



Import Risk Analysis (IRA) on Fresh Banana Fruit from the Philippines



Issues Paper

2 May 2001



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GLOSSARY OF TERMS AND ABBREVIATIONS

AFFA.....	Department of Agriculture, Fisheries and Forestry - Australia
ALOP.....	appropriate level of protection
AQIS.....	Australian Quarantine and Inspection Service
area.....	an officially defined country, part of a country or all or parts of several countries
BA.....	Biosecurity Australia
bananas.....	fresh banana fruit
BPI.....	Bureau of Plant Industry (Philippines)
control (of a pest).....	Suppression, containment or eradication of a pest population
CSIRO.....	Commonwealth Scientific and Industrial Research Organisation
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
entry potential.....	likelihood of the entry of a pest
establishment potential.....	likelihood of the establishment of a pest
establishment.....	the perpetuation, for the foreseeable future, of a pest within an area after entry
FAO.....	Food and Agriculture Organization of the United Nations
fresh.....	not dried, deep-frozen or otherwise conserved
GATT.....	General Agreement on Tariffs and Trade
introduction potential.....	likelihood of the introduction of a pest
introduction.....	entry of a pest resulting in its establishment
IPPC.....	International Plant Protection Convention, as deposited in 1951 with FAO in Rome and as subsequently amended
IRA.....	import risk analysis
ISPM.....	International Standard on Phytosanitary Measures
official.....	established, authorised or performed by a National Plant Protection Organization
official control (of a pest).....	control of a pest established, authorised or performed by a National Plant Protection Organization

pathway.....	any means that allows the entry or spread of a pest
PBPM	Plant Biosecurity Policy Memorandum
pest	any species, strain or biotype of plant, animal, or pathogenic agent, injurious to plants or plant products
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 (PRA)	pest risk assessment and pest risk management
pest risk assessment.....	determination of whether a pest is a quarantine pest and evaluation of its introduction potential
pest risk management.....	the decision-making process of reducing the risk of introduction of a quarantine pest
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
PQPM.....	Plant Quarantine Policy Memorandum
PRA.....	pest risk analysis
PRA area.....	area in relation to which a pest risk analysis is conducted
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
spread potential.....	likelihood of the spread of a pest
spread.....	Expansion of the geographical distribution of a pest within an area
SPS.....	sanitary and phytosanitary
SPS Agreement.....	WTO Agreement on the Application of Sanitary and Phytosanitary Measures
WTO.....	World Trade Organization

EXECUTIVE SUMMARY

The Commonwealth Department of Agriculture, Fisheries and Forestry - Australia (AFFA) is considering a market access proposal for the importation of fresh banana fruit (bananas) from the Philippines. AFFA has established a risk analysis panel (RAP) for conducting an import risk analysis (IRA) on the proposal following the non-routine pathway outlined in *The AQIS Import Risk Analysis Process Handbook* (the Handbook) (AQIS, 1998). The RAP has established three technical working groups (TWGs) to consider specific aspects pertinent to the IRA: pathogens; arthropods; and horticulture, environment and operations. The TWGs will gather scientific and technical information on banana pests and management measures for quarantine pests for consideration by the RAP.

This Issues Paper contains the following information:

- background information on administration issues, AFFA's frameworks for quarantine policy and IRA, the international framework for trade in animal and plant products, and Australia's current policy for the importation of bananas;
- a preliminary pest list of Philippines bananas and an outline of the methodology for pest categorisation; and
- an outline of further steps in the IRA process.

The panel, assisted by TWGs as necessary, will conduct the risk analysis taking into account stakeholder comments received on the Issues Paper and consultations with stakeholders. The draft IRA paper will cover technical issues related to pest risk assessment, pest risk management and a preliminary view on which risk management measures would achieve Australia's appropriate level of protection (ALOP).

The panel will consult and meet with relevant experts and stakeholders as necessary in the course of preparing the draft IRA paper. Stakeholders are strongly encouraged to contribute to the IRA by providing relevant technical information and raising relevant issues as early as possible, preferably while commenting on the Issues Paper or during meetings with the panel before the preparation of the draft IRA paper. Stakeholders will be invited to comment on the draft IRA paper.

After considering all technical issues, including stakeholder comments on the draft IRA paper, the RAP will finalise the IRA recommendations consistent with Australia's highly conservative ALOP and international rights and obligations under the SPS Agreement.

The RAP will submit its recommendations to the appropriate Deputy Secretary in AFFA for consideration. The Deputy Secretary will consider the recommendations and make the final determination. The Deputy Secretary's determination and the final IRA will be sent to all stakeholders. Any stakeholder of the opinion that the process outlined in the Handbook has not been properly followed, including that the analysis failed to consider a significant body of relevant scientific or technical information, may appeal to the Director of Animal and Plant Quarantine. If the appeal is upheld, the RAP will rectify the deficiency. If the appeal is rejected, the policy will be adopted.

BACKGROUND TO THIS IMPORT RISK ANALYSIS

The Philippines Bureau of Plant Industry (BPI) has been seeking market access for exports of bananas from the Philippines to Australia since 1995. In January of that year, BPI provided AQIS with a list of pests and diseases of bananas as part of a general market access request for exports of bananas, mangoes and pineapples to Australia. In June 1996, BPI and AQIS mutually resolved that mango was the top priority for the Philippines, and accordingly that IRAs for bananas and pineapples would be progressed in due course.

At a meeting of the Philippines-Australia Joint Commission in Canberra in May 1999, the Philippines' authorities indicated that their next market access priority was bananas following the imminent completion of market access negotiations for exports of Philippine mangoes to Australia. Subsequently AQIS wrote to BPI requesting information, as outlined in Annex 3 of the Handbook, on pests and diseases of bananas.

AQIS notified stakeholders in March 2000 of the import proposal for bananas from the Philippines (PQPM 2000/01)¹.

At a meeting with an Australian government delegation in Manila in May 2000, the Philippines' quarantine authorities provided the information requested by AQIS in July 1999.

In June 2000, AQIS initiated the IRA on bananas by proposing a non-routine IRA (PBPM 2000/10)². Comments were sought from stakeholders on the proposed process. The comment period closed on 31 July 2000. Thirteen stakeholders responded: 12 supported the use of a non-routine approach to the IRA and one said that no IRA should be conducted. Following consideration of comments, the newly formed Biosecurity Australia (formerly a part of AQIS) confirmed the non-routine IRA process and sought stakeholder comments in October 2000 on the scope and timing of the IRA and the proposed membership of the RAP (PBPM 2000/22)³.

