house procedures
- Even if present on ripe fruit, adult weevils are relatively large (approximately 10 mm long), and would be easily noticed and removed from fruit during picking, sorting, packing and inspection procedures.
- Data from export pear orchard inspections by AQIS from 1999 to 2004 indicates that no *Rhynchites* spp. (including existing quarantine pest species) have been recorded on export pear fruit in Hebei and Shandong (AQIS, 2005).

Probability of distribution

The likelihood that *R. heros* will be distributed as a result of the processing, sale or disposal of fresh pear fruit from China, to the endangered area: **Low**.

- The fresh pear fruit commodity may be distributed throughout the PRA area for retail sale, as the intended use of the commodity is human consumption.
- Waste material would be generated. Larvae could survive in waste material as they can develop in decaying tissue (USDA, 1958).
- There is only one generation a year and larvae and adults can overwinter (USDA, 1958; Hanson, 1963) and may survive cold storage.
- Adults are flightless so movement of adults from fruit would be limited.

Probability of entry (importation x distribution)

The likelihood that *R. heros* will enter the PRA area as a result of trade in fresh pear fruit from China and be distributed in a viable state to the endangered area: **Very low**.

- The overall probability of entry is determined by combining the probabilities of importation and of distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 6).

Probability of establishment

Comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **Moderate**.

- *Rhynchites* weevils have a wide host range including *Pyrus* spp. (pears), *Prunus persicae* (peach), *Prunus* spp. (stone fruit), *Ficus carica* (fig), *Malus pumila* (apple), *Cydonia oblonga* (quince), *Eriobotrya japonica* (loquat) (USDA, 1958). These hosts are widely distributed in the PRA area.
- *Rhynchites* weevils are reported from Hebei (Chao & Lee, 1966), Szechuan and Chekiang (Hanson, 1963) in China, Japan (Lee & Morimoto, 1988; Yoshizawa, 1985) and Korea (Hanson, 1963; USDA, 1958). Similar environments occur in the PRA area.

- In China, mating is completed before the end of May (Hanson, 1963) and females lay 1-3 eggs in immature fruit (USDA, 1958).
- *Rhynchites* weevil females are able to produce 35-50 eggs over approximately 50 days (Hanson, 1963; USDA, 1958).
- Larvae feed on and develop within the fruit for 18-50 days (Hanson, 1963; USDA, 1958), but can also leave the fruit and feed on roots of weeds and decaying vegetables (USDA, 1958).
- Adults and larvae are capable of overwintering (USDA, 1958; Hanson, 1963), which enhances their ability to withstand unfavourable temperatures. However, the Australian climate would generally be suitable for *R. heros* to establish.
- Adults are nocturnal, live throughout summer and attack all available fruit and other parts of the tree (USDA, 1958).
- There is only one generation per year. The life cycle from egg to adult lasts approximately 132 days, and adults live for approximately 320 days (Hanson, 1963).
- Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not for all hosts. *Rhynchites* spp. can be effectively controlled with organophosphorus compounds (Lykouressis *et al.*, 2004).

Probability of spread

Comparative assessment of those factors in the area of origin and in the PRA area considered pertinent to the expansion of the geographical distribution of the pest: **Moderate**.

- The fruit crop hosts of the *Rhynchites* weevils are located in many parts of Australia.
- *Rhynchites* weevils may be spread as adults via infested host commodities or as larvae in soil or on products/machinery that carry soil.
- Similar environments (e.g. temperature, rainfall) occur both in China and Australia.
- The relevance of natural enemies in the PRA area is not known.
- *Rhynchites* weevils have limited natural dispersal mechanisms as adults cannot fly. Adults move from the soil to the canopy of host plants and when disturbed they drop to the ground.
- Natural barriers, such as arid areas, climate differences and long distances, exist between fruit-growing areas. The long distances between commercial host crops in Australia would make it difficult for the *R. heros* to disperse by natural spread.
- Weevils are subject to attack by an array of predators and parasitoids. Eggs are attacked by a mite (Hanson, 1963) and various Hymenoptera (i.e. Mymaridae, Pteromalidae) (Lawrence & Britton, 1991). Larvae are attacked by spiders and wasps (Lawrence & Britton, 1991) and a fungus (Hanson, 1963).

Probability of entry, establishment or spread

The overall likelihood that *R. heros* will enter the PRA area as a result of trade in fresh pear fruit from China, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within the PRA area: **Very low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of ‘rules’ for combining descriptive likelihoods (Table 6).

Consequences

Consideration of the direct and indirect consequences of *R. heros*: **Moderate**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — *Rhynchites* species attack several fruit trees and many other plants and require active management during the growing season. The larvae feed on the roots, young shoots and leaves and burrow into the fruit (Lykouressis *et al*., 2004). *Rhynchites heros* adults cause great damage by feeding on all parts of the plant. Females ovipositing on fruit cause considerable fruit drop from each tree (USDA, 1958; Hanson, 1963).
Any other aspects of the environment	**A** — There are no known direct consequences of *R. heros* for the natural environment, but their introduction into a new environment may lead to competition for resources with native species.
Indirect consequences	
Eradication, control etc.	**B** – Programs to suppress and control the weevil by insecticide applications, should it become established, would not add significantly to grower costs of crop production. Insecticides which would also control weevils are used to control existing insect pests in Australian pear orchards.
Domestic trade	**C** — The presence of *Rhynchites* weevils in commercial production areas may have a significant effect at the local level due to any resulting interstate trade restrictions on a wide range of commodities. These restrictions may lead to a loss of markets.
International trade	**D** — The presence of *Rhynchites* weevils in the commercial production areas of a range of commodities (apples, pears and stone fruits) may have a significant effect at the regional level due to any limitations to access to overseas markets where this pest is absent. These restrictions may lead to a loss of markets, which in turn would be likely to require industry adjustment. Various countries that import host commodities from China apply phytosanitary restrictions for this pest.
Environment	**A** – Additional measures to control *Rhynchites* weevils are unlikely to have additional effects on the environment, as insecticides such as synthetic pyrethroids are already registered for and used in pear orchards in Australia to control other weevil species.

Note: Refer to Table 7 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

Unrestricted risk estimate

The unrestricted risk estimate for *R. heros*, determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 8): **Very low**.

5.2.2.2 Pathogens

5.2.2.2.1 Chocolate spot of Ya Li pear

Several *Alternaria* species are known to infect apples and pears. *Alternaria yaliinficiens* identified as a new species differs from other *Alternaria* species (e.g. *A. alternata*, *A. gaisen*) genetically, anatomically and in its pattern of growth (Roberts, 2005). *Alternaria yaliinficiens* is one of several *Alternaria* species reported to occur on *Pyrus bretschneideri* fruit (Roberts, 2005).

The pathogen examined in this extension of existing policy is:

- *Alternaria yaliinficiens* R. G. Roberts – Chocolate spot of Ya-Li pear

Introduction and spread probability

Probability of importation

The likelihood that *A. yaliinficiens* will arrive in the PRA area with the importation of fresh pear fruit from China: **High**.

- *Alternaria yaliinficiens* is associated with Ya pears in Hebei and causes fruit lesions (Roberts, 2005).
- Stems of Ya pear fruit can also be affected by dark brown to black, shiny lesions, which lead to progressive collapse of the stem as the infection progresses towards the fruit (Roberts, 2005).
- Infected fruit may show symptoms (Roberts, 2005) and be detected during pre-export inspections but may also be symptomless. This pathogen is known to sporulate on fruit lesions (Roberts, 2005).
- *Alternaria yaliinficiens* can survive packing house procedures. Ya pear fruit infected by *Alternaria yaliinficiens* have been intercepted in the USA and Canada (Roberts, 2005).
- Interceptions of decayed Ya pear fruit showing symptoms of infection by *Alternaria* spp. have occurred in Australia, New Zealand, and the UK (Roberts, 2005).

Probability of distribution

The likelihood that *A. yaliinficiens* will be distributed to the endangered area as a result of the processing, sale or disposal of fresh pear fruit from China: **Moderate**.

- Fruit with undetectable levels of chocolate spot infections could escape pre-export and on-arrival detection and could survive storage (Roberts, 2005) and be distributed to wholesalers without causing any damage to fruit.
- The commodity is intended for human consumption and may be distributed throughout the PRA area for retail sale. Waste material would be generated.
- Discarded fruit waste containing this pathogen would be colonised rapidly by other saprophytic (feeding by external digestion of dead organic matter) microorganisms
- Stem end lesions are visible and dark brown to black in colour (Roberts, 2005), but they contrast less with the natural colour of the stem surface than fruit lesions do with the fruit surface. There is a strong possibility that such lesions will be missed during inspections.
- *Alternaria yaliinficiens* produces conidia on infected pear fruit after seven days (Roberts, 2005).
- *Alternaria* species can survive adverse conditions as chlamydospores in the soil. Under favourable conditions (warm and moist), masses of conidia are produced on leaf debris. Conidia are disseminated by wind and rain.

Probability of entry (importation x distribution)

The likelihood that *A. yaliinficiens* will enter the PRA area as a result of trade in fresh pear fruit from China and be distributed in a viable state to the endangered area: **Moderate**.

The overall probability of entry is determined by combining the probabilities of importation and distribution using the matrix of ‘rules’ for combining descriptive likelihoods (Table 6).

Probability of establishment

The likelihood that *A. yaliinficiens* will establish based on a comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **Moderate**.

- The known host range of *A. yaliinficiens* is restricted to Ya Li pears (*P. bretschneideri*) (Roberts, 2005).
- *Alternaria yaliinficiens* has been recorded only on Ya Li pears exported from Hebei Province in China (Roberts, 2005).
- *Pyrus bretschneideri* (including the variety Ya Li) is not widely grown though other species of pears including *P. pyrifolia* and *P. communis* are widely distributed throughout the PRA area, both in commercial orchard districts and suburban areas.
- The related species *Alternaria alternata* has a very wide host range that includes many plant families and a range of *Pyrus* and *Malus* species and is extremely widespread in most parts of the world.
- Many species and strains of *Alternaria* including *A. alternata* are already established in parts of Australia, indicating that suitable environments for its establishment would occur in the PRA area.
- *Alternaria gaisen*, the causal agent of black spot of Japanese pear, has a very limited host range (EPPO, 2005), and a limited host range may apply equally to *A. yaliinficiens*.
- *Alternaria* species can survive adverse conditions as chlamydospores in the soil. Under favourable conditions (warm and moist), masses of conidia are produced on leaf debris, and then are disseminated by wind and rain. Conidia landing on senescent floral parts can cause infection which is later on manifested in the fruit (Hsieh and Chiu, 1974).
- Diseases caused by *Alternaria* species on apple and pears are favoured by wet weather and high temperatures (25-30^{0}C).

Probability of spread

The likelihood that *A. yaliinficiens* will spread based on a comparative assessment of those factors in the source and destination areas considered pertinent to the expansion of the geographical distribution of the pest: **Low**.

- The known host range of *A. yaliinficiens* is restricted to Ya pear (*P. bretschneideri*) (Roberts, 2005) which has a very limited distribution. However, several other pear species and varieties are grown throughout Australia.
- Potential fruit crop hosts (*Pyrus* spp.) of *Alternaria* species are located in many parts of Australia. Natural barriers such as arid areas, climate differences and long distances exist between these areas. The long distances between commercial host crops in the PRA area would make it difficult for *Alternaria yaliinficiens* to disperse by natural spread.
- *Alternaria* species are spread primarily by means of conidia and their dispersal is favoured by rainfall. However, natural dispersal is only local and the possibility of long-distance dispersion is limited. Dormant planting material (without leaves) is not known to carry *Alternaria*.
- *Alternaria* species can survive adverse conditions as chlamydospores in the soil. Under favourable conditions (warm and moist), masses of conidia are produced on leaf debris, from which they are disseminated by wind and rain.

Probability of entry, establishment or spread

The overall likelihood that *Alternaria yaliinficiens* will enter the PRA area as a result of trade in fresh pear fruit from China, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within the PRA area: **Very low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 6).

Consequences

Consideration of the direct and indirect consequences of *Alternaria yaliinficiens*: **Moderate**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — *A. yaliinficiens* affects fruit cortex and stems of Ya pears (Roberts, 2005). The potential for *A. yaliinficiens* to infect other plants is present, because a closely related species, *A. alternata*, infects a very large number of fruit and vegetable crops, causing spots on all parts of the plant and defoliation in severe infestations (CSL, 2000; CAB International, 2004).
Any other aspects of the environment	**A** — There are no known direct consequences of *A. yaliinficiens* for the natural or built environment.
Indirect consequences	
Eradication, control, etc.	**B** — No research on the specific control of *A. yaliinficiens* exists. However, existing control measures for other *Alternaria* species, such as fungicides (Tang, 1994) are likely to be effective for controlling *A. yaliinficiens.* Modifying these control programs would not add significantly to growers' costs of crop production.
Domestic trade	**C** — The presence of *A. yaliinficiens* in commercial production areas may have a significant effect at the local level due to any resulting interstate trade restrictions on a wide range of commodities. These restrictions may lead to a loss of markets.
International trade	**D** — The presence of *A. yaliinficiens* in the commercial production areas of a range of commodities (pears) may have a significant effect at the regional level due to any limitations to access to overseas markets where this pest is absent. Fifteen percent of Australia's pears are currently exported (FAS, 2002b). Export may decrease if other countries suspend or restrict importation of pears from Australia due to the presence of *A. yaliinficiens*. Various countries that import host commodities from China apply phytosanitary restrictions for this pathogen. For example, the USA suspended imports of Ya pears from China in March 2002 and December 2003 due to the interception of *A. yaliinficiens* on the fruit (Roberts, 2005). Loss of markets would be likely to require industry adjustment.
Environment	**A** – Additional measures to control *A. yaliinficiens* are unlikely to have additional effects on the environment.

Note: Refer to Table 7 (The assessment of local, district, regional and national consequences and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

Unrestricted risk estimate

The unrestricted risk estimate for *A. yaliinficiens*, determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 8): **Very low**.

5.2.2.2.2 European pear rust

Species of *Gymnosporangium*, including *G. asiaticum, G. sabinae, G. globosum, G. kernianum, G. libocedri* and *G. nelsoni* have been reported to cause rust diseases of pears (Aldwinckle, 1990a). Most *Gymnosporangium* species require a *Juniperus* species as an alternate host. Both the geographic range and economic importance of the diseases caused are limited, even within a given fruit-growing region, by the distribution of an alternate host. *Gymnosporangium* species differ in the complexity of their life cycles and in their effects on leaves and or fruits (Aldwinckle, 1990a).

The pathogen examined in this extension of existing policy is:

- *Gymnosporangium sabinae* (Dicks) G. Winter – European pear rust

Introduction and spread probability

Probability of importation

The likelihood that *G. sabinae* will arrive in the PRA area with the importation of fresh pear fruit from China: **Low**.

- *Gymnosporangium sabinae* has only been recorded in a pear orchard in South Wutai Mountain, Shaanxi Province (Wang & Guo, 1985). However, there have been no records of *G. sabinae* from Shaanxi since 1985 (AQSIQ, 2005) and it is not recorded elsewhere in China.
- The fungus requires an alternate host (*Juniperus*) to complete its life cycle (Aldwinckle, 1990a) and these hosts are removed from orchard areas for *Gymnosporangium asiaticum* (AQSIQ, 2004).
- Both leaves and fruit can become infected and young infected fruit may become mummified (Aldwinckle, 1990c) and abort before maturity.
- Pears are harvested in Shaanxi between mid-August and the end of September. This coincides with peak rainfall in Shaanxi and when daily minimum and maximum temperatures range from 20.5 to 31°C in August, and 15.5 to 25 C in September. These conditions indicate that germinating teliospores (Hilber *et al.*, 1990) may be present in orchards during harvest.
- Symptomless fruit could be harvested; however, mature pear fruit is more resistant to infection by basidiospores.
- Fruit exhibiting symptoms of European pear rust would be rejected during harvesting and routine grading and sorting operations.

Probability of distribution

The likelihood that *G. sabinae* will be distributed to the endangered area as a result of the processing, sale or disposal of fresh pear fruit from China: **Moderate**.

- The commodity is intended for human consumption and may be distributed throughout the PRA area for retail sale. Waste material would be generated.
- Temperatures and humidity in some parts of Australia are suitable for the pathogen's survival. For survival to occur, the thin-walled basidiospores will need to persist in a viable state on the pear fruit surface for an extended period.
- Basidiospores are unlikely to survive on fruit stored at low temperatures. Those that do so will germinate only if a thin film of water is present on the fruit surface and in temperatures between 5 and 25°C (Hilber *et al.*, 1990; Aldwinckle, 1990b).

- The fungus requires an alternate host to complete its life cycle (Aldwinckle, 1990a). Therefore, spores from the discarded pear fruit must disperse to their alternate host (*Juniperus*) to complete their life cycle.

Probability of entry (importation x **distribution)**

The likelihood that *G. sabinae* will enter the PRA area as a result of trade in fresh pear fruit from China and be distributed in a viable state to the endangered area: **Low**.

The overall probability of entry is determined by combining the probabilities of importation and distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 6).

Probability of establishment

The likelihood that *G. sabinae* will establish based on a comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **Moderate**.

- *Gymnosporangium sabinae* has a restricted host range including pear and *Juniperus* (Aldwinckle, 1990c; CAB International, 2004). *G. sabinae* is a rust fungus that passes different stages of its life history on different hosts; it requires *Juniperus* species and members of the Rosaceae (mainly *Pyrus* species) to complete its life cycle (CAB International, 2005).
- Natural hosts, including apple and pears, are widely distributed in the PRA area, both in commercial orchard districts and suburban areas.
- *Gymnosporangium sabinae* is established in Algeria, Belgium, Canada, China (Shaanxi), Denmark, Lebanon, Morocco, Netherlands, Norway, Syria, Sweden, Turkey, UK, and USA (Alabama, California) (CAB International, 2004). Environments similar to these areas exist in various parts of Australia.
- The temperature range for germination of basidiospores of *G. sabinae* in experiments was 5-25ºC with an optimum of 20°C (Hilber *et al*., 1990). These temperatures are found across the pear growing regions of temperate Australia for much of the year.
- No infection of *G. sabinae* was reported at temperatures above 25^{o}C (Hilber *et al*, 1990). Therefore, establishment of *G sabinae* in Australia would most likely occur only in southern areas of the country.
- *Gymnosporangium sabinae* is managed and controlled by application of protective fungicide prior to spore release (Aldwinckle, 1990c). Mancozeb (Vukovits, 1979) and other fungicides used to treat other fungal pathogens in pear orchards in Australia are also effective against European pear rust.

Probability of spread

The likelihood that *G. sabinae* will spread based on a comparative assessment of those factors in the source and destination areas considered pertinent to the expansion of the geographical distribution of the pest: **Moderate**.

- *Gymnosporangium sabinae* is a serious pest of pears in Europe, Asia and North Africa (Aldwinckle, 1990c), and it tolerates a wide range of climates.
- Natural hosts, including susceptible apple and pears, are widely distributed in Australia, both in commercial orchard districts and suburban areas.
- The long distances between the main apple and pear districts in Australia would make it difficult for this fungus to disperse naturally from one district to another.

- Spores of *G. sabinae* often form on leaves, stems and fruits, and can be carried on fruit, stems and leaves of infected plants during trade and transport (CAB International, 2004).
- Under natural conditions basidiospores and aeciospores are dispersed by wind (CAB International, 2004). Wind dispersal will promote rapid spread of this pathogen.
- Aeciospores can remain dormant throughout winter (Vukovits, 1979) for up to five to six months (Dinc & Karaca, 1975). Germination occurs in early spring. Dormancy enhances temperature tolerance and promotes establishment and spread of *G. sabinae*.
- One study showed that the incidence of *G. sabinae* on pear was related to the distance from juniper plants, obstacles, wind direction and susceptibility of the pear variety (Dinc & Karaca, 1975).
- Spread by humans could occur by transporting infected juniper stems or by transporting infected pear planting material.
- The climates of China and Australia are similar in many areas.

Probability of entry, establishment or spread

The overall likelihood that *G. sabinae* will enter the PRA area as a result of trade in fresh pear fruit from China, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within the PRA area: **Low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 6).

Consequences

Consideration of the direct and indirect consequences of *G. sabinae*: **Moderate**.

Criterion	Estimate
Direct consequences	
Plant life or health	**D** – *G. sabinae* is considered a serious disease of pears in Europe, parts of Asia and North Africa (Aldwinckle, 1990c). *G. sabinae* has also been designated the most important pear rust in Europe (CMI, 1977). In western North America, *G. sabinae* was more damaging than in Europe (CAB International, 2004). Infection of young fruit causes fruit drop and a reduction in pear fruit yield. *G. sabinae* infects leaves and stems of juniper, and leaves, stems and immature fruit of pears (CAB International, 2004; Laundon, 1977). The incidence of infection of *G. sabinae* on pears in Turkey varied from 4 to 100% in one study, with subsequent yield losses of 9 to 100% (Dinc & Karaca, 1975).
Any other aspects of the environment	**B** – Unlikely to affect native flora because its host range is restricted mainly to *Pyrus* (pear) species (Rosaceae) and *Juniperus* spp. (Cupressaceae) (CAB International, 2004). *G. sabinae* would be detrimental to ornamental *Juniperus* spp.
Indirect consequences	
Eradication, control, etc.	**C** – Programs to monitor and eradicate *G. sabinae*, should it reach Australia, would be costly. Programs to suppress and control the disease by fungicide applications, should it become established, would not add significantly to grower costs of crop production, as Mancozeb is already used to control other pear fungal diseases in Australia. The fungicides triforine and ziram are also effective in controlling this pathogen (Mijuskovic, 1979).
Domestic trade	**B** – Presence of *G. sabinae* in commercial production areas would result in the implementation of interstate quarantine measures. Current interstate measures prohibit movement of pears into Western Australia.

Criterion	Estimate
International trade	**C** – *G. sabinae* is of quarantine concern on *Pyrus* and *Juniperus* species in Europe. Its presence in pear production areas of Australia would have negative impacts on international trade; particularly for Australia's fresh pear export industry.
Environment	**B** – Additional measures to control *G. sabinae* are unlikely to have additional effects on the environment, as Mancozeb is already registered for and used in pear orchards in Australia.

Note: Refer to Table 7 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

Unrestricted risk estimate

The unrestricted risk estimate for *G. sabinae*, determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 8): **Low**.

5.2.3 Risk assessment conclusion

Table 10 summarises the detailed risk assessments and provides unrestricted risk estimates for the quarantine pests considered to be associated with pears from China. European pear rust (*Gymnosporangium sabinae*) was assessed to have an unrestricted risk of 'low', which does not meet Australia's ALOP. Risk management measures are therefore required. Japanese pear weevil (*Rhynchites heros)* and chocolate spot of Ya Li pear (*Alternaria yaliinficiens)* were assessed to have an unrestricted risk of 'very low', and therefore they do not require the application of any specific phytosanitary measures in order to maintain Australia's ALOP.

Table 10: Unrestricted risk summary

Pest name	Probability of					Overall probability of entry, of establishment and of spread	Consequences	Unrestricted Risk
	Entry			Establishment	Spread			
	Importation	Distribution	Overall probability of entry					
ARTHOPODS								
Japanese pear weevil	Very low	Low	Very low	Moderate	Moderate	Very low	Moderate	Very low
PATHOGENS								
chocolate spot of Ya Li pear	High	Moderate	Moderate	Moderate	Low	Very low	Moderate	Very low
European pear rust	Low	Moderate	Low	Moderate	Moderate	Low	Moderate	**Low**

5.3 Stage 3: Pest Risk Management

Pest risk management evaluates and selects measures to reduce the risk of entry, establishment or spread of quarantine pests with an unrestricted risk estimate that does not meet Australia's ALOP. In this case, risks are due to the importation of commercially produced pears from China, i.e. fruit from commercial production sites and subjected to standard cultivation, harvesting and packing activities.

Unrestricted risk estimates should take into account only the minimum border procedures used by relevant government agencies and not measures intended to mitigate risks associated with the commodity itself. The minimum procedures include verifying that the commodity is as described in the shipping documents and identifying external and internal contaminations of containers and packaging.

Biosecurity Australia considers that the risk management measures described in this document will provide an appropriate level of protection against the pests identified in the risk assessment.

5.3.1 Risk management measures and phytosanitary procedures

Australia currently permits the importation of the following pear species from China:

- *P. bretschneideri* (Hebei and Shandong Provinces only);
- *P. pyrifolia* (Shandong Province only)
- *P. ussuriensis* (Shandong Province only)

Such importation can, however, only occur if the following risk management measurtes and phytosanitary procedures are followed:

- monitoring system for Oriental fruit fly;
- a systems approach for arthropod pests;
- a systems approach for pathogens; and
- operational systems for the maintenance and verification of the phytosanitary status of pears.

This pest risk assessment has been focused on the possible importation of:

- *P. bretschneideri* (Shaanxi Province);
- *P. pyrifolia* (Hebei and Shaanxi Provinces);
- *P. ussuriensis* (Hebei and Shaanxi Provinces); and
- *P. sp.nr.communis* (Xinjiang Uighur Autonomous Region only).

The risk assessment indicated that for the new quarantine pests associated with the pear species and provinces outlined above, only European pear rust (*Gymnosporangium sabinae*) was assessed to have an unrestricted risk estimate that did not meet Australia's ALOP. As such, risk management measures are required for this pest. These specific measures will be contained within the existing systems approach for pathogens, as well as the more general operational system.

In order to ensure clarity of the risk management measures and phytosanitary procedures that are to be imposed to mitigate the risks associated with the importation of the identified species of pears from the Chinese provinces in question, the full range of risk management measures and phyutosanitray procedures are set out below.

Final import conditions are described in Section 6.

5.3.1.1 Monitoring system for oriental fruit fly

Oriental fruit fly (*Bactrocera dorsalis*) was assessed in the import risk analysis (IRA) for the importation of Ya pear (*Pyrus bretschneideri*) from Hebei and Shandong Provinces to have an unrestricted risk estimate that does not meet Australia's ALOP (AQIS, 1998). Measures are therefore required to manage this risk.

Visual inspection of fruit alone is not considered to be an appropriate risk management measure because external signs of infestation (particularly in recently infested fruit) may not be visible. If infested fruit is not detected at inspection, Oriental fruit fly may enter, establish or spread in Australia.

Consistent with previously established measures for Ya pears (AQIS, 1998), AQSIQ must implement a fruit fly monitoring program for the additional regions of Shaanxi and Xinjiang as well as continuing the fruit fly monitoring program already being undertaken in Hebei and Shandong Provinces. Additionally, a minimum of one methyl eugenol trap should be placed in each export orchard and in villages present in the fruit fly area. Summary data including number and location of traps, data on trap catches, and species caught for all fruit fly traps (cue lure, trimedlure and methyl eugenol) is to be made available to the AQIS pre-clearance inspector.

AQSIQ will notify Biosecurity Australia of the detection of any fruit fly species of economic importance within 48 hours. AQIS will assess the species and number of individual flies detected and the circumstances of the detection. AQIS will advise AQSIQ of action to be taken. If fruit flies are detected at pre-clearance inspection, trade will stop immediately pending the outcome of an investigation.