¹ Available at <http://www.aqis.gov.au/docs/plpolicy/pqpm0001.htm>

² Available at http://www.affa.gov.au/docs/market_access/biosecurity/plant/pqpm0010.html

³ Available at http://www.affa.gov.au/docs/market_access/biosecurity/plant/pbpm0022.html

Biosecurity Australia issued a further memorandum for stakeholder comment in January 2001 nominating an extra panel member with suitable industry experience. Following this further consultation, the RAP membership was finalised on 19 January 2001.

The RAP will consider the stakeholder comments on Biosecurity Australia's memoranda; PBPM 2000/10 and PBPM 2000/22 issued in June and October 2000, respectively.

ADMINISTRATION

Timetable

The tentative time frame for completion of the IRA is mid 2002.

Further steps in the IRA process are outlined in the last section of this paper. Given the nature of the task, the RAP considers it is not prudent to give definitive time frames for these steps at this stage. For the same reason it is not possible for the RAP to specify at this time just when stakeholder meetings are likely to occur. Stakeholders will be advised of the key forthcoming events throughout the process in a timely manner.

Scope

The IRA will assess the phytosanitary risks associated with the importation of bananas from the Philippines for human consumption. The IRA will also consider and evaluate measures and procedures to manage these risks to an acceptably low level, which is consistent with Australia's ALOP.

The IRA will consider imports of fresh fruit of varieties of Cavendish (Extra Dwarf, Giant Cavendish, Grand Nain and Williams) and Gros Michel from the Mindanao region (Davao, Cotabato and Bukidnon) in the Philippines. According to the information presented in the Philippines' submission, it is expected that export bananas will be in the mature hard green state. The RAP will clarify what is meant by "mature hard green" and define maturity standards for bananas of the nominated export varieties, particularly because of their relevance to the risk of introduction of quarantine fruit flies. The RAP will also clarify whether Gros Michel bananas would be exported from the Philippines given that the Australian banana industry believes that the Philippines no longer grow these bananas on a commercial scale. It is also important to clarify this point as Gros Michel bananas may occasionally contain

viable seeds and, therefore, present a different risk profile as compared with Cavendish bananas, which do not set viable seed. The RAP will also seek further clarification of the boundaries of the proposed export areas. Following further consideration of the Philippines' market access submission, the RAP will provide further details in the draft IRA paper regarding potential pathways, for example bananas and associated materials, for the introduction of quarantine pests.

Risk Analysis Panel

In accordance with the non-routine IRA process described in the Handbook, a risk analysis panel has been established. The RAP membership is:

Dr Sharan Singh (Chair)	A/g Senior Manager, Plant Biosecurity, Biosecurity Australia
Dr Rob Allen	Principal Policy Officer, Plant Health, Queensland Department of Primary Industries
Dr Bryan Cantrell	Principal Policy Officer, Plant Health, Queensland Department of Primary Industries
Mr Bob Paton	Policy Officer, Market Access, NSW Agriculture
Mr David Peasley	Horticultural Consultant
Mr Mike Robbins	Manager, Grain, Seed and Nursery Stock, AQIS, Canberra

Plant Biosecurity is providing a technical secretariat for the panel. The RAP will make recommendations on the import proposal to the appropriate Deputy Secretary in AFFA.

The RAP will not be responsible for addressing issues that fall outside the scope of the risk analysis, such as the potential economic impact on the Australian banana industry of competition arising from importation of fresh bananas from the Philippines.

AFFA may vary the membership of the RAP if circumstances warrant such action, for example, when a member is unable to continue this work owing to other commitments. Stakeholders will be advised if such change is necessary. AFFA will decide on a needs basis, the timing and duration of the RAP's work. The RAP will consult with stakeholders, TWGs and other relevant experts as needed.

Terms of reference of the risk analysis panel

1. To review scientific literature, risk analyses and other relevant information (including in particular the data provided by the Philippines' authorities) to identify quarantine pests that could be in the import pathway (fresh banana fruit and associated materials) consistent with the International Standards for Phytosanitary Measures (ISPM), developed under the auspices of the International Plant Protection Convention (IPPC), and in particular assess the potential for quarantine pests to:
 - enter, establish and spread in Australia; and
 - cause economic damage, eg, type of damage, crop losses, loss of export markets, increases in control costs, effects on ongoing integrated pest management (IPM) programmes, environmental damage, capacity to act as a vector for other pests and perceived social costs such as unemployment.
2. To consider risks of possible imports from the Philippines of fresh banana fruit and associated material such as banana leaf trash and floral remnants to Australia's environment.
3. To consider and recommend risk management measures for the identified quarantine risks consistent with Australian government policy, the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) and relevant international standards, including the FAO International Standards for Phytosanitary Measures (ISPMs).
4. To establish and oversee Technical Working Groups (TWGs) as required for addressing the above terms of reference.
5. To report its findings to the appropriate Deputy Secretary of AFFA.

Technical Working Groups

The RAP has established the following Technical Working Groups (TWGs) on specific aspects of the IRA.

TWG 1: Pathogens Technical Working Group

TWG 2: Arthropods Technical Working Group

TWG 3: Horticulture, Environment and Operations Technical Working Group

The role of the TWGs will be to collate relevant scientific and technical reference material, which will be considered, among other things, by the RAP in the preparation of the draft and final IRA papers.

A RAP member chairs each TWG. The RAP may vary the membership of the TWGs if circumstances warrant such action, for example, when a member is unable to continue this work owing to other commitments, or if additional resources are required to undertake specific tasks. The RAP will decide on a needs basis the timing and duration of the TWGs' work. The TWGs will consult with specialists with relevant expertise as needed.

The membership and terms of reference of the TWGs are outlined below. The curricula vitae of the TWG members are provided in Appendix 4.