5.3.1.2 Systems approach for arthropod pests

Acrobasis pyrivorella (pear fruit moth), *Adoxophyes orana* (summer fruit tortrix), *Sphanostigma iakusuiense* (powdery pear aphid), *Cacopsylla pyrisuga* (pear wood psylla), *Carposina sasakii* (peach fruit borer), *Cydia inopinata* (Manchurian fruit moth); *Euzophera pyriella* (moth), *Lymantria dispar* (gypsy moth), *Pseudococcus comstocki* (Comstock mealybug), *Rhynchites coreanus* (pear leaf weevil) and *Tetranychus viennensis* (hawthorn red spider mite) were assessed in the IRA for the importation of *Pyrus bretschneideri* pears from Hebei and Shandong Provinces (AQIS, 1998). All species had an unrestricted risk that did not meet Australia's ALOP. Measures were therefore required to manage these risks.

Biosecurity Australia has identified the following systems approach based on orchard inspection and surveillance to reduce the risk associated with arthropods to a very low level.

Orchard control

Registered growers must implement an orchard control program (i.e. good agricultural practice/integrated pest management (IPM) programs for export pears). Programs must be approved by AQSIQ, incorporate field sanitation and appropriate pesticide applications for the management of arthropod pests. AQSIQ will be responsible for ensuring that export growers are aware of pests of quarantine concern to Australia, field sanitation and control measures. Registered growers must keep records of control measures for auditing. Details of the pest control program must be provided to DAFF by AQSIQ before trade commences. If there is any change to the pest control program AQSIQ must provide a revised copy of the pest management program to the AQIS pre-clearance inspector. Orchard control for these pests must include:

- Detection/monitoring surveys by AQSIQ, to verify the effectiveness of the orchard control measures for these pests.
- Immediate notification by AQSIQ if any pest of potential quarantine concern to Australia is detected, to ensure that Biosecurity Australia/AQIS can take appropriate action.

5.3.1.3 Systems approach for pathogens

Alternaria gaisen (black spot of Japanese pear), *Gymnosporangium asiaticum (*Japanese pear rust), *Monilinia fructigena* (brown rot), *Phomopsis fukushii* (Japanese pear canker), *Physalospora piricola* (physalospora canker) and *Venturia nashicola* (Japanese pear scab) were assessed in the IRA for the importation of Ya pear (*Pyrus bretschneideri*) from Hebei and Shandong Provinces (AQIS, 1998). All species had an unrestricted risk that did not meet Australia's ALOP. Measures were therefore required to manage the risk.

The unrestricted risk of European pear rust (*Gymnosporangium sabinae*) has been assessed to have an unrestricted risk estimate of low and measures are therefore required to manage this risk.

Visual inspection of fruit alone is not considered to be an appropriate risk management option for all the pathogens as external signs of infection are not always present. If infected fruit was exported to Australia, these pathogens may enter, establish or spread in Australia.

AQSIQ has not proposed pest free areas in Hebei, Shandong, and Shaanxi as a risk management measure for these pathogens.

To reduce the risk associated with pathogens to a very low level, Biosecurity Australia has identified the following systems approach, based on orchard inspection and surveillance.

Orchard control

The objective of this measure is to reduce to a very low level the risk that pear fruit for export to Australia from China is infected by these pathogens. Registered growers must implement an orchard control program (i.e. good agricultural practice and disease management programs for export pears). Programs must be approved by AQSIQ, and incorporate field sanitation and appropriate fungicide applications for the management of pathogens of quarantine concern to Australia. Orchard control for these pathogens must include:

- An orchard disease survey by AQSIQ, to check for the absence of these pathogens and to verify the effectiveness of the orchard control measures for these pathogens;

- Removal of the telial hosts (*Juniperus chinensis, J. procumbens*) of Japanese pear rust (*Gymnosporangium asiaticum*) and European pear rust (*Gymnosporangium sabinae*) within 2 km of registered orchards. If either Japanese pear rust or European pear rust is found, fruit from the export orchards within 2 km of the infected site will not be accepted into Australia;
- Bags must be placed over individual fruit of *P. bretschneideri*, *P. pyrifolia* and *P. ussuriensis* pear fruit grown in Shandong, Shaanxi and Hebei when the fruit is no more than 2.5 cm in diameter. Fruit must be protected by bags to minimise the risk of exposure to pear fruit moth and the diseases of brown rot, black spot, pear scab and physalospora canker. *Pyrus* sp. nr. *communis* pears in Xinjiang Uighur Autonomous Region are not commonly bagged (AQSIQ, 2004), because these pests have not been recorded in that area. Furthermore, bagging would affect ripening of *Pyrus* sp. Nr. *communis* pears, which require sun exposure during the ripening process to produce a blush of colour characteristic of this species.

AQSIQ must inspect all export orchards for pests of concern.

- If brown rot (*Monilinia fructigena*) is detected in any designated export area, fruit from that export area will not be permitted entry into Australia.
- Orchards infected with Japanese pear scab (*Venturia nashicola*) will not be permitted to export fruit.
- If orchard inspections show that more than 0.5% of fruit are infected with black spot (*Alternaria gaisen*) at the time of blossoming, those orchards will be excluded from the export program.

5.3.1.4 Operational systems for the maintenance and verification of phytosanitary status

A system of operational procedures is needed to maintain and verify the phytosanitary status of pears from China during the process of production and export to Australia. Biosecurity Australia recommends that a system equivalent to the systems currently in place for the importation of pears from Hebei and Shandong be applied to all the designated species and regions.

The system of operational procedures for the production and export of pears from China to Australia will include:

- registration of export orchards;
- registration of packing houses and auditing of procedures;
- packaging and labelling;
- specific conditions for storage and movement of produce;
- pre-export phytosanitary inspection by AQIS/CIQ;
- phytosanitary certification by CIQ; and
- on-arrival document compliance examination by AQIS.

5.3.1.4a Registration of export orchards

All pears exported from China must be sourced from registered export orchards. Copies of the registration records must be available for audit by AQIS if requested. AQSIQ will be required to register each export orchard prior to commencement of exports from that orchard.

The hygiene of export orchards must be maintained by appropriate pest management options that have been approved by AQSIQ, to manage pests and diseases of quarantine concern to Australia. Registered growers must keep records of control measures for auditing. If required, the details of the pest control program will be submitted to Biosecurity Australia/AQIS through AQSIQ.

This procedure ensures that orchards from which pears are sourced can be identified. This is to allow trace-back to individual orchards in the event of non-compliance. For example, if live pests are intercepted during pre-clearance inspection, identification of a specific orchard will allow investigation and corrective action to be targeted rather than applying to all contributing orchards.

5.3.1.4b Registration of packing houses and auditing of procedures

All packing houses intending to export fruit to Australia will be required to be registered with AQSIQ for trace-back purposes.

Packing houses will be required to use a unique system to identify individual orchards and identify fruit from these orchards. Cartons or pallets (each containing fruit from one orchard only) will be marked with a unique orchard number.

5.3.1.4c Packaging and labelling

All pear fruit for export must be free from regulated articles[1] and pests of quarantine concern to Australia. No unprocessed packing material of plant origin will be allowed. All wood material used in packaging of pears must comply with the AQIS conditions, as set out in 'Cargo containers: quarantine aspects and procedures' (http://www.aqis.gov.au/ICON).

All cartons must be labelled with the orchard registration number. Product in pallets must be identified by attaching a uniquely numbered pallet card to each pallet or part pallet to enable trace-back to registered orchards.

The objectives of this procedure are to ensure that:

- pear fruit exported to Australia are not contaminated by regulated articles and pests of quarantine concern to Australia; and
- unprocessed packing material is not imported with pear fruit.

5.3.1.4d Specific conditions for storage and movement

Product and its packaging are to be protected from pest contamination during and after packing, during storage and transport between locations (that is, from packing house to cool storage/depot, to inspection point, to export point).

Product for export to Australia that has been inspected and certified by AQIS/CIQ must be maintained in secure conditions that will prevent mixing with fruit for domestic consumption or export to other destinations.

Security of the consignment is to be maintained until arrival in Australia.

[1] The IPPC defines a regulated article as 'any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved'.

This procedure ensures that the phytosanitary status of the product is maintained during storage and movement.

For transportation, packaged fruit must be transported it must be secured using one of the following methods:

1. fruit must be packed and directly transferred into a shipping container, which must be sealed with a AQSIQ seal and not opened until the container reaches its destination; or
2. fruit must be packed into cartons with screened ventilation holes; the screening mesh size must not exceed 1.6 mm and not less than 0.16 mm strand thickness; or
3. fruit must be packed into cartons and the pallet of cartons must be shrink-wrapped in plastic on all six sides.

All cartons must be marked (1) 'For Australia', (2) with a lot number, (3) with orchard registration numbers, (4) with packing house numbers, (5) with the number of cartons per lot, and (6) with the date. Alternatively, for palletised "integral" consignments which have been strapped and secured, the information marked on the cartons must also be provided on a pallet card.

AQSIQ must ensure that records are properly maintained to facilitate auditing of fruit during or after storage, and that container doors are sealed after loading.

5.3.1.4e Pre-clearance phytosanitary inspection by AQIS/CIQ

AQIS and CIQ will jointly inspect all consignments in accordance with AQIS procedures for all visually-detectable quarantine pests and regulated articles. The AQIS sampling protocol requires inspection of 600 units for quarantine pests, in systematically selected samples per homogeneous consignment[2] or lot[3]. For pears, AQIS defines a unit as one fruit.

Where a quarantine pest is intercepted in a sample, the remedial actions or treatments may (depending on the location of the inspection) include withdrawal of the consignment from export to Australia; or treatment of the consignment and re-inspection to ensure that the pest is no longer viable.

It should be emphasised that inspection is not a measure that mitigates the risk of a pest. It is the subsequent remedial actions or treatments that would reduce a pest risk.

Action must be taken on all quarantine pests detected and CIQ technical specialists, or their nominated agents, will identify all pests to species level and forward this information to AQIS. Duplicate specimens of detected pests, if available, must be given to the AQIS inspector at the time of pre-clearance. Exports will not be permitted until the identification to species level is completed and information is sent to AQIS for approval.

If live pests are found, confirmation of their identity to species level is required. If the organism is identified as a quarantine pest, then the following action must be taken:

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[2] A consignment is the number of boxes of fresh pears from China covered by one phytosanitary certificate shipped via one port in China to a designated port in Australia for one consignee on the same vessel on the same day.

[3] An inspection lot is the number of boxes presented for a single phytosanitary inspection.

- if it is a quarantine pest for which in-field risk management measures are not required, then the exporter/grower will be given the option of re-conditioning the affected fruit in the entire lot and the lot will be subsequently re-inspected; or
- if it is a quarantine pest for which in-field risk management measures are required (refer 5.3.1.2 and 5.3.1.3) but have not been effective, then the entire lot will be rejected; or
- if the pest cannot be identified, then the entire lot will be rejected.

A registered orchard which has one rejection will be permitted to submit further lots for the remainder of the season. However, if a second rejection occurs during the same season, then that orchard must be withdrawn from the Australian program.

If physalospora canker is found, then all fruit from orchards whose fruit comprised that lot will be rejected.

5.3.1.4f Phytosanitary certification by CIQ

CIQ will issue a Master Phytosanitary Certificate for all pre-export inspected lots. The master phytosanitary certificate will record details of all inspected lots that have passed inspection and are cleared by AQIS for export to Australia. The objective of this procedure is to provide formal documentation to AQIS verifying that the relevant offshore measures have been undertaken. To be consistent with International Standards for Phytosanitary Measures No. 7 *Export Certification Systems* (FAO, 1997), each master phytosanitary certificate is to contain the following additional declaration:

'Produced and inspected under the pear arrangement between AQSIQ and DAFF'

After the AQIS inspector leaves:

- For each shipment a new Phytosanitary Certificate, specifying the lots covered by it, cartons per lot and the container and seal number must be issued by CIQ; and
- Attached to this Phytosanitary Certificate must be a copy of the Master Phytosanitary Certificate jointly signed by CIQ and the AQIS pre-clearance inspector during pre-clearance.

5.3.1.4g On-arrival quarantine clearance by AQIS

Consignments inspected by AQIS under pre-clearance arrangements do not require on-arrival inspection by AQIS in Australia. AQIS will examine documents for compliance and consignment verification prior to release of the consignment from quarantine. This procedure verifies that the required measures have been undertaken.

5.3.2 Action for non-complying lots

Where inspection lots are found to be non-compliant, remedial action must be taken. Where a quarantine pest is intercepted, the remedial actions or treatments may (depending on the location of the inspection) include:

- withdrawal of the consignment from export to Australia;
- re-export of the consignment from Australia;
- destruction of the consignment; or

- treatment of the consignment and re-inspection to ensure that the pest is no longer viable.

If product continually fails inspection, Biosecurity Australia/AQIS reserves the right to suspend the export program and conduct an audit of the pear risk management systems in China. The program will recommence only when Biosecurity Australia/AQIS is satisfied that appropriate corrective action has been taken.

5.3.3 Uncategorised pests

If an organism that has not been categorised is detected on pears from China, it will require assessment to determine its quarantine status and if phytosanitary action is required. The detection of any pests of quarantine concern that have not already been identified in the analysis may result in the suspension of trade while a review is conducted to ensure that the existing measures continue to meet Australia's ALOP.

6 FINAL IMPORT CONDITIONS

Biosecurity Australia recommends revised phytosanitary conditions to address the risks posed by the quarantine pests identified on pears from China.

The components of the final import conditions incorporated into the Import Protocol are summarised below:

- permitted pear species and regions;
- registration of export orchards;
- registration of packing houses and auditing of procedures;
- orchard control program and general surveillance;
- fruit fly monitoring;
- inspection of orchards;
- notification of unusual weather conditions;
- pre-harvest inspection;
- bagging of fruit and storage;
- packing and labelling;
- specific conditions for storage and movement of produce;
- pre-clearance inspection and remedial action;
- phytosanitary certification;
- on-arrival quarantine clearance by AQIS;
- confirmation of current prohibition of importation of pear fruit into Western Australia;
- visits by AQIS; and
- review of protocol.

6.1 Import protocol

The protocol is based on the import conditions for *Pyrus bretschneideri* pear fruit from China to Australia (AQIS, 1998) as amended in January 2003 (Appendix 3), with additional changes as noted in this document.

Import protocol for pear fruit from the People's Republic of China to Australia (October 2005)

Item 1. Permitted pear species and regions

This import protocol covers the following pear species grown in the specified regions of China:

1. *Pyrus bretschneideri* from Hebei, Shaanxi and Shandong Provinces.
2. *Pyrus pyrifolia* from Hebei, Shaanxi and Shandong Provinces.
3. *Pyrus ussuriensis* from Hebei, Shaanxi and Shandong Provinces
4. *Pyrus* sp. nr. *communis* from Xinjiang Uighur Autonomous Region.

Representatives from Biosecurity Australia will return when necessary to China for further extension visits; for example, to assess risks posed by quarantine pests.

Item 2. Registration of export orchards

Fruit of *Pyrus bretschneideri*, *P. pyrifolia*, *P. ussuriensis* and *P.* sp. nr. *communis* for export to Australia must be sourced from AQSIQ registered orchards in the designated export areas. Copies of the registration records must be made available to AQIS on request. Registration by AQSIQ is required to enable trace-back in the event of non-compliance.

All export orchards are expected to produce pears under China's commercial cultivation, harvesting and packing practices.

Item 3. Registration of packing houses and auditing of procedures

All packing houses must be registered by AQSIQ. Packing houses must be situated within the area subject to a fruit fly monitoring (trapping) program. All packing houses intending to export permitted pears to Australia must be registered with AQSIQ, for trace-back purposes.

Packing houses must identify individual orchards with a numbering system to enable trace back in the case of non-compliance. The packing house and packing area must be well-lit, and the storage areas must be secure to prevent infestation after packing. Packing procedures must ensure that pears are free of pests of concern to Australia and regulated articles.

AQSIQ must ensure that fruit destined for Australia is not mixed with fruit for other destinations. The identity and origin of the fruit for export must be maintained throughout the process. During packing of fruit for export to Australia, no fruit for the domestic market is to be packed at the same time.

If movement of fruit is required from orchard to packing house through an unmonitored area, the fruit must remain within intact bags and be covered by a tarpaulin.

Culled fruit must be removed from the packing house at the end of each day. AQIS and/or AQSIQ may further examine culled fruit for pests.

The list of registered packing houses must be kept by AQSIQ and provided to AQIS prior to exports commencing. Updates must be provided if packing houses are added or removed from the list.

Item 4. Orchard control program and general surveillance

Registered growers must implement an orchard control program (i.e. good agricultural practice/integrated pest management (IPM) programs for export pears) that has been approved by AQSIQ. Programs must incorporate field sanitation and appropriate pesticide/fungicide applications for the in-field risk management of pests and diseases of quarantine concern to Australia, as indicated in bold text in **Attachment 1** of this protocol.

AQSIQ will be responsible for ensuring that growers are aware of pests of quarantine concern to Australia, and that export orchards are subject to field sanitation and control measures against these pests. Registered growers must keep records of control measures for auditing. Details of the pest control program must be provided to DAFF by AQSIQ before commencement of trade. AQSIQ must provide a revised copy of the pest management program to the AQIS pre-clearance inspector if there is any change to the pest control program.

Detection/monitoring surveys for pests and diseases that require in-field management measures must be conducted regularly by AQSIQ in orchards registered for export within the designated areas. AQSIQ will report annual survey results to DAFF using a standard reporting format.

AQSIQ must ensure that telial hosts (*Juniperus chinensis, J. procumbens*) of Japanese pear rust (*Gymnosporangium asiaticum*) and European pear rust (*G. sabinae*) occurring within 2 km of registered orchards are removed. If either Japanese pear rust or European pear rust is found, fruit from the export orchards within 2 km of the infected site will not be accepted into Australia.

Biosecurity Australia and AQIS must be notified immediately of other pests and diseases discovered by AQSIQ during surveys and not previously categorised by Biosecurity Australia. If any other exotic pest or disease of known quarantine concern to Australia, for example fire blight (*Erwinia amylovora*) is detected, then Biosecurity Australia and AQIS must be notified immediately for appropriate action to be taken.

Item 5. Fruit fly monitoring

The designated areas from which pear fruit is sourced for export to Australia (i.e. export orchards, packing houses and the surrounding area) must have a pest monitoring system in place for fruit flies (Tephritidae). The traps must consist of cue lure, trimedlure and methyl eugenol.

AQSIQ must implement a fruit fly monitoring program for the additional regions of Shaanxi and Xinjiang. The fruit fly monitoring program already being undertaken in Hebei and Shandong Provinces must be continued. Additionally, a minimum of one methyl eugenol trap should be placed in each export orchard and any villages present. Summary data, including number and location of traps, trap catches, and species caught for all fruit fly traps (cue lure, trimedlure and methyl eugenol) is to be made available to the AQIS pre-clearance inspector.

AQSIQ will notify Biosecurity Australia of the detection of any species of economically-important fruit flies within 48 hours of detection. AQIS will assess the species and number of individual flies detected and the circumstances of the detection. AQIS will advise AQSIQ of action to be taken. If fruit flies are detected at pre-clearance inspection, trade will stop immediately pending the outcome of an investigation.

Item 6. Inspection of orchards

AQSIQ must inspect all export orchards for pests of concern.

1. If brown rot (*Monilinia fructigena*) is detected in any designated export area, fruit from that export area will not be permitted entry into Australia.

2. Orchards infected with Japanese pear scab (*Venturia nashicola*) will not be permitted to export fruit.

3. If orchard inspections show that more than 0.5% of fruit are infected with black spot (*Alternaria gaisen*) at the time of blossoming, those orchards will be excluded from the export program.

Item 7. Notification of unusual weather conditions

AQSIQ is to notify Biosecurity Australia immediately if unusual weather conditions occur resulting in brown rot, black spot or scab diseases.

Item 8. Pre-harvest inspection

Joint inspection by AQSIQ and the AQIS pre-clearance inspector before harvest must ensure that field control programs are efficacious. The inspection must ensure that bags (where required) are intact, only bagged fruit are harvested and that packing houses have an appropriate level of hygiene. The AQIS inspector must check inspection and sampling facilities, results of detection surveys, fruit fly trap records for the current season and traps if appropriate, and will determine the need to change the intensity of inspection at pre-clearance if necessary.

Item 9. Bagging of fruit and storage

Bags must be placed over fruit of *Pyrus bretschneideri*, *P. pyrifolia* and *P. ussuriensis* grown in Hebei, Shandong and Shaanxi provinces when the fruit is no more than 2.5 cm in diameter. Fruit must be protected by bags to minimise the risk of exposure to specific diseases and pests. Only fruit with intact bags will be permitted for export to Australia and this fruit is not to be stored with non-export fruit.

Bagging is not required for fruit of *P*. sp. nr. *communis* grown in Xinjiang Uighur Autonomous Region (CIQ, 2005), due to the smaller size of the fruit, the physiology of ripening of this species and the climatic conditions and pest status of this area.

Fruit with intact bags (where required) will be delivered to the packing house and must be identified by registered orchard number. Bags must be removed in the packing house away from the packing line.

No fallen fruit is to be collected for export.

Export fruit must be clearly identifiable from domestic fruit.

Item 10. Packing and labelling

Pears must be packed into clean, new cardboard boxes or cartons. No fresh or dried packing material of plant origin (e.g. straw) is to be used. Only processed or synthetic packing material can be used.

To facilitate trace-back in the event of non-compliance, all cartons must be marked 'For Australia', and be labelled with lot number, orchard registration numbers, packing house number, number of cartons per lot and date. To facilitate identification, palletised product is to have this information marked on a uniquely numbered pallet card attached to each pallet or part-pallet.

Item 11. Specific conditions for storage and movement of produce

AQSIQ must ensure that:

- registered packing houses are maintained in a condition that would provide security against reinfestation/reinfection;
- the movement of pears from the time of arrival at the storage premises through to the time of export is recorded;
- records of sufficient detail to allow trace-back to orchard and packing house must be available to AQIS through AQSIQ, if required; and
- packing houses must keep records that facilitate auditing by AQSIQ during grading, packing and storage.

Fruit inspected and certified by CIQ and AQIS for export to Australia must be stored under quarantine security and segregated by at least one metre from all other fruit in a cold storage maintained at 1-3°C until loaded into containers.

Fruit packed for transport must be secured using one of the following methods:

1. fruit must be packed and directly transferred into a shipping container, which must be sealed with a AQSIQ seal and not opened until the container reaches its destination; or
2. fruit must be packed into cartons with screened ventilation holes; the screening mesh size must not exceed 1.6 mm and not less than 0.16 mm strand thickness; or

3. fruit must be packed into cartons and the pallet of cartons must be shrink-wrapped in plastic on all six sides.

AQSIQ must ensure that records are properly maintained to facilitate auditing of fruit during or after storage, and that container doors are sealed after loading.

Item 12. Pre-clearance phytosanitary inspection and remedial action

CIQ and AQIS will jointly inspect all consignments in accordance with AQIS procedures for all visually detectable quarantine pests and regulated articles[4]. The AQIS sampling protocol requires inspection of 600 units for quarantine pests, in systematically selected samples per homogeneous consignment[5] or lot[6]. For pears, AQIS defines a unit as one fruit.

Remedial action must be taken on all quarantine pests detected and CIQ technical specialists, or their nominated agents, will identify all pests to species level and forward this information to AQIS. Duplicate specimens of detected pests, if available, must be given to the AQIS inspector at the time of pre-clearance. Exports will not be permitted until the identification to species level is completed, and this information is sent to AQIS for approval.

If the organism is identified as a quarantine pest, then one of the following actions must be taken:

- if in-field risk management measures are not required (see those pests listed in regular text in **Attachment 1**), then the exporter/grower will be given the option of re-conditioning the affected fruit in the entire lot and the lot will be subsequently re-inspected; or
- if in-field risk management measures are required (see those pests listed in bold text in **Attachment 1**) but have not been effective, then the entire lot will be rejected; or
- if the pest cannot be identified, then the entire lot will be rejected.

A registered orchard which has one rejection will be permitted to submit further lots for the remainder of the season. However, if a second rejection occurs during the same season, then that orchard must be withdrawn from the Australian program. If physalospora canker is found, then all fruit from orchards whose fruit comprised that lot will be rejected. A rejected orchard may not be reinstated into the export program until AQSIQ, AQIS and Biosecurity Australia are satisfied that non-compliance issues have been rectified.

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4 The IPPC defines a regulated article as 'any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved'.

5 A consignment is the number of boxes of fresh pears from China covered by one phytosanitary certificate shipped via one port in China to a designated port in Australia for one consignee on the same vessel on the same day.

6 An inspection lot is the number of boxes presented for a single phytosanitary inspection.

Item 13. Phytosanitary certification

CIQ will issue a Master Phytosanitary Certificate for all pre-export inspected lots. The Master Phytosanitary Certificate will record details of all inspected lots that have passed inspection and are cleared by AQIS for export to Australia. To be consistent with International Standards for Phytosanitary Measures No. 7 *Export Certification Systems* (FAO, 1997), each Master Phytosanitary Certificate is to contain the following additional declaration:

'Produced and inspected under the pear arrangement between AQSIQ and DAFF'

After the AQIS inspector leaves:

- For each shipment a new Phytosanitary Certificate, specifying the lots covered by it, cartons per lot and the container and seal number must be issued by CIQ; and
- Attached to this Phytosanitary Certificate must be a copy of the Master Phytosanitary Certificate jointly signed by CIQ and the AQIS pre-clearance inspector during pre-clearance.

Item 14. On-arrival quarantine clearance by AQIS

On arrival at the port of entry in Australia, AQIS will examine the documentation for consignment verification prior to release from quarantine. AQIS may open the containers to verify the contents only.

Any 'consignment' with incomplete documentation, or with certification that does not conform to specifications, or with seals on the containers that are damaged or missing, will be held pending clarification by AQSIQ and determination by AQIS, with the options of re-export or destruction. AQIS will inform AQSIQ of action including any intention to suspend importation.

Item 15. Confirmation of current prohibition of importation of pome fruit into Western Australia

No part of a consignment will be landed in Western Australia either before or after clearing quarantine in Australia, as current state legislation prohibits the importation of fresh pears from any source.

Item 16. Visits by AQIS

An AQIS inspector(s) must visit China in each year of trade for pre-clearance inspection, both in the field and packing house, unless otherwise agreed by DAFF and AQSIQ on a region by region basis. All new export regions must undergo field inspection during harvest in the first year of trade. The Chinese side will pay fees for the AQIS officers to monitor the implementation of importation protocols, surveys and/or pre-clearance inspection.

Item 17. Review of requirements

DAFF reserves the right to review the agreement at any time if this is deemed necessary.

If brown rot, black spot, or scab is intercepted on imported fruit, then DAFF reserves the right to implement remedial measures as deemed necessary before trade commences next season.