TWG 1: Pathogens Technical Working Group

Membership

Dr Sharan Singh (Chair)	A/g Senior Manager, Plant Biosecurity, Biosecurity Australia
Dr Chris Hayward	Consultant, Bacteriologist
Mr Ron Peterson	Principal Plant Pathologist, Queensland Department of Primary Industries
Dr John Thomas	Principal Plant Pathologist, Queensland Department of Primary Industries

Terms of reference

1. To identify quarantine pathogens associated with possible imports of fresh banana fruit and associated material such as banana leaf trash and floral remnants from the Philippines consistent with the International Standards for Phytosanitary Measures (ISPMs), Guidelines for Pest Risk Analysis, developed under the auspices of the International Plant Protection Convention (IPPC), and in particular assess the potential of these pathogens to:
 - enter, establish and spread in Australia; and

- cause economic damage, eg, type of damage, crop losses, loss of export markets, increases in control costs, effects on ongoing integrated pest management (IPM) programmes, environmental damage, capacity to act as a vector for other pests and perceived social costs such as unemployment.
- 2. To consider risk management measures consistent with the Australian government policy, the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) and relevant international standards, including the ISPMs.
- 3. To liaise on relevant issues with other Technical Working Groups (TWGs) established under the Risk Analysis Panel (RAP) on the importation of bananas from the Philippines, and other national and international technical experts, as necessary.
- 4. To report its findings to the RAP.

TWG 2: Arthropods Technical Working Group

Membership

Mr Bob Paton (Chair)	Policy Officer, Market Access, NSW Agriculture
Dr Bryan Cantrell	Principal Policy Officer (Plant Health), Queensland Department of Primary Industries
Mr Bruno Pinese	Senior Entomologist, Queensland Department of Primary Industries

Terms of reference

1. To identify quarantine arthropod pests associated with possible imports of fresh banana fruit and associated material such as banana leaf trash and floral remnants from the Philippines consistent with the International Standards for Phytosanitary Measures (ISPMs), Guidelines for Pest Risk Analysis, developed under the auspices of the International Plant Protection Convention (IPPC), and in particular assess the potential of these pests to:
 - enter, establish and spread in Australia; and
 - cause economic damage, eg, type of damage, crop losses, loss of export

markets, increases in control costs, effects on ongoing integrated pest management (IPM) programmes, environmental damage, capacity to act as a vector for other pests and perceived social costs such as unemployment.

2. To consider risk management measures consistent with the Australian government policy, the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) and relevant international standards, including the ISPMs.
3. To liaise on relevant issues with other Technical Working Groups (TWGs) established under the Risk Analysis Panel (RAP) on the importation of fresh banana fruit from the Philippines, and other national and international technical experts, as necessary.
4. To report its findings to the RAP.

TWG 3: Horticulture, Environment and Operations

Membership

Mr David Peasley (Chair)	Horticultural Consultant
Dr Gordon Guymer	Manager, Biodiversity Assessment and Services, Queensland Environmental Protection Agency
Mr Mike Robbins	Manager, Grain, Seed and Nursery Stock, AQIS, Canberra

Terms of reference

1. To collect relevant information on banana industries in Australia and the Philippines, including production, acreage, and trade statistics.
2. To identify and evaluate environmental risks, particularly for Australian native fauna and flora, associated with the importation of fresh banana fruit and associated materials such as banana leaf trash and floral remnants from the Philippines.
3. To identify operational issues including; export chain, inspection, testing and certification procedures and any other requirements relevant to the importation of bananas from the Philippines.

4. To consider various risk management measures consistent with the Australian government policy, the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) and relevant international standards, including the FAO International Standards for Phytosanitary Measures.
5. To liaise with other Technical Working Groups (TWGs) and national and international technical experts, as necessary, on relevant issues identified by other TWGs and this working group.
6. To consider the operational feasibility of procedures for the implementation of management measures identified by other TWGs and propose operational procedures.
7. To report its findings to the RAP.

QUARANTINE FRAMEWORK IN AUSTRALIA

Legislative and conceptual framework

AFFA's objective is to adopt quarantine policies that provide the health safeguards required by government policy in the least trade-restrictive way, based on international standards wherever appropriate. In developing and reviewing quarantine policies, pest risks associated with importations are analysed using import risk analysis, a structured, transparent and science-based process.

The *Quarantine Act 1908*⁴ and its subordinate legislation, including *Quarantine Proclamation 1998* (QP 1998)⁵, are the legislative basis of animal and plant quarantine in Australia. The *Quarantine Amendment Act 1999* is a major revision to the Quarantine Act.

Section 4 of the Quarantine Act says that **quarantine** includes, but is not limited to, measures:

- (a) for, or in relation to, the examination, exclusion, detention, observation, segregation, isolation, protection, treatment and regulation of vessels, installations, human beings, animals, plants or other goods

⁴ Available at <http://scaletext.law.gov.au/html/pasteact/0/71/top.htm>

⁵ Available at <http://scaleplus.law.gov.au/html/instruments/0/3/0/IN000020.htm>

or things; and

- (b) having as their object the prevention or control of the introduction, establishment or spread of diseases or pests that will or could cause significant damage to human beings, animals, plants, other aspects of the environment or economic activities.

Subsection 13(1) of the Quarantine Act provides, among other things, that the Governor-General in Council may, by proclamation, prohibit the importation into Australia of any articles or things likely to introduce, establish or spread any disease or pest affecting persons, animals or plants. The Governor-General may apply this power of prohibition generally or subject to any specified conditions or restrictions.

For articles or things prohibited by proclamation, the Director of Animal and Plant Quarantine may permit entry of products on an unrestricted basis or subject to compliance with conditions, which are normally specified on a permit. An IRA provides the scientific and technical basis for quarantine policies that are referred to by a decision-maker when deciding whether an import may be permitted and, if so, the conditions to be applied.

The matters to be considered when deciding whether to issue a permit are set out in section 70 of QP 1998 (as amended in 2000). In deciding whether to grant a permit to import the Director of Animal and Plant Quarantine:

- (a) must consider the level of quarantine risk if the permit were granted;
- (b) must consider whether, if the permit were granted, the imposition of conditions on it would be necessary to limit the level of quarantine risk to one that is acceptably low; and
- (c) may take into account anything else that he or she knows that is relevant.

Level of quarantine risk is defined in section 5D of the Quarantine Act. A reference in this Act to a level of quarantine risk is a reference to:

- (a) the probability of: a disease or pest being introduced, established or spread in Australia or the Cocos Islands; and the disease or pest causing harm to human beings, animals, plants, other aspects of the environment, or economic activities; and
- (b) the probable extent of the harm.