Attachment 1 – Quarantine pests of fresh pear fruit from China. Species in bold text require in-field risk management measures

Scientific name	Common name	Region (pear species)
Arthropods		
Acleris fimbriana (Thunberg & Becklin)	fruit tree tortrix	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Acrobasis pyrivorella (Matsumura)	pear fruit moth	Shandong - *P. bretschneideri*; *P. pyrifolia; P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Acrocercops astaurota (Meyrick)	pear barkminer	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Adoxophyes orana (Fischer von Röeslerstamm)	summer fruit tortrix	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Bactrocera dorsalis (Hendel)	Oriental fruit fly	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Xinjiang – *P. sp. nr. communis*
Cacopsylla pyrisuga (Forster)	pear wood psylla	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*
Carposina sasakii Matsumura	peach fruit borer	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Choristoneura longicellana (Walsingham)	common apple leafroller	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia; P. ussuriensis*
Dolycoris baccarum Linnaeus	sloe bug	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Euzophera pyriella Yang	moth	Shandong - *P. bretschneideri*

Scientific name	Common name	Region (pear species)
		Hebei - *P. bretschneideri*
Grapholita inopinata (Heinrich)	Manchurian fruit moth	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Halyomorpha picus (Fabricius)	yellow-brown stink bug	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Holotrichia parallela (Motschulsky)	large black chafer	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Holotrichia titanis Reitter	brown chafer	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*
Hoplocampa pyricola Rohwer	pear sawfly	Shandong - *P. pyrifolia*; *P. ussuriensis* Hebei - *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Leucoptera malifoliella (Costa)	pear leaf miner	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Lopholeucaspis japonica (Cockerell)	pear white scale	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*
Lymantria dispar (Linnaeus)	gypsy moth	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Pandemis heparana (Denis & Schiffermüller)	apple brown tortrix	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*
Pseudococcus comstocki (Kuwana)	Comstock mealybug	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Rhynchites coreanus Kono	Japanese apple weevil	Shandong - *P. bretschneideri*; Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Rhynchites foveipennis Fairmaire	Korean pear weevil/curculio	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Rhynchites heros Roelofs	Japanese pear weevil	Hebei – *P. pyrifolia*; *P. ussuriensis*
Sphanostigma iakusuiense (Kishida)	powdery pear aphid	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*

Scientific name	Common name	Region (pear species)
		Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Spilonota albicana Motschulsky	eye spotted bud moth	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Spilonota lechriaspis Meyrick	tip shoot tortrix	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri;* *P. pyrifolia*; *P. ussuriensis*
Spilonota ocellana (Denis & Schiffermüller)	moth	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*
Stephanitis nashi Esaki & Takeya	pear lace bug	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Tetranychus viennensis Zacher	hawthorn (spider) mite	Shandong - *P. bretschneideri* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Urochela luteovaria Distant	pear stink bug	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Vespa mandarinia Smith	paper wasp	Hebei – *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Pathogens		
Alternaria gaisen Nagano	black spot of Japanese pear	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Alternaria yaliinficiens R. G. Roberts	chocolate spot of Ya Li pear	Hebei – *P. bretschneideri*
Gymnosporangium asiaticum Miyabe ex G. Yamada	Japanese pear rust	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Gymnosporangium sabinae (Dicks) G.	European pear rust	Shaanxi - *P. bretschneideri*;

Scientific name	Common name	Region (pear species)
Winter		*P. pyrifolia*; *P. ussuriensis*
Monilinia fructigena Honey	brown rot	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Phomopsis fukushii Tanaka et Eudo	Japanese pear canker	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Physalospora piricola Nose	physalospora canker	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*
Venturia nashicola Tanaka & Yamamoto	Japanese pear scab	Shandong - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Hebei - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis* Shaanxi - *P. bretschneideri*; *P. pyrifolia*; *P. ussuriensis*

7 CONCLUSIONS

The findings of this final import policy are based on a comprehensive analysis of relevant available scientific literature and existing import requirements for pears from Hebei and Shandong Provinces in China.

Biosecurity Australia considers that the risk management measures recommended in the final import policy will provide an appropriate level of protection against the pests identified in the PRA.

8 STAKEHOLDER COMMENTS ON THE DRAFT EXTENSION OF EXISTING POLICY REPORT

Biosecurity Australia circulated the draft report for the extension of existing policy for pears from China on 8 April 2005, and invited stakeholders to comment on the technical issues raised in the draft report by 9 May 2005.

Biosecurity Australia received seven written responses, five from Australian State Departments of Agriculture, one from an industry association and one from AQSIQ (Table 11).

Comments were received relating to the validity and pathogenicity of the newly-described *Alternaria* species (*Alternaria yaliinficiens*); the current status of *Gymnosporangium sabinae* in China; nomenclatural clarification of species and varieties of intended export fruit; pre-clearance of fruit before export; the taxonomic status of *Rhynchites heros*; adherence to and audit of current pest control protocols; the presence and taxonomic clarification of several arthropod and pathogen species in areas proposed for export; and confirmation of the current prohibition of importation of apples and pears into Western Australia, and associated prevention of pest and disease transfer into that state.

Table 11: Stakeholders that responded to the draft extension of existing policy report

Organisation	Representative	Date received
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	Lu Houlin – Deputy Director General, Department of Supervision for Animal and Plant Quarantine	29 April 2005
Tasmanian Department of Primary Industries, Water and the Environment	Andrew Bishop – Senior Scientific Advisor (Biosecurity)	9 May 2005
Department of Agriculture Western Australia	Shashi Sharma – Program Manager	9 May 2005
Department of Primary Industries and Fisheries – Queensland	Jim Varghese – Director General	6 June 2005
Apple and Pear Growers Association of South Australia Incorporated.	Trevor Ranford – General Manager	9 May 2005
Department of Primary Industries – Victoria	Peter J Bailey – Executive Director	6 June 2005
Department of Primary Industries – New South Wales	Barry D Buffier – Director General	15 August 2005

Comments by stakeholders were considered and material matters raised have been incorporated into, or addressed in, this *Final Extension of Policy for the Importation Pears from the People's Republic of China*. Biosecurity Australia would like to thank all those who provided comments, as these assist in ensuring that the risk assessment process is technically accurate and rigorous.

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APPENDIX – 1: PEST CATEGORISATION

1A: Pests associated with pears in China (all provinces and regions under consideration) including species considered in previous assessments

1B: Pest categorisation for species associated with pears from China not considered previously – consideration of presence in Australia and pathway association

1C: Potential for establishment or spread and associated consequences for new pests of pears from China

Appendix – 1A: Pests associated with pears in China (all provinces and regions under consideration) including species considered in previous assessments

New pests not considered in previous assessments[7] are listed in **bold** text, and are further categorised in Appendix 2.

Only valid names are used in this table. For lists of synonyms and outdated names please refer to the Draft document, AQIS (1998) and AFFA (2003).

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
ARTHROPODS							
Acari (mites)							
Brevipalpus ruber Wainstein [Acari: Tenuipalpidae]	false spider mite				AQSIQ, 2004		**Yes**
Bryobia rubrioculus (Scheuten) [Acari: Tetranychidae]	brown apple mite	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Eotetranychus pruni (Oudemans) [Acari: Tetranychidae]	apple yellow mite				CIQ Xinjiang, 2005		**Yes**
Epitrimerus pyri (Nalepa) [Acari: Eriophyidae]	pear rust mite			AQSIQ, 2004			**Yes**
Eriophyes pyri Pagenstecher [Acari: Eriophyidae]	pear leaf blister mite		AFFA, 2003	AQSIQ, 2004		Yes (AFFA, 2003)	
Panonychus ulmi (Koch) [Acari: Tetranychidae]	European red mite		AFFA, 2003			Yes (AQIS, 1998)	
Tetranychus kanzawai Kishida [Acari: Tetranychidae]	Kanzawa spider mite				Podleckis, 2003		**Yes**
Tetranychus turkestani (Ugarov & Nikolski) [Acari: Tetranychidae]	strawberry spider mite				CIQ Xinjiang, 2005		**Yes**
Tetranychus urticae Koch	two-spotted spider mite		AFFA, 2003	AQSIQ, 2004		Yes (AFFA, 2003)	

[7] Import risk analysis of the importation of Ya pear (*Pyrus bretschneideri*) from China (Hebei and Shandong provinces) (AQIS, 1998) and extension of existing policy to import Asian (Shandong) pear (*Pyrus pyrifolia* and *P. ussuriensis* var *viridis*) from Shandong province (AFFA, 2003).

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
[Acari: Tetranychidae]							
Tetranychus viennensis Zacher [Acari: Tetranychidae]	hawthorn (spider) mite	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Coleoptera (beetles, weevils)							
Agrilus mali Matsumura [Coleoptera: Buprestidae]	apple wood borer	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Anomala corpulenta Motschulsky [Coleoptera: Scarabaeidae]	scarab beetle	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Anoplophora glabripennis Motschulsky [Coleoptera: Cerambycidae]	Asian long-horned beetle	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Apriona germarii (Hope) [Coleoptera: Cerambycidae]	long-horned stem borer	AQSIQ, 2004	AFFA, 2003			Yes (AFFA, 2003)	
Aromia bungii (Falderman) [Coleoptera: Cerambycidae]	red neck beetles	AQIS, 1998	AQIS, 1998			Yes (AFFA, 2003)	
Asias halodendri Pallas [Coleoptera: Cerambycidae]	longicorn beetle	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Bacchisa fortunei Thomson [Coleoptera: Cerambycidae]	pear borer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Byctiscus betulae (Linnaeus) [Coleoptera: Rhynchitidae]	birch attelabid	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Callidium sp. [Coleoptera: Cerambycidae]	longicorn beetle				CIQ Xinjiang, 2005		**Yes**
Chrysobothris succedanea Saunders [Coleoptera: Buprestidae]	six-spotted buprestid		AFFA, 2003			Yes (AFFA, 2003)	
Holotrichia parallela Motschulsky [Coleoptera: Scarabaeidae]	large black chafer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Holotrichia titanis Reitter [Coleoptera: Scarabaeidae]	brown chafer	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Lampra bellula Lewis (Coleoptera: Buprestidae)	jewel beetle	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Lampra limbata Gebler (Coleoptera: Buprestidae)	golden Jewel beetle	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
Oxycetonia jucunda (Faldermann) [Coleoptera: Scarabaeidae]	citrus flower chafer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Popillia quadriguttata (Fabricius) [Coleoptera: Scarabaeidae]	Chinese rose beetle	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Potosia brevitarsis (Lewis) [Coleoptera: Scarabaeidae]	white-spotted flower chafer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Proagopertha lucidula Faldermann [Coleoptera: Scarabaeidae]	Lucidula chafer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Rhynchites coreanus Kono [Coleoptera: Attelabidae]	pear leaf weevil/curculio	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Rhynchites foveipennis Fairmaire [Coleoptera: Attelabidae]	Korean pear weevil/curculio	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Rhynchites heros Roelofs [Coleoptera: Attelabidae]	Japanese pear weevil	Chao & Lee, 1966					**Yes**
Serica orientalis Motschulsky [Coleoptera: Scarabaeidae]	smaller velvet chafer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Diptera (flies)							
Bactrocera dorsalis (Hendel)) [Diptera: Tephritidae]	Oriental fruit fly	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Hemiptera (aphids, leafhoppers, mealybugs, scales, true bugs, whiteflies)							
Anuraphis piricola Okamoto & Takahashi [Hemiptera: Aphididae]	pear round-tailed aphid	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Aphis spiraecola Patch [Hemiptera: Aphididae]	brown citrus aphid	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Cacopsylla chinensis (Li & Yang) [Hemiptera: Psyllidae]	pear psyllid			AQSIQ, 2004			**Yes**
Cacopsylla pyrisuga (Förster) [Hemiptera: Psyllidae]	pear wood psylla	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Ceroplastes japonicus Green [Hemiptera: Coccidae]	Japan wax scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Ceroplastes rubens Maskall [Hemiptera: Coccidae]	pink wax scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
Coccus hesperidum hesperidum Linnaeus [Hemiptera: Coccidae]	brown scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Cryptotympana pustulata Fabricius [Hemiptera: Cicadellidae]	blackish cicada	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Diaspidiotus perniciosus (Comstock) [Hemiptera: Diaspididae]	San Jose scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Didesmococcus coreanus Borchs [Hemiptera: Diaspididae]	peach scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Dolycoris baccarum Linnaeus [Hemiptera: Pentatomidae]	sloe bug	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Drosicha corpulenta (Kuwana) [Hemiptera: Margarodidae]	giant mealybug		AFFA, 2003	AQSIQ, 2004		Yes (AFFA, 2003)	
Empoasca flavescens (Fabricius) [Hemiptera: Cicadellidae]	small green leafhopper	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Erthesina fullo (Thunberg) [Hemiptera: Pentatomidae]	yellow spot stink bug	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Erythroneura apicalis Nawa [Hemiptera: Cicadellidae]	grape leafhopper			CIQ SA, 2000			**Yes**
Eulecanium kunoensis (Kuwana) [Hemiptera: Coccidae]	peach firm scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Halyomorpha picus (Fabricius) [Hemiptera: Pentatomidae]	yellow-brown stink bug	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Icerya purchasi Maskell [Hemiptera: Margarodidae]	fluted scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Lepidosaphes ulmi (Linnaeus) [Hemiptera: Diaspididae]	apple mussel scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Lopholeucaspis japonica (Cockerell) [Hemiptera: Diaspididae]	pear white scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Lygocoris lucorum (Meyer) [Hemiptera: Pentatomidae]	small green plant bug		AFFA, 2003			Yes (AFFA, 2003)	
Myzus persicae (Sulzer) [Hemiptera: Aphididae]	green peach aphid	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Nezara viridula (Linnaeus)	green vegetable bug	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
[Hemiptera: Pentatomidae]							
Parlatoria oleae (Colvée) [Hemiptera: Diaspididae]	olive Parlatoria scale				AQSIQ, 2004		**Yes**
Parlatoria pergandii Comstock [Hemiptera: Diaspididae]	chaff scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Parthenolecanium corni (Bouché) [Hemiptera: Coccidae]	European fruit lecanium				CIQ Xinjiang, 2005		**Yes**
Phenacoccus mespili (Signoret) [Hemiptera: Pseudococcidae]	scale insect				CIQ Xinjiang, 2005		**Yes**
Platypleura kaempferi (Fabricius) [Hemiptera: Cicadidae]	Kaempfer cicada		AFFA, 2003			Yes (AFFA, 2003)	
Pseudaonidia duplex (Cockerell) [Hemiptera: Coccidae]	camphor scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Pseudaulacaspis pentagona (Targioni Tozzetti) [Hemiptera: Diaspididae]	white peach scale	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Pseudococcus comstocki (Kuwana) [Hemiptera: Pseudococccidae]	Comstock's mealybug	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Psylla chinensis Yang & Li [Hemiptera: Psyllidae]	Chinese pear psyllid	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Rhodococcus turanicus (Archangelskaya) [Hemiptera: Coccidae]	Turanian scale				CIQ Xinjiang, 2005		**Yes**
Sappaphis sp. [Hemiptera: Aphididae]	hairy aphid			AQSIQ, 2004			**Yes**
Schizaphis piricola (Matsumura) [Hemiptera: Aphididae]	pear yellow aphid	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Sphaerolecanium prunastri Boyer de Fonscolombe [Hemiptera: Coccidae]	blackthorn scale	CAB International, 2004					**Yes**
Sphanostigma iakusuiense (Kishida) [Hemiptera: Aphididae]	powdery pear aphid	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Stephanitis nashi Esaki & Takeya	pear lace bug	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
[Hemiptera: Tingidae]							
Tettigella viridis Linnaeus [Hemiptera: Cicadellidae]	green leafhopper	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Urochela luteovaria Distant [Hemiptera: Urostylidae]	pear stink bug	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Hymenoptera (ants, bees, wasps)							
Hoplocampa pyricola Rohwer [Hymenoptera: Tenthredinidae]	pear sawfly	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Janus gussakovskii Maa [Hymenoptera: Cephidae]	stem girdler	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Janus piri Okamoto & Muramatsu [Hymenoptera: Cephidae]	pear stem sawfly	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Vespa mandarinia Smith [Hymenoptera: Vespidae]	paper wasp	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Lepidoptera (butterflies, moths)							
Acleris fimbriana Thunberg [Lepidoptera:Tortricidae]	fruit tree tortrix	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Acrobasis pyrivorella (Matsumura) [Lepidoptera: Pyralidae]	pear fruit moth	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AFFA, 2003; AQIS, 1998)	
Acrocercops astaurota Meyrick [Lepidoptera: Gracillariidae]	pear bark miner	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Acronicta intermedia (Warren) [Lepidoptera: Noctuidae]	raspberry bud moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Acronicta rumicis (Linnaeus) [Lepidoptera: Noctuidae]	knotgrass moth		AFFA, 2003		AQSIQ, 2004	Yes (AFFA, 2003)	
Actias selene ningpoana Felder [Lepidoptera: Saturniidae]	green actias moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Adoxophyes orana (Fischer von Roslerstamm) [Lepidoptera: Tortricidae]	summer fruit tortrix	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Amsacta lactinea (Cramer) [Lepidoptera: Arctiidae]	red tiger moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
Apocheima cinerarius Erschoff [Lepidoptera: Geometridae]	popular looper	AQIS, 1998 AQSIQ, 2004	AQIS, 1998	AQSIQ, 2004	AQSIQ, 2004	Yes (AQIS, 1998)	
Aporia crataegi (Linnaeus) [Lepidoptera: Pieridae]	black-veined white	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Archips xylosteana (Linnaeus) [Lepidoptera:Tortricidae]	apple variegated tortrix	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Blastodacna pyrigalla (Yang) [Lepidoptera: Blastodacnidae]	pear fruit borer	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Carposina sasakii Matsumura [Lepidoptera: Carposinidae]	peach fruit borer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Choristoneura longicellana (Walsingham) [Lepidoptera:Tortricidae]	common apple leaf roller	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Clania variegata Snellen [Lepidoptera: Pyralidae]	cotton bag worm		AFFA, 2003			Yes (AQIS, 1998)	
Conobathra bifidella Leech [Lepidoptera: Pyralidae]	lump insect	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Conogethes punctiferalis (Guenée) [Lepidoptera: Pyralidae]	yellow peach moth	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Cydia pomonella Linnaeus [Lepidoptera: Tortricidae]	codling moth				AQSIQ, 2004		**Yes**
Euproctis similis (Fuessly) [Lepidoptera: Lymantriidae]	mulberry tussock moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Euzophera pyriella Yang [Lepidoptera: Pyralidae]	pyralid moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Gastropacha quercifolia Linnaeus [Lepidoptera: Lasiocampidae]	lappet, snout moth	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Grapholitha inopinata Heinrich [Lepidoptera: Tortricidae]	Manchurian fruit moth	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Grapholitha molesta Busck [Lepidoptera: Tortricidae]	Oriental fruit moth	AQIS, 1998	AQIS, 1998	AQSIQ, 2004	AQSIQ, 2004	Yes (AQIS, 1998)	
Helicoverpa armigera (Hübner) [Lepidoptera: Noctuidae]	cotton bollworm		AFFA, 2003			Yes (AFFA, 2003)	
Illiberis pruni Dyar	pear leaf worm	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
[Lepidoptera: Zygaenidae]							
Latoia consocia (Walker) [Lepidoptera: Limacodidae]	green cochlid	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Latoia hilarata (Staudinger) [Lepidoptera: Limacodidae]	stinging caterpillar; nettle grub	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Leucoptera malifoliella Costa [Lepidoptera: Lyonetiidae]	pear leaf miner	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Lymantria dispar Linnaeus [Hemiptera: Lymantriidae]	gypsy moth	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Malacosoma neustria testacea Matschulsky [Lepidoptera: Lasiocampidae]	tent caterpillar	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Marumba gaschukewitschi (Bremer & Grey) [Lepidoptera: Sphingidae]	peach horn worm	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Monema flavescens Walker [Lepidoptera: Heterogeneidae]	Oriental fruit moth	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Odites leucostola Meyrick [Lepidoptera: Coleophoridae]	lecithocerid moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Odonestis pruni Linnaeus [Lepidoptera: Lasiocampidae]	apple caterpillar	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Oraesia emarginata (Fabricius) [Lepidoptera: Noctuidae]	fruit piercing moth			AQSIQ, 2004			**Yes**
Oraesia excavata (Butler) [Lepidoptera: Noctuidae]	fruit piercing moth			AQSIQ, 2004			**Yes**
Pandemis heparana Denis & Schiffermuller [Lepidoptera: Tortricidae]	apple brown tortrix	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Phalera flavescens Bremer & Grey [Lepidoptera: Noctuidae]	cherry caterpillar	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Phlossa conguncta Walker [Lepidoptera: Limacodidae]	slug caterpillar	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Phyllonorycter ringoniella (Matsumura) [Lepidoptera: Gracillariidae]	apple leaf miner	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Sinitinea pyrigalla Yang [Lepidoptera: Blastodacnidae]	pear fruit borer	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
Spilonota albicana (Motschulsky) [Lepidoptera: Tortricidae]	eye spotted bud moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Spilonota lechriaspis Meyrick [Lepidoptera: Tortricidae]	tipshoot tortrix	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Spilonota ocellana Fabricius [Lepidoptera: Tortricidae]	eye spotted bud moth	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Synanthedon hector (Butler) [Lepidoptera: Sesiidae]	cherry tree borer	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Telphusa chloroderces Meyrick [Lepidoptera: Gelechiidae]	black star leaf roller	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Thosea sinensis (Walker) [Lepidoptera: Limacodidae]	nettle grub	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
PATHOGENS							
Bacteria							
Rhizobium radiobacter (Beijerinck & Van Delden) Young *et al*.	crown gall		AFFA, 2003			Yes (AFFA, 2003)	
Fungi							
Alternaria alternata (Fr.: Fr.) Keissl.	Alternaria leaf spot	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Alternaria gaisen Nagano	black spot of Japanese pear	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Alternaria yaliinficiens Roberts	chocolate spot of Ya Li pear	Roberts, 2005					**Yes**
Armillaria mellea (Vahl) P. Kummer	Armillaria root rot	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Armillaria tabescens (Scop.) Dennis *et al*.	Armillaria root rot	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Athelia rolfsii (Curzi) Tu & Kimbrough			AFFA, 2003			Yes (AFFA, 2003)	
Botryosphaeria dothidea (Mougeot ex E.M. Fries) Cesati & de Notaris			AFFA, 2003			Yes (AQIS, 1998)	
Botryosphaeria obtusa (Schwein.) Shoemaker	black rot	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Botrytis cinerea Pers: Fr.	grey mould	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
Colletotrichum gloeosporioides (Penz.) Penz. & Sacc. In Penz.	anthracnose	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Cytospora carphosperma Sacc.	canker				AQSIQ, 2004		**Yes**
Diaporthe ambigua Nitschke	pear canker	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Fomes truncatoporaus (Lloyd) Teng	heart rot	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Formes spp.			AFFA, 2003			Yes (AFFA, 2003)	
Gloeodes pomigena (Schwein.) Colby	apple blotch disease		AFFA, 2003			Yes (AFFA, 2003)	
Gymnosporangium asiaticum Miyabe ex.G.Yamada	Japanese pear rust	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Gymnosporangium sabinae (Dicks) G. Winter	European pear rust			Wang & Guo, 1985			**Yes**
Helicobasidium mompa Tanaka	pear tree violet root rot		AFFA, 2003			Yes (AFFA, 2003)	
Monilinia fructigena (Aderh. & Ruhl) Honey	brown rot	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Mycosphaerella pomacearum (Cord.) Sacc.	leaf spot	Tai, 1979					**Yes**
Mycosphaerella pyri (Auersw.) Boerema	pear leaf/fruit spot	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Penicillium expansum (Link) Thom.	blue mould of apple	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Phomopsis fukushii Tanaka & Eudo	Japanese pear canker	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Phyllactinia corylea (Pers.) Karst	powdery mildew	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Phyllactinia pyri (Cast) Homma	powdery mildew of pear	AQSIQ, 2004	AFFA, 2003	AQSIQ, 2004		Yes (AFFA, 2003)	
Physalospora piricola Nose	physalospora canker	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Podosphaera leucotricha (Ell. & Ev.)	powdery mildew of apple	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Rhizopus stolonifer (Ehrenb. ex Fr.) Vuill	Rhizopus rot	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Rosellinia necatrix Prill.	Dematophora root rot		AFFA, 2003			Yes (AFFA, 2003)	
Schizothyrium pomi (Mont.) v. Arx	fly speck		AFFA, 2003			Yes (AFFA, 2003)	
Trichothecium roseum (Bull) Link	fruit rot	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Valsa ambiens (Pers.) Fr.	valsa canker	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	

Pests	Common name	Presence in				Assessed previously	Consider further (yes/no)
		Hebei	Shandong	Shaanxi	Xinjiang		
Valsa ceratosperma (Tode) Maire	valsa canker	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Venturia nashicola Tanaka & Yamamoto	Japanese pear scab	AQIS, 1998	AQIS, 1998	AQSIQ, 2004		Yes (AQIS, 1998)	
Venturia pirina Aderh.	pear scab	AQIS, 1998	AQIS, 1998			Yes (AQIS, 1998)	
Nematodes							
Meloidogyne spp.	root knot nematode		AFFA, 2003			Yes (AFFA, 2003)	
Viroids							
Apple scar skin viroid (ASSVd)	pear rusty skin disease	Shamloul *et al*., 2003					**Yes**

Appendix – 1B: Pest categorisation for species associated with pears from China not considered previously – consideration of presence in Australia and pathway association

Only valid names are used in this table. For lists of synonyms and outdated names please refer to the Draft document, AQIS (1998) and AFFA (2003).

Pest	Common name	Presence in Australia	Pathway association	Consider further (yes/no)
ARTHROPODS				
Acari (mites)				
Brevipalpus ruber Wainstein [Acari: Tenuipalpidae]	false spider mite		No – primarily associated with foliage (Cave and Lightfield, 1997).	
Eotetranychus pruni (Oudemans) [Acari: Tetranychidae]	apple yellow mite		No – attacks leaves and stems of host plants (CIQ, 2005).	
Epitrimerus pyri (Nalepa) [Acari: Eriophyidae]	pear rust mite	Knihinicki and Boczek, 2002		
Tetranychus kanzawai Kishida [Acari: Tetranychidae]	Kanzawa spider mite	Halliday, 2000		
Tetranychus turkestani (Ugarov & Nikolski) [Acari: Tetranychidae]	strawberry spider mite		No – primarily associated with foliage (CIQ, 2005).	
Coleoptera (beetle, weevils)				
Callidium sp. [Coleoptera: Cerambycidae]	longicorn beetle		No **–** bores into stems (CIQ, 2005).	
Rhynchites heros Roelofs [Coleoptera: Attelabidae]	Japanese pear weevil		**Yes** – females oviposit in the young pear fruit (Hanson, 1963).	**Yes**
Hemiptera (aphids, leafhoppers, mealybugs, psyllids, scales, true bugs, whiteflies)				
Cacopsylla chinensis (Li & Yang) [Hemiptera: Psyllidae]	pear psyllid		No – adults and nymphs occur on young shoots, young fruit, leaves and branches. Females lay 300 eggs each on leaves and shoots (Liu, 2004).	
Erythroneura apicalis Nawa [Hemiptera: Cicadellidae]	grape leafhopper		No – *Erythroneura* spp. are petiole or leaf feeders (Valley and Wheeler, 1985; Jensen *et al*., 1969).	