The actions of the Director of Animal and Plant Quarantine or his delegate in reaching a decision under the Quarantine Act take into account the risk of significant harm to the environment.

The RAP is well aware of the need to address the environmental risks associated with the possible importation of fresh bananas from the Philippines and has accordingly established a technical working group with expertise to duly consider this aspect of the IRA. The RAP is also committed to liaising with Environment Australia throughout the IRA process as appropriate.

IRA framework

In order to achieve a consistently objective approach, import risk analyses carried out by AFFA follow the principles laid out in the publication, *The AQIS Import Risk Analysis Process Handbook* (AQIS, 1998). This process is consistent with Australia's obligations under the SPS Agreement, and relevant recommendations of the International Plant Protection Convention (IPPC). Copies of the Handbook may be obtained from AFFA, or viewed on the AFFA website⁶.

Proposals requiring an IRA - those involving significant variations in established policy - are addressed via either the routine or non-routine process. Less complex changes to or reviews of established policy are handled through the routine process while the non-routine process is applied where there are potentially significant quarantine risks to be evaluated (not previously studied by AFFA) and where the analysis is likely to be large and technically complex.

INTERNATIONAL FRAMEWORK

World Trade Organization

As a member of the World Trade Organization (WTO), Australia has certain rights and obligations under the WTO Agreement on the Application of Sanitary and Phytosanitary Measures - the so-called 'SPS Agreement'. The SPS Agreement recognises the standards, guidelines and recommendations developed under the auspices of the IPPC (FAO, 1997b) as the relevant international benchmark for pest risk analyses on plants and plant products. Under the SPS Agreement, measures a

⁶ Available at <http://www.affa.gov.au/biosecurityaustralia>

country puts in place are normally based either on an international standard or upon a scientific risk analysis.

A risk analysis must:

- identify the pests whose entry, establishment or spread within its territory a WTO member wants to prevent, as well as the potential biological and economic consequences associated with the entry, establishment or spread of these pests;
- evaluate the likelihood of entry, establishment or spread of these pests, as well as the associated potential biological and economic consequences; and
- evaluate the likelihood of entry, establishment or spread of these pests according to the SPS measures that might be applied.

The SPS Agreement defines ‘appropriate level of sanitary or phytosanitary protection’ as the level of protection deemed appropriate by the member country establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory. Further information on Australia’s rights and obligations arising from the SPS Agreement may be found in the report *National Risk Management and the SPS Agreement* (Wilson and Gascoine, 1999)⁷.

International Plant Protection Convention

Australia is a contracting party to the IPPC and actively contributes to the development of International Standards for Phytosanitary Measures (ISPMs). Of particular relevance to the present IRA are:

- ISPM No. 1: *Principles of Plant Quarantine as Related to International Trade* (FAO, 1995);
- ISPM No. 2: *Guidelines for Pest Risk Analysis*;
- ISPM No. 5: *Glossary of Phytosanitary Terms* (FAO, 1997a);
- ISPM No. 10: *Requirements for the Establishment of Pest Free Places of Production and Pest Free Production Sites* (FAO, 1999); and

⁷ Available at http://www.affa.gov.au/docs/market_access/biosecurity/bde.html

- ISPM titled *Pest Risk Analysis for a Quarantine Pest* (FAO, 2001).

The technical component of this IRA will conform to the guidelines provided in these ISPMs.

AUSTRALIA'S CURRENT QUARANTINE POLICY

International quarantine policy

Imports of fresh banana fruit into Australia for consumption are not allowed from any country.

AQIS conducted a risk analysis on the importation of fresh banana fruit from Ecuador in 1991. Import conditions were not developed because the risk analysis was suspended due to the prospective importer withdrawing the import application. A position paper (AQIS, 1991) was published on this subject. The diseases black Sigatoka and Moko and a number of arthropod pests were identified as of quarantine concern to Australia and further information was required prior to making a decision on the importation of Ecuadorian bananas.

Fresh banana fruit may be imported for in vitro laboratory work under secure quarantine conditions at Quarantine Approved Premises. Strict quarantine conditions are observed for these imports including a requirement that packaging materials and containers must be disposed of by incineration, autoclaving or other methods approved by the Director of Animal and Plant Quarantine. The goods in the total consignment must be securely packaged and directly transported to an AQIS approved facility for laboratory analysis. Samples must be in clean, new packaging and must be free of live insects, prohibited or restricted seeds, soil and other contaminants.

The importation of banana products from a number of countries including the Philippines is permitted. These include cooked, dried and canned/preserved products.

Further details of the importation requirements for bananas and banana products are available in AQIS's Import Conditions Database (ICON)⁸

Domestic arrangements

While the Commonwealth Government is responsible for regulating the movement of

⁸ Available at <http://www.aqis.gov.au/icon/>

plants and their products into and out of Australia, the State/Territory Governments have primary responsibility for plant health controls within Australia. Legislation relating to resource management or plant health may be used by State/Territory Government agencies to control interstate movement of plants and their products.

To prevent spread of black Sigatoka disease, the movement of fresh banana fruit from Torres Strait and far northern Queensland to other parts of Australia is not allowed. Black Sigatoka is periodically detected in north Queensland and quarantine restrictions are put in place to mitigate the risk of the disease spreading to production areas.

Black Sigatoka has recently been detected in the Tully area and quarantine restrictions on the movement of fruit from the affected area have been put in place. Black Sigatoka remains a quarantine disease for Australia because its distribution is restricted and it is being officially controlled. The RAP will include up to date details of the intra- and interstate quarantine requirements for the movement of fresh banana fruit within Australia in the draft IRA paper.

Movement of banana fruit and planting material are subject to intra- and interstate quarantine restrictions, particularly to control spread of black Sigatoka and banana bunchy top diseases. Details of all relevant quarantine procedures will be provided in the draft IRA paper.

Quarantine policy on banana planting material

Imports of banana tissue cultures and seeds are permitted subject to growth in AQIS approved post-entry quarantine premises, testing for viruses, and inspection for pests and diseases. The key quarantinable diseases are:

Moko	<i>Ralstonia solanacearum</i> Race 2
Blood disease	<i>Ralstonia solanacearum</i>
Bugtok disease	<i>Ralstonia solanacearum</i>
Black Sigatoka/black streak	<i>Mycosphaerella fijiensis</i> (syn. <i>M. fijiensis</i> var. <i>difformis</i>)
Panama disease	<i>Fusarium oxysporum</i> f.sp. <i>cubense</i> Race 4
Bunchy top	Banana bunchy top <i>nanavirus</i>
Bract mosaic	Banana bract mosaic <i>potyvirus</i>
Streak	Banana streak <i>badnavirus</i>

BANANA PRODUCTION IN AUSTRALIA

In 1998-99, Australian banana production by some 2500 growers amounted to 225 167 tonnes with a gross value of \$266.3 million (Table 1). Banana production is one of Australia's largest horticultural industries. Australia is a relatively small player in the world banana trade: less than 0.1% of production is exported mainly to the Asia and Pacific region. Recently organically-grown bananas have been exported to Japan and the development of export markets such as New Zealand is being investigated.

Queensland accounted for 77% of the Australian banana production in 1998-99, producing 174 530 tonnes with a value of \$159.1 million. The wet tropical area in north Queensland from Cardwell to Babinda produces 70% of the crop. Banana growing has also expanded outside the traditional wet coast to the dry tropics of the Burdekin delta, the Atherton Tableland and the Mackay/Sarina regions. In southern Queensland bananas are produced in selected coastal areas between Bundaberg and the New South Wales border. This area is linked to a substantial industry extending south to Kempsey in New South Wales where banana is planted on hill slopes to avoid frosts. In 1998-99, NSW produced 34 406 tonnes of bananas with a gross value of \$45.1 million.

In 1998-99, Western Australia produced 10 431 tonnes with a gross value of \$17 million. Seventy percent comes from Carnarvon, and the rest from Kununurra.

The Northern Territory banana producing area is concentrated mainly in the Lambell's Lagoon area, north-east of Darwin. In 1998-99, 5799 tonnes were produced from 261 hectares with a value of \$9.2 million.

Table 1 Australian banana production and gross values

State	Year ended March 1999			
	Area (ha)	Yield (tonnes/ha)	Production (tonnes)	Gross value (\$m)
NSW	2 856	12.0	34 406	45.1
NT	261	22.2	5 799	9.2
Qld	7 897	22.1	174 530	159.1
WA	390	26.7	10 431	17.0
Total	11 405	19.7	225 167	266.3

Australian Bureau of Statistics 2000. Agriculture 1998-99. 7113.0

Further information on the banana industry in Australia will be provided in the draft IRA paper.

METHOD FOR PEST CATEGORISATION

Pest categorisation is a screening or classification phase, with the purpose of grouping pests identified in Stage 1 (*Initiation of the PRA*) as either quarantine pests, or not. The objective of this process is to efficiently screen a complete list of potential quarantine pests to identify those that require in-depth examination in the ensuing risk assessments.

In accordance with ISPMs (FAO, 1996; 2001), pest categorisation is based on the following criteria:

- identity of the pest;
- presence or absence in Australia;
- regulatory status;
- potential for establishment and spread in Australia; and
- potential for economic consequences (including environmental consequences) in Australia.

Identity of the pest

The identity of the pest should be clearly defined to ensure that the assessment is being performed on a distinct organism, and that biological and other information used in the assessment is relevant to the organism in question. If this is not possible because the causal agent of particular symptoms has not yet been fully identified, then it should have been shown to produce consistent symptoms and to be transmissible.

The taxonomic unit for the pest is generally species. The use of a higher or lower taxonomic level should be supported by scientifically sound rationale. In the case of levels below the species, this should include evidence demonstrating that factors such as differences in virulence, host range or vector relationships are significant enough to affect phytosanitary status.

In cases where a vector is involved, the vector may also be considered a pest to the extent that it is associated with the causal organism and is required for transmission of the pest.

Presence or absence in Australia

The pest should be absent from all or a defined part of the PRA area.

Regulatory status

If the pest is present but not widely distributed in Australia, it should be under official control or expected to be under official control in the near future.

Potential of establishment and spread in Australia

Evidence should be available to support the conclusion that the pest could become established or spread in Australia. The PRA area should have ecological/climatic conditions including those in protected conditions suitable for the establishment and spread of the pest where relevant, host species (or near relatives), alternate hosts and vectors should be present in Australia.

Potential for economic consequences in Australia

There should be clear indication that the pest is likely to have an unacceptable economic impact (including environmental impact) in Australia.

For administrative purposes, pest categorisation will be carried out in two stages.

Firstly, a pest list of bananas in the Philippines will be compiled and pests will be categorised as present, absent, or present but not widely distributed and under official control in Australia. This list will be derived from a list of pests provided by the Bureau of Plant Industry, Philippines Department of Agriculture (Appendix 1) and other relevant sources. Following consideration of any technical information from other sources, the RAP will include an up to date pest list in the draft IRA paper. Where there is doubt or contention regarding the distribution or occurrence of a given pest, it will be retained on the list of potential quarantine pests.

The RAP will clarify the occurrence on Philippines' bananas of the pests currently not included in the pest list provided by the Philippines, and assess the quarantine significance of these pests. For example, the quarantine significance of the diseases freckle (*Guignardia musae*) and bugtok (*Ralstonia solanacearum*), fruit flies

(*Bactrocera occipitalis* (Bezzi), *Bactrocera papayae* Drew & Hancock, *Bactrocera philippinensis* Drew & Hancock) and scales (*Aspidiotus coryphae* Cockerell & Robinson, *Aspidiotus destructor* Signoret, *Aspidiotus excisus* Green, *Hemiberlesia palmae* (Morgan & Cockerell) will be considered in the IRA.

The second phase of pest categorisation will hinge on classification of each of the listed pests with regard to its potential to become established in Australia, and the likely severity of its consequences. Establishment and spread potential will be dichotomously classified as ‘feasible’ or not, while consequences will be described as ‘significant’ or not.

The result of pest categorisation will be the identification of quarantine pests associated with fresh banana fruit from the Philippines. Quarantine pests will be subsequently examined in detail in the assessments of introduction potential (the probability of entry, establishment and spread) and consequence.

AN ILLUSTRATION OF PEST CATEGORISATION FOR PHILIPPINES’ BANANAS

The occurrence in Australia of pests associated with Philippines’ bananas, based on a preliminary review by the RAP of the list provided by the Philippines and supplemented by Biosecurity Australia, is summarised in Appendix 2 (Table 5) in order to illustrate the pest categorisation process. Pests that are either absent in Australia, or present but not widely distributed and under official control, are listed in the first column of Table 6. Establishment and spread potential is dichotomously classified as ‘feasible’ or ‘not’, while consequences are described as ‘significant’ or ‘not’.