Pest	Common name	Presence in Australia	Pathway association	Consider further (yes/no)
Parlatoria oleae (Colvée) [Hemiptera: Diaspididae]	olive Parlatoria scale	Donaldson and Tsang, 2002		
Parthenolecanium corni (Bouché) [Hemiptera: Coccidae]	European fruit lecanium		No – all stages of life cycle inhabit twigs, stems and leaves of host plant (Marotta and Tranfaglia, 1997).	
Phenacoccus mespili (Signoret) [Hemiptera: Pseudococcidae]	scale insect		No – occurs on bark or trunk of host plant (Ben-Dov, 1994).	
Rhodococcus turanicus (Archangelskaya) [Hemiptera: Coccidae]	Turanian scale		No – occupy twigs, branches and leaves of host plant (Pfeiffer, 1997).	
Sappaphis sp. [Hemiptera: Aphididae]	hairy aphid		No – all stages of this species feed on undersides of leaves, not the fruit (Blackman and Eastop, 2000).	
Sphaerolecanium prunastri Boyer de Fonscolombe [Hemiptera: Coccidae]	blackthorn scale		No – completes whole lifecycle on trunk, branches or twigs of host tree (CAB International, 2004).	
Lepidoptera (moths, butterflies)				
Cydia pomonella (L). [Lepidoptera: Tortricidae]	codling moth	Nielsen *et al*., 1996		
Oraesia emarginata (Fabricius) [Lepidoptera: Noctuidae]	fruit-piercing moth	Nielsen *et al*., 1996		
Oraesia excavata (Butler) [Lepidoptera: Noctuidae]	fruit-piercing moth		No – both larval and adult noctuid moths are inactive during the day and hide amongst the foliage or leaf litter. During the night, adults usually feed on overripe or fermenting fruit (Common, 1990).	
PATHOGENS				
Fungi				
Alternaria yaliinficiens Roberts	chocolate spot of Ya Li pear		**Yes** – Associated with fruit of Ya Li pear (Roberts, 2005).	**Yes**
Cytospora carphosperma Sacc.	canker		No – Not associated with fruit pathway (Tai, 1979).	
Gymnosporangium sabinae (Dicks) G. Winter	European pear rust		**Yes** – Fruit may become infected (CAB International, 2004).	**Yes**
Mycosphaerella pomacearum (Cord.) Sacc.	leaf spot		No – Symptoms of *Mycosphaerella* infection occur on the leaves, especially dead leaves, of their hosts (van	

Pest	Common name	Presence in Australia	Pathway association	Consider further (yes/no)
			der Zwet, 1990).	
Viroids				
Apple scar skin viroid (ASSVd)	pear rusty skin disease		**Yes** – Viroid can be found in the fruit pulp, but not in the seeds (Hurtt and Podleckis, 1995).	**Yes**

Appendix – 1C: Potential for establishment or spread and associated consequences for new pests of pears from China

Only valid names are used in this table. For lists of synonyms and outdated names please refer to the Draft document, AQIS (1998) and AFFA (2003).

Scientific name	Common name	Potential for establishment or spread in the PRA area		Potential for consequences		Consider pest further? (yes/no)
		Feasible/ not feasible	Comments	Significant/ not significant	Comments	
ARTHROPODS						
Rhynchites heros Roelofs [Coleoptera: Attelabidae]	Japanese pear weevil	Feasible	Wide host range (USDA, 1958). Adults and larvae are capable of overwintering (USDA, 1958; Hanson, 1963).	Significant	Considered one of the most serious pests of fruit in China through adult feeding on all plant parts (Hanson, 1963). Economic impacts would occur primarily though restrictions imposed on fruit from areas where Japanese pear weevil becomes established.	**Yes**
PATHOGENS						
Fungi						
Alternaria yaliinficiens Roberts	chocolate spot of Ya Li pear	Feasible	This pathogen has a very restricted host range (Roberts, 2005).	Significant	Minor postharvest rot. Economic impacts would occur primarily though restrictions imposed on fruit from areas where this pathogen becomes established.	**Yes**
Gymnosporangium sabinae (Dicks) G. Winter	European pear rust	Feasible	This pathogen has a restricted host range - pear and *Juniperus* sp. (Aldwinckle, 1990). This rust needs a *Juniperus* host to complete its life cycle (CAB International, 2004).	Significant	A serious disease of pears in Europe, parts of Asia and North America (Aldwinkle, 1990). Economic impacts would occur primarily though restrictions imposed on fruit from areas where this pathogen becomes established.	**Yes**
Viroids						

Scientific name	Common name	Potential for establishment or spread in the PRA area		Potential for consequences		Consider pest further? (yes/no)
		Feasible/ not feasible	Comments	Significant/ not significant	Comments	
Apple scar skin viroid (ASSVd)	pear rusty skin disease	Not feasible	There are no known vectors of the viroid and there is no transmission by seed (Hurtt & Podleckis, 1995; Koganezawa, 1989; Podleckis, 2003).			

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APPENDIX – 2: DATA SHEETS FOR QUARANTINE PESTS

2.1 Arthropods

2.1.1 Japanese pear weevil

Rhynchites heros Roelofs [Coleoptera: Rhynchitidae]

Common name(s): Japanese pear weevil; fruit weevil; peach weevil; peach curculio (USDA, 1958; Yoshizawa, 1985).

Synonym(s): None. However, the species *R. foveipennis*, *R. ignites* and *R. coreanus* are considered synonyms of *R. heros* (A. Legalov, personal communication), suggesting that these species are very closely related if not the same species.

Host(s): *Pyrus* spp. (pears), *Prunus persicae* (peach), *Prunus* spp. (stone fruit), *Ficus carica* (fig), *Malus pumila* (apple), *Cydonia oblonga* (quince), *Eriobotrya japonica* (loquat) (USDA, 1958).

Part(s) of plant affected: All parts of the plant including fruit (Hanson, 1963; USDA, 1958).

Distribution: China (Hebei) (Chao & Lee, 1966) (Szechuan, Chekiang) (Hanson, 1963); Japan (Lee & Morimoto, 1988; Yoshizawa, 1985); Korea (Hanson, 1963; USDA, 1958).

Biology: Adults are approximately 10 mm long, iridescent reddish-purple in colour, and covered in soft, dark red hairs (USDA, 1958). The body and wings are densely covered in small pits and furrows (USDA, 1958). Adult legs are long. Eggs are elliptical, white, approximately 7 mm long (USDA, 1958). Mature larvae are 12 mm long, strongly curved, without legs, and with a row of projections present on each body segment (USDA, 1958). Pupae are yellow and have long white thorns on the back of the head, underneath the thorax and on each abdominal segment (USDA, 1958). The anal end of the body possesses a pair of brown horns (USDA, 1958).

In China, adults emerge from hibernation in mid-April and can mate 3-4 days later (USDA, 1958). In China, mating is completed before the end of May (Hanson, 1963). Females deposit 1-3 eggs in 7 mm-deep holes eaten into immature fruit (USDA, 1958). Only one hole is usually made in each fruit, although more are made when adult populations are dense (USDA, 1958). Each female produces between 35 and 50 eggs over approximately 50 days (Hanson, 1963; USDA, 1958).

Development of immature stages occurs from June to November (Hanson, 1963). Larvae hatch after an incubation time of 6-7 days (Hanson, 1963; USDA, 1958). Larvae feed on and develop within the fruit for 18-50 days (Hanson, 1963; USDA, 1958), although they can leave the fruit and feed on roots of weeds and decaying vegetables (USDA, 1958). Late-maturing larvae hibernate in earthen cells and pupate in the spring (USDA, 1958). Prepupal and pupal stages occur in the soil, and pupation lasts 3-4 weeks (Hanson, 1963; USDA, 1958). Adults are nocturnal, live throughout summer and attack all available fruit and other parts of the tree (USDA, 1958). There is only one generation per year, and both adults and larvae can overwinter (USDA, 1958; Hanson, 1963). The life cycle from egg to the end of the pupal stage lasts approximately 132 days, and adults live for approximately 320 days (Hanson, 1963).

After laying eggs in immature fruit, female weevils sever the stalk, causing the fruit to fall to the ground, allowing the larva to more easily enter the soil for pupation (Hanson, 1963).

Adults have chewing mouthparts and cause feeding damage to plant tissue. Females cause damage to fruit when they oviposit, which in turn causes fruit drop from each tree (USDA, 1958; Hanson, 1963). Adults are active from mid-April to July, and their feeding can damage fruit over this period. Adults die by the end of July in China (Hanson, 1963). Larvae also damage plant tissue by their feeding. Indirect effects of feeding include infestation of the fungus *Sclerotinia fructigena*, which has been shown to occur following bites from female *R. bacchus* (INRA, 2004a).

In field trials, 80-83% of *R. foveipennis* were killed when infected with the nematode *Steinernema feltiae* [Syn. *Neoaplectana feltiae*] (Liu *et al*., 1991). Hanson (1963) reported that in China a fungus infested *R. heros* larvae and an unidentified mite attacked the eggs of this species. Chemical control of *Rhynchites* spp. can be effective; *R. cribripennis* has been controlled in Greece with organophosphorus (Lykouressis *et al*., 2004).

Rhynchites heros is regarded as one of the most serious pests of fruit in China, and the adults cause great damage by feeding on all parts of the plant. The economic importance of other *Rhynchites* species in Europe ranges from being a pest of secondary importance in orchards (*R. coeruleus*) (INRA 2004b), to having serious effects. For example, the larva of *R. bacchus* "devours a very large number of fruitlets", and the adults destroy numerous buds (INRA 2004a). Infection of young fruit causes fruit drop and a reduction in pear fruit yield.

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2.2 Pathogens

2.2.1 Chocolate spot of Ya Li pear

Alternaria yaliinficiens R.G. Roberts

Synonym(s): None.

Host(s): *Pyrus bretschneideri* (Chinese Ya pear) (Roberts, 2005).

Part(s) of plant affected: Mature fruit and fruit stems (Roberts, 2005).

Distribution: China (Hebei Province) (Roberts, 2005).

Biology: The nature of the fungal colony of *A. yaliinficiens* and its pattern of growth depends on the nutrient source. On Ya Li pear fruit inoculated and held for 189 days post-inoculation under alternating cycles of light (8 hr) and dark (16 hr), conidia are produced from simple or branched conidiophores with an upper range of 75-108 x 5-6 µm (micrometres) that arise from clusters of deeply pigmented cells (Roberts, 2005). The size of conidia varies greatly within each strain (AQSIQ, 2005; Roberts, 2005). Conidia are produced singly or in short, usually unbranched chains of 2-3 spores, or occasionally short-branched chains of similar length (Roberts, 2005). Conidia vary in shape from oval to cylindrical, and can be deeply constricted (Roberts, 2005). The upper range of spore size is 40-70 x 16-21 µm (Roberts, 2005). Colonies exhibit rings of growth corresponding to alternating exposure to light (dark rings of culture) and dark (light rings of culture) (Roberts, 2005).

On potato carrot agar (PCA), primary conidiophores in light-exposed areas are erect and vary from 48-140 x 3.3-5.3 µm. Conidiophores are transparent, becoming pigmented towards their far end (Roberts, 2005). Conidial chains are initially unbranched, and then branching occurs after 3 days of growth. Conidia produced in such cultures are beakless. The angled branching and long secondary chains give cultures observed at 50 times magnification a tangled appearance (Roberts, 2005).

Sporulation is sparser on half-strength PCA. Secondary conidiophores are more abundant and longer than on full strength PCA, otherwise the appearance is the same (Roberts, 2005).

On hay agar, sporulation is sparse, with solitary or branched conidiophores arising directly from the agar surface (Roberts, 2005). Chains of 10 or fewer, pale straw-coloured conidia form. At 9 days of growth, upper ranges of spore measurements were 37.3-51.3 x 9.4-12.3 µm (Roberts, 2005).

On vegetable juice, sporulation was so dense that the pattern of growth could not be determined (Roberts, 2005). Conidia produced on vegetable juice were more heavily pigmented, but otherwise similar to those produced on PCA, measuring 37.7-55.4 x 11.7-15.0 µm (Roberts, 2005).

Cluster analysis of combined RAPD (random amplified polymorphic DNA) fragments showed that *A. yaliinficiens* isolates are clearly different to other *Alternaria* species, and differences between *A. yaliinficiens* isolates suggest they may even represent more than one species (Roberts, 2005). The genetic composition of DNA produced from PCR (polymerase chain reaction) gels of isolates of *A. yaliinficiens* is different to that of *A. mali* and *A. gaisen* (Roberts, 2005). In contrast, other molecular research found that the putative *A. yaliinficiens* is indistinguishable from other *Alternaria* species, based on genetic sequences in the 5.8s rDNA (ribosomal DNA) and ITS (internal transcribed spacer) regions (AQSIQ, 2005).

Pathogenicity experiments showed that lesions produced by *A. yaliinficiens* were similar to those produced by other *Alternaria* species on wound-inoculated Ya Li pear fruit (Roberts, 2005). Lesions developed rapidly at room temperature, and enlarged from approximately 2-5 cm at 7 days to approximately 5-8 cm after 14 days (Roberts, 2005). The margins of lesions produced by *A. yaliinficiens* are less broad than those produced by isolates of *A. alternata* (Roberts, 2005).

Stems of Chinese Ya Li pear fruit can also be affected by dark brown to black, shiny lesions. These lead to progressive collapse of the stem as the infection progresses towards the fruit (Roberts, 2005). Sporulation typically occurs from scattered clusters, which eventually join to form large, velvety lesions (Roberts, 2005).

No research has been undertaken concerning the control of *A. yaliinficiens*. However, similarities between all *Alternaria* species suggest that existing control measures for *Alternaria* are likely to be effective for controlling *A. yaliinficiens*.

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2.2.2 European pear rust

Gymnosporangium sabinae (Dicks) G. Winter

Synonym(s): *Gymnosporangium fuscum* DC.; *Puccinia juniperi* Pers.; *Roestelia cancellata* [anamorph] Rebent (CAB International, 2004).

Host(s): Restricted mainly to *Pyrus* (pear) species (Rosaceae) and *Juniperus* species (Cupressaceae) (CAB International, 2004). *G. sabinae* is a rust fungus that passes different stages of its life history on different hosts; it requires *Juniperus* species and members of the Rosaceae (mainly *Pyrus* species) to complete its life cycle (CAB International, 2005).

Part(s) of plant affected: Juniper: leaves and stems (CAB International, 2004; Laundon, 1977). Pear: leaves, stem and young fruit (CAB International, 2004; Laundon, 1977). *Gymnosporangium sabinae* can be carried on fruit, stems and leaves of infected plants during trade and transport (CAB International, 2004).