PEST RISK MANAGEMENT FOR PHILIPPINES’ BANANAS

The RAP will present appropriate risk management measures in the draft IRA paper following consideration of relevant input from TWGs, stakeholders and other sources.

FURTHER STEPS IN THE IRA PROCESS

The following key steps have been planned for this IRA taking into account the process outlined in the Handbook:

- familiarisation field tour of RAP in Queensland and New South Wales to observe banana production, handling and pest management procedures in Australia;
- meetings of RAP with stakeholders to discuss relevant issues after the closing date for comment on the Issues Paper;
- workshops of RAP with stakeholders to discuss the pest lists, pest categorisation and pest management measures for Philippines' bananas prior to finalising the draft IRA document;
- release of the draft IRA paper for stakeholder comment within 60 days;
- stakeholders meetings to explain the draft IRA within the consultation period;
- consideration of stakeholder comments on the draft IRA and consultation with stakeholders as necessary;
- preparation of the final IRA;
- release of the final IRA paper;
- consideration of appeals, if any; and
- if there is no appeal or the appeal is rejected, adoption of appropriate quarantine policy.

Stakeholders will be advised of any significant variations to the process.

The RAP is committed to a thorough risk analysis of the proposed importation of bananas from the Philippines. To complete this task in a timely manner, the RAP is gathering information from a wide range of sources.

The RAP is strongly encouraging all stakeholders to contribute information relevant to the IRA as soon as possible. Your assistance is appreciated. The contact details for stakeholder contributions are provided in the accompanying PBPM 2001/10.⁹

⁹ Available at http://www.affa.gov.au/docs/market_access/biosecurity/plant/pbpm0110.html

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APPENDIX 1: PESTS IDENTIFIED BY THE BUREAU OF PLANT INDUSTRY, PHILIPPINES DEPARTMENT OF AGRICULTURE

Reproduced from BPI (2000)

Table 2 Insect pests of bananas in the Philippines

Common name	Scientific name	Family: Order
Banana leafroller	<i>Pelopidas thrax</i> (L.)	Hesperiidae: Lepidoptera
Saddleback	<i>Thosea sinensis</i> Walker	Limacodidae: Lepidoptera
Bag worms	<i>Eumeta fuscens</i> Snell	Psychidae: Lepidoptera
Bag worms	4 unidentified species	Psychidae: Lepidoptera
Coconut scale	<i>Aspidiotus destructor</i> Sig.	Diaspididae: Homoptera
Black scale	<i>Abgrallaspis palmae</i> Cock.	Diaspididae: Homoptera
Lacebug	<i>Stephanitis typicus</i> L.	Tingidae: Hemiptera
Scab thrips	<i>Thrips florum</i> Schmutz	Thripidae: Thysanoptera
Red rust thrips	<i>Chaetanaphothrips signipennis</i> (Bagnall)	Thripidae: Thysanoptera
Peel scarring weevils	<i>Philicoptus iliganis</i> Heller	Curculionidae: Coleoptera
Peel scarring weevils	<i>Philicoptus</i> sp.	Curculionidae: Coleoptera
Peel scarring weevils	<i>Philicoptus dimissus</i> Heller	Curculionidae: Coleoptera
Gray pineapple mealybug	<i>Dysmicoccus neobrevipes</i> Beardsley	Pseudococcidae: Homoptera
Black soldier fly	<i>Hermetia illuscens</i> (L.)	Stratiomyidae: Diptera
Corn weevil	<i>Cosmopolites sordidus</i> (Germar)	Curculionidae: Coleoptera
Stalk borer	<i>Odioporus longicollis</i> (Oliver)	Curculionidae: Coleoptera
Banana aphid	<i>Pentalonia nigronervosa</i> Coq.	Aphidae: Homoptera

Table 3 Diseases affecting bananas in the Philippines

Common name	Causal Organism
Banana bunchy top virus	Virus
Cucumber mosaic virus	Virus
Banana bract mosaic virus	Virus
Moko	<i>Pseudomonas solanacearum</i>
Sigatoka	<i>Mycosphaerella fijiensis</i>
Cordana	<i>Cordana musae</i>
Panama disease	<i>Fusarium oxysporum</i>
Corm rot	<i>Erwinia carotovora</i>
Anthrachnose	<i>Colletotrichum musae</i>
Crown rot	Several fungi
Speckle	<i>Deightoniella torulosa</i>
Finger rot	<i>Erwinia carotovora carotovora</i>
Pitmark	<i>Pyricularia grisea</i>
Diamond spot	<i>Cercospora hayi</i>

Table 4 Weeds of bananas in the Philippines

Cyprus rotunda	<i>Echinochloa colona</i>	<i>Synedrella nodiflora</i>
<i>Cleome ruidosprema</i>	<i>Commelina diffusa</i>	<i>Mimosa pudica</i>
<i>Centrosema pubescens</i>	<i>Peperonica pellucida</i>	<i>Cryptocum patens</i>
<i>Euphorbia hirta</i>		

APPENDIX 2: PRELIMINARY CATEGORISATION OF PESTS OF BANANAS IN THE PHILIPPINES

**Table 5 Preliminary categorisation of pests of bananas in the Philippines
(conducted by Biosecurity Australia; the RAP will review this pest list categorisation)**

Pest	Occurrence in Philippines	Reference	Occurrence in Australia	Reference	Associated with fruit	Reference	Consider pest
ARTHROPODS							
<i>Chaetanaphothrips signipennis</i> (Thysanoptera: Thripidae) (red rust thrips)	Yes	Pitkin, 1977	Yes	Williams <i>et al.</i> , 1990	Yes	Williams <i>et al.</i> , 1990	*
<i>Cosmopolites sordidus</i> Germar (corm weevil)	Yes	Deang <i>et al.</i> , 1970	Yes	Lindsay, 1993; Pinese, and Piper, 1994	*	Deang <i>et al.</i> , 1970	*
<i>Cryptothelea fuscescens</i> (Lepidoptera: Psychidae) (bagworm)	Yes	Kalshoven and van der Laan, 1981	No	Nielsen <i>et al.</i> , 1996	*	Kalshoven and van der Laan, 1981	*
<i>Dysmicoccus neobrevipes</i> (Homoptera: Pseudococcidae) (grey pineapple mealybug)	Yes	Ben-Dov, 1994	No	Ben-Dov, 1994	Yes	Ben-Dov, 1994	Yes
<i>Erionota thrax</i> (Lepidoptera; Hesperiiidae) (banana skipper)	Yes	De Jong and Treadaway, 1993	No	CABI 2000	*	Dammerman, 1929; Kalshoven and van der Laan, 1981	*

Pest	Occurrence in Philippines	Reference	Occurrence in Australia	Reference	Associated with fruit	Reference	Consider pest
<i>Hemiberlesia palmae</i> (Homoptera: Diaspididae) (black scale)	Yes	Sugimoto, 1994	Yes	Donaldson pers. comm. (QDPI)	*	Sugimoto, 1994	*
<i>Hermetia illucens</i> (Diptera: Stratiomyidae) (black soldier fly)	Yes	Rueda <i>et al.</i> , 1990	Yes	Callan, 1974	Yes	Stephens, 1975	*
<i>Odoiporus longicollis</i> (Coleoptera: Curculionidae) (stalk borer)	Yes	Uichanco, 1936	No	CABI 2000	*	Isahaque, 1978; Dutt and Maiti, 1972	*
<i>Pentalonia nigronervosa</i> (Homoptera: Aphidae) (banana aphid)	Yes	Lomerio and Calilung, 1993	Yes	Lindsay, 1993; Pinese and Piper, 1994	*	Lomerio and Calilung, 1993	*
<i>Philicoptus demissus</i> (Coleoptera: Curculionidae) (peel-scarring weevil)	Yes	Stephens, 1984	No	Stephens, 1984	Yes	Stephens, 1984	Yes
<i>Philicoptus iliganus</i> (Coleoptera: Curculionidae) (peel-scarring weevil)	Yes	Stephens, 1984	No	Stephens, 1984	Yes	Stephens, 1984	Yes
<i>Philicoptus</i> sp. (Coleoptera: Curculionidae) (peel-scarring weevil)	Yes	Stephens, 1984	No	Stephens, 1984	Yes	Stephens, 1984	Yes
<i>Stephanitis typica</i> (Hemiptera: Tingidae) (lacebug)	Yes	Waterhouse, 1993	No	CABI 2000	*	Hoffman, 1935; Tigvattnanont, 1990	*

Pest	Occurrence in Philippines	Reference	Occurrence in Australia	Reference	Associated with fruit	Reference	Consider pest
<i>Thosea sinensis</i> (Lepidoptera: Limacodidae) (saddleback)	Yes	Waterhouse, 1993	No	CABI 2000	*	Dammerman 1929; Kalshoven and van der Laan 1981	*
<i>Thrips florum</i> (Thysanoptera: Thripidae) (scab thrips)	Yes	Palmer and Wetton, 1987	Yes	Swaine 1975	Yes	Swaine 1975	*
4 unidentified species (Lepidoptera: Psychidae) (bagworms)	Yes	BPI, 2000	No	Nielsen <i>et al.</i> 1996	*	Kalshoven and van der Laan 1981	*
BACTERIA							
<i>Erwinia carotovora</i> (corm rot)	Yes	Halos <i>et al.</i> , 1980	Yes	Pegg <i>et al.</i> 1974	*	Jones 1999	*
<i>Ralstonia solanacearum</i> (Syn. <i>Pseudomonas solanacearum</i>) (Moko)	Yes	Jones, 1999	No	Jones 1999	Yes	Jones 1999	Yes
FUNGI							
<i>Cercospora hayi</i> (brown spot, diamond spot)	Yes	BPI, 2000	No	Jones 1999	Yes	Jones 1999	Yes
<i>Colletotrichum musae</i> (anthracnose)	Yes	BPI, 2000	Yes	Hayden <i>et al.</i> 1994	Yes	Jones 1999	No
<i>Cordana musae</i> (Cordana leaf spot)	Yes	BPI, 2000	Yes	Jones 1999	No (with trash)	Jones 1999	*
<i>Deightoniella torulosa</i> (speckle)	Yes	BPI, 2000	Yes	R. Allen, pers. comm	Yes	Jones, 1999	*

Pest	Occurrence in Philippines	Reference	Occurrence in Australia	Reference	Associated with fruit	Reference	Consider pest
<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> (Fusarium wilt, Panama)	Yes	Jones, 1999	Yes (restricted and under official control?)	Simmonds, 1966; Pitkethley, 1998	*	Jones, 1999	*
<i>Mycosphaerella fijiensis</i> (black leaf streak)	Yes	Jones, 1999	Yes (restricted and under official control)	Jones, 1999	No (with trash)	Jones, 1999	Yes
<i>Mycosphaerella musicola</i> (Sigatoka)	Yes	Jones, 1999	Yes	Jones, 1999	No (with trash)	Jones, 1999	*
<i>Pyricularia grisea</i> (Pitmark)	Yes	BPI, 2000, Jones, 1999	Yes	Jones, 1999	Yes	Jones, 1999	*
Several fungi (crown rot)	Yes	BPI, 2000	*	*	*	BPI, 2000	
NEMATODES							
<i>Meloidogyne arenaria</i> (root knot nematode)	Yes	Taylor <i>et al.</i> , 1982	Yes	Taylor <i>et al.</i> , 1982	No	Triantaphyllou and Hirschmann, 1960	No
<i>Meloidogyne incognita</i> (root knot nematode)	Yes	Timm, 1965	Yes	Simmonds, 1966	No	Ibrahim and El-Saedy, 1987	No
<i>Rodopholus similis</i> (root knot nematode)	Yes	Booth and Stover 1974	Yes	Persley, 1993; Pitkethley, 1998; Simmonds, 1966	No	Boncatto and Davide 1980	No