Distribution: *G. sabinae* originates from central and southern Europe (CAB International, 2004). It is also present in Algeria, Belgium, Britain, Canada, China (Shaanxi), Denmark, Lebanon, Morocco, Netherlands, Norway, Sweden, Syria, Turkey and the USA (Alabama, California) (CAB International, 2004; Laundon, 1977; McCain, 1961; Wang & Guo, 1985).

Biology: European pear rust is a fungus that requires *Juniperus* hosts to complete its life cycle (CAB International, 2004). Telia are produced on cankers on juniper stems in spring. When conditions are favourable, the telia germinate where they are and produce basidia which then produce basidiospores (CAB International, 2004). Basidiospores are spread by wind onto nearby pear trees and give rise to pycnia on the upper surface of pear leaves or occasionally on young fruit (CAB International, 2004). If a thin film of water is present on the plant surface, the basidiospores will germinate (Aldwinckle, 1990a) and give rise to aeciospores which are produced inside tubular protective sheaths (aecia) on the underside of the leaf (CAB International, 2004). Fruiting bodies on pear leaves are the most obvious symptoms. Leaf or fruit infection of pears does not continue after infected leaves or fruit have fallen. Aecia of *G. sabinae* can also cause cankers to form on pear branches (CAB International, 2004). Aecial cankers on pear stems are perennial and capable of either producing infested shoots with pycnia or aecia (Hunt & O'Reilly, 1978). Most of these die out within 2 years (Hunt & O'Reilly, 1978). Aeciospores are released when the peridium of the aecia ruptures, and they can be carried by wind to juniper plants (CAB International, 2004).

The known incidence of infection varies between studies. Hilber *et al.* (1990) reported that in experiments teliospores of *G. sabinae* germinated at temperatures between 10 and 25°C (optimum 15-20°C) and basidiospores germinated at temperatures between 5 and 25°C (optimum 20°C). Effects of temperature, inoculum concentration and leaf wetness period (LWP) on infection rates were studied on leaves of *Pyrus* sp. pears (cv. Kirchensaller) seedlings in natural conditions (Hilber *et al.*, 1990). The optimum temperature for infection was 15°C (Hilber *et al.*, 1990). Basidiospores, sprayed on leaves at a concentration of 2×10^4 spores/mL, caused very severe infections at 15°C and a LWP of 12h (Hilber *et al.*, 1990). Mild infections were observed after a LWP of 7h at 4°C, 5h at 10°C or 3h at 15°C, moderate infections after 4h LWP at 20°C, and severe to very severe infections after 14h LWP at 4°C, 10h at 10°C, 5h at 15°C and 7h at 20°C (Hilber *et al.*, 1990). No infection occurred at or above 25°C (Hilber *et al.*, 1990).

In Turkey, the incidence of infection on pear fruit varied from 4 to 100%, resulting in yield losses of 9 to 100% (Dinc & Karaca, 1975). Basidiospore infections occurred from mid-April to early May in Turkey, and the incubation period on leaves was 9-26 days (Dinc & Karaca, 1975). Development time from production of spermagonia to aeciospores was 147-159 days after initial infection (Dinc & Karaca, 1975). Under natural conditions aeciospores are dispersed by wind to plants of *Juniperus* species, where they can remain dormant throughout winter (Vukovits, 1979) for 5-6 months until early spring (Dinc & Karaca, 1975). Frequency of occurrence on pear plants was related to the distance from juniper plants, obstacles, wind direction and susceptibility of the pear variety (Dinc & Karaca, 1975).

Control of *G. sabinae* in the field has been achieved using mancozeb sprays (Vukovits, 1979), and in experiments the fungicides triforine and ziram were also effective (Mijuskovic, 1979).

Economic importance: *G. sabinae* is considered a serious disease of pears in Europe, parts of Asia and north Africa (Aldwinckle, 1990b). *G. sabinae* has also been designated the most important pear rust in Europe (CMI, 1977). In western North America, *G. sabinae* was more damaging than in Europe (CAB International, 2004). Infection of young fruit causes fruit drop and a reduction in pear fruit yield. *G. sabinae* infects leaves and stems of *Juniper*, and leaves, stems and immature fruit of pears (CAB International, 2004; Laundon, 1977).

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APPENDIX – 3: Amended Import Protocol – Ya Pear Fruit from China to Australia (January 2003)

Appendix 3: Amended import protocol – Ya Pear fruit from China to Australia (January 2003)

Item 1 Registration and submission of information

Ya pear fruit for export to Australia must be sourced from AQSIQ registered orchards in designated export areas and be packed in AQSIQ registered packing houses in the designated export areas. AQSIQ must register all export orchards and packing houses. All individual export orchards must be numbered to enable trace back in the case of non-compliance. Maps showing the location and registration number of each export orchard and packing house are to be provided to BA by AQSIQ before commencement of trade each year.

Item 2. Pest management program and general surveillance

AQSIQ must ensure that export orchards are subject to field sanitation and control measures against quarantine pests and diseases in List 1 (Section 8-Revised Summary of Quarantine Pests with High Risk Potential for Australia) of the final IRA. These controls must provide regulatory assurance that export orchards are essentially free from pests of quarantine concern to Australia. Details of the pest control program must be provided to BA by AQSIQ before commencement of trade. AQSIQ must provide a revised copy of the pest management program at pre-clearance inspection to the AQIS inspector if there is any change to the pest control program.

Detection/monitoring surveys for pests and diseases must be conducted by AQSIQ in orchards registered for export within the designated areas. AQSIQ will submit the results using a standard reporting format to BA. These pests and diseases must include fruit flies (*Bactrocera* spp.), *Euzophera pyriella,* brown rot (*Monilinia fructigena*), black spot (*Alternaria gaisen*), pear scab (*Venturia nashicola*), Japanese pear rust (*Gymnosporangium asiaticum*), physalospora canker (*Botryosphaeria berengeriana* f.sp. *piricola* (syn. *Physalospora piricola*), and fire blight (*Erwinia amylovora*) or related species. If any other exotic pest or disease of quarantine concern to Australia is detected then BA must be notified immediately for appropriate action to be taken.

AQSIQ must ensure that telial hosts (*Juniperus chinensis, J. procumbens*) of Japanese pear rust (*Gymnosporangium asiaticum*) within 2 km of registered orchards are removed. If Japanese pear rust is found, fruit from the export orchards within 2km of the infected site will not be accepted into Australia.

The designated export areas must be free from fire blight (*Erwinia amylovora*) or related species. If fire blight is found AQSIQ must immediately inform BA and imports will be suspended pending an investigation. If physalospora canker is found all fruit from orchards whose fruit comprised that ‘lot’ will be rejected.

Item 3 Fruit fly monitoring

The designated areas from which Ya pear fruit is sourced for export to Australia (i.e. export orchards, packing houses and the surrounding area) must have a pest monitoring system in place for fruit flies (Tephritidae). The traps must consist of cue lure, trimedlure and methyl eugenol.

AQSIQ must continue the current fruit fly monitoring program for Tephritidae already being carried out in Hebei Province with the addition of at least one methyl eugenol trap being placed in each export orchard and any villages present.

Summary data including number and location of traps, data on trap catches, and species caught for all fruit fly traps (methyl eugenol, cue lure, and trimedlure) is to be provided to the AQIS pre-clearance inspector.

AQSIQ will notify BA of the detection of any species of economically important fruit flies within 48 hours of detection. AQIS will assess the species and number of individual flies detected and the circumstances of the detection. AQIS will advise AQSIQ of action to be taken. If fruit flies are detected at pre-clearance inspection trade will stop immediately pending the outcome of an investigation.

Item 4 Inspection of orchards

AQSIQ must inspect all export orchards and a sample of non-export orchards in and outside of the export area and must monitor the levels of pests of concern.

1. If brown rot is detected in any designated export area, fruit from that export area will not be permitted entry into Australia.
2. Orchards infected with pear scab will not be permitted to export fruit.
3. If the level of black spot exceeds a threshold of 0.5% after orchard inspection, those orchards will be excluded from the export program.

Item 5 AQSIQ to notify BA immediately if unusual weather conditions occur resulting in brown rot, black spot or scab diseases

Item 6 Bagging of fruit and storage

Bags must be placed over fruit when the fruit is no more than 2.5 cm in diameter. Fruit must be protected by bags to minimise the risk of exposure to diseases and pests. Export fruit must be clearly identifiable from domestic fruit. Only fruit with intact bags will be permitted for export to Australia and this fruit is not to be mixed or stored with non-export fruit. No fallen fruit is to be collected for export.

Item 7 Pre-harvest inspection

Joint inspection by AQSIQ and the AQIS inspector before harvest must ensure that field control programs are efficacious. The inspection must ensure that bags are intact, only bagged fruit are harvested, and that packing houses have an appropriate level of hygiene. The AQIS inspector must check inspection and sampling facilities, results of detection surveys, fruit fly trap records for the current season and traps if appropriate, and will determine the need to change the intensity of inspection at pre-clearance if necessary.

Item 8 Pre-clearance inspection or equivalent measures

All packing houses must be registered by AQSIQ. Packing houses must be situated within the area trapped for fruit flies. If movement of fruit is required from orchard to packing house through an untrapped area the fruit must remain within intact bags and be covered by a tarpaulin. Only fruit that meets export conditions, set out in items 1-7, with bags

intact will be delivered to the packing house and must be identified by registered orchard number. The packing area must be well lit. Bags must be removed in the packing house away from the packing line. During the Ya pear fruit packing period for export to Australia, no fruit for the domestic market is to be packed.

The fruit must be sampled in accordance with the agreed sampling plan (600 fruit per 'lot' containing > 1000 fruit; 450 for 1000 fruit or less), for visual joint inspection by AQSIQ and AQIS inspectors with the AQIS inspector determining the acceptance or rejection of fruit. Only mature, unblemished fruit may be selected for export and the inspection procedures must ensure that the Ya pear fruit is free from pests or diseases of concern to Australia and any live insects, mites, leaves, twigs and soil. Culled fruit will be removed from the packing house at the end of each day. AQIS and/or AQSIQ may further examine culled fruit for pests. Action must be taken on all quarantine pests if detected and AQSIQ technical specialists, or their nominated agents will identify all pests detected to species level, and this information forwarded to AQIS. Duplicate specimens of detected pests, if available, must be given to the AQIS inspector at the time of pre-clearance. Exports will not be permitted until the identification is completed and information sent to AQIS for approval.

An inspection 'lot' is all pear fruit harvested and packed for export to Australia each day by each orchard ("grower") or as otherwise agreed by AQIS and AQSIQ. If an inspection 'lot' is rejected due to pests or diseases in List 1. Quarantine Pests with a High Risk Potential for Australia, Final IRA, Section 8, any more fruit from that 'lot' must be withdrawn from further inspection. If an inspection 'lot' is rejected due to quarantine pests or diseases with a low or moderate risk potential for Australia (Final IRA, Section 7. Pests Associated with Ya pear in China - Table 1), the offending grower's fruit will be removed from the 'lot', and the balance of the consignment reinspected in accordance with the sampling plan. Fruit from the failed grower may be reconditioned and reinspected. A registered orchard, which has one rejection, will be permitted to submit further 'lots' for the season but if a second rejection occurs that orchard must be withdrawn from the Australian program.

AQSIQ must use new cardboard boxes and cartons. No packing material of plant origin is to be used (eg. straw); only processed or synthetic packing material can be used. When packed fruit is to be transported it must be secured using one of the following methods:

1. fruit must be packed and directly transferred into a shipping container, which must be sealed with a AQSIQ seal and not opened until the container reaches its destination;
2. fruit must be packed into cartons with screened ventilation holes; the screening mesh size must not exceed 1.6mm; or
3. fruit must be packed into cartons and the pallet of cartons must be shrink wrapped in plastic.

All cartons must be marked "For Australia", labelled with 'lot' number, orchard registration numbers, packing house number, number of cartons per 'lot' and date. Alternatively, for palletised "integral" consignments, which have been strapped and secured the information marked on the cartons must be provided in a pallet card. AQIS-inspected and cleared fruit for export to Australia must be stored under security and segregated from all other fruit in a cold store maintained at 1-3°C until loaded into containers.

AQSIQ must ensure that records are properly kept to facilitate auditing of fruit during or after storage and that container doors are sealed after loading.

Item 9 Phytosanitary certification

Upon completion of fruit sampling and inspection, a master phytosanitary certificate is to be issued by AQSIQ for each 'lot', bearing the appropriate 'lot' numbers, orchard registration numbers, packing house number, number of cartons per 'lot' and date. This document must be counter-signed and dated by the AQIS pre-clearance inspector. The phytosanitary certificate is to bear the additional declaration "Produced and inspected under the Ya pear arrangement between AQSIQ and BA".

After the AQIS inspector leaves:

- For each shipment a new phytosanitary certificate, specifying the 'lots' covered by it, cartons per 'lot' and the container and seal number must be issued by AQSIQ.
- Attached to this phytosanitary certificate must be a copy of the master phytosanitary certificate jointly signed by AQSIQ and the AQIS pre-clearance inspector during pre-clearance.

Item 10 Verification of consignment in Australia

AQIS reserves the right to examine relevant certification and seals at the port of arrival in Australia. If the certification does not conform or the seals on the containers are damaged, AQIS reserves the right to have the Ya pear fruit returned to China, re-exported, or ordered to be destroyed. AQIS will inform AQSIQ of action including any intention to suspend importation.

Item 11 Visits

An AQIS inspector must visit China in each year of trade for pre-clearance inspection, both in the field and packing house. The Chinese side will pay fees for the AQIS officer to monitor the implementation of importation requirements, surveys and/or pre-clearance inspection.

Item 12 Review of requirements

BA/AQIS reserves the right to review the agreement if this is deemed necessary.

If brown rot, black spot or scab is intercepted on imported fruit, BA reserves the right to implement remedial measures as deemed necessary before trade commences next season. The remedial measures could be petal testing for brown rot and black spot and flower cluster examination for scab, latent tests or other measures as deemed necessary.