Pest	Occurrence in Philippines	Reference	Occurrence in Australia	Reference	Associated with fruit	Reference	Consider pest
VIRUSES							
Abaca mosaic <i>potyvirus</i> (abaca mosaic, sugarcane mosaic)	Yes	Jones, 1999	No	Jones, 1999	*	Jones, 1999	*
Banana bract mosaic <i>potyvirus</i> (banana bract mosaic)	Yes	Jones, 1999	No	Jones, 1999	*	Jones, 1999	*
Banana bunchy top <i>nanavirus</i> (banana bunchy top)	Yes	Jones, 1999	Yes (under official control)	Jones, 1999	*	Jones, 1999	*
Banana streak <i>badnavirus</i> (banana streak)	Yes	Jones, 1999	Yes	Jones, 1999	*	Jones, 1999	*
WEEDS							
<i>Centrosema pubescens</i> (centro)	Yes	Serra <i>et al.</i> , 1996	Yes	Mannetje and Pritchard, 1974	*	Mannetje and Pritchard, 1974	*
<i>Cleome ruidosperma</i> (consumption weed)	Yes	Madrid and Manimtim, 1978	No	CABI 2000	*	Madrid and Manimtim, 1978	*
<i>Commelina diffusa</i> (water grass)	Yes	Waterhouse, 1993	Yes	Ciba Geigy, 1982	*	Waterhouse, 1993	*
<i>Cyperus rotundus</i> (nut grass)	Yes	Waterhouse, 1993	Yes	Parsons and Cuthbertson, 1992	*	Holm <i>et al.</i> , 1977	*
<i>Cyrtococcum patens</i>	Yes	BPI, 2000	No	Chapman, 1991	*	Kuo, 1994	*

Pest	Occurrence in Philippines	Reference	Occurrence in Australia	Reference	Associated with fruit	Reference	Consider pest
<i>Echinochloa colona</i> (jungle rice)	Yes	Moody, 1986	Yes	Groves, 1991	*	Holm <i>et al.</i> , 1977	*
<i>Euphorbia hirta</i> (garden spurge)	Yes	Waterhouse, 1993	Yes	Holm <i>et al.</i> , 1979	*	Sauerborn <i>et al.</i> , 1988	*
<i>Mimosa pudica</i> (mimosa)	Yes	Waterhouse, 1993	Yes	Parsons and Cuthbertson, 1992	*	Holm <i>et al.</i> , 1977	*
<i>Peperomia pellucida</i>	Yes	BPI, 2000	Yes	Forster, 1993	*	van Jaarsveld, 1992	*
<i>Synedrella nodiflora</i> (synedrella)	Yes	Holm <i>et al.</i> , 1997	Yes	Holm <i>et al.</i> , 1997	*	Oladokun, 1977a, 1977b, 1978	*

*Maybe

APPENDIX 3: QUARANTINE PESTS

Table 6 Quarantine pests

The RAP will complete and expand this list, which is included here for illustration purpose only

Scientific name	Common name(s)	Establishment and spread feasible?	Reference	Consequences significant?	Reference	Quarantine pest status
Pathogens						
<i>Mycosphaerella fijiensis</i> Morelet	black Sigatoka	Yes	*	Yes	*	
<i>Ralstonia solanacearum</i> (Yabuuchi <i>et al.</i> , 1995)	Moko	Yes	*	Yes	*	
Arthropods						
<i>Dysmicoccus neobrevipes</i> Beardsley	grey pineapple mealybug	Yes	*	Yes	*	
<i>Philicoptus demissus</i> (Heller)	peel-scarring weevil	Yes	*	Yes	*	

*To be inserted

APPENDIX 4: CURRICULA VITAE FOR RAP AND TWG MEMBERS

DR SHARAN SINGH

ACADEMIC QUALIFICATIONS:

BSc Agriculture (Honours in Plant Protection), Punjab Agricultural University, Ludhiana, India.

MSc Plant Pathology, Punjab Agricultural University, Ludhiana, India.

PhD Forestry (Pathology), Australian National University, Canberra, Australia.

Graduate Certificate in Management Studies, Canberra University, Canberra, Australia.

PREVIOUS POSITIONS:

1979 -1980 Agricultural Representative, Bayer (India) Limited, Punjab, India.

1984 - 1987 Post-doctoral Fellow, University of Sydney, Plant Breeding Institute, Castle Hill.

1987 - 1990 Quarantine Plant Pathologist, Queensland Department of Primary Industries, Indooroopilly.

1990 - 1992 Scientific Administrator, AQIS, Canberra.

1992 - 2000 Principal Scientist/Manager, AQIS, Canberra; and also Acting Head, Pest and Disease Information Section, Plant Quarantine Policy Branch for six months in 1994.

2000 - present Acting Senior Manager, AQIS/Biosecurity Australia, AFFA, Canberra.

WORK EXPERIENCE:

- Managed and contributed to pest risk analyses and/or developed importation policy for many plants and plant products, including fresh fruit (e.g. Spanish citrus, Florida citrus and Ecuadorian bananas), nursery stock (e.g. banana, olive and strawberry plants), and agricultural seeds (e.g. lucerne, peanut, sweetcorn and tomato). Member of the Disease Risk Analysis Technical Working Group for the non-routine import risk analysis of bulk maize grain from the USA.
- Conducted post entry quarantine inspections and testing in Queensland for a range of imported agricultural seeds and nursery stock, including bananas and heliconias, and crop surveys for quarantine pests, including diseases of bananas in

northern Queensland (Cape Yorke) and the Torres Strait islands.

- Participated in the management of exotic pest and disease incursions, including citrus canker in Lambell's Lagoon (Northern Territory), the Moko bacterium on heliconias in the Cairns area (Queensland), anther smut of carnations in Brisbane (Queensland), and pawpaw ringspot potyvirus in south east Queensland.
- Evaluated numerous applications for the importation of plant pathogens for research purposes and release as biological control agents.
- Carried out research on genetics and breeding for wheat rust resistance in triticales (wheat and rye hybrids), disease resistance and chemical control of rust of peas and epidemiology of rust of poplars.
- Managed and contributed to many market access proposals for exports of Australian plants and plant products, including citrus to Thailand and China, malting barley, sorghum, sunflower and cottonseed to Mexico, oats to the USA, wheat and carpet grass to Brazil, rice straw to Japan, and wheat and barley to China.
- Managed and participated in bilateral plant quarantine discussions with many countries, including China, India, Israel, the European Union, South Africa, New Zealand, the USA, Canada, Mexico, Argentina, Brazil and Chile.
- Currently managing import risk analyses, market access (exports) and relevant international phytosanitary standards and agreements.

DR ROB ALLEN

ACADEMIC QUALIFICATIONS:

BscAgric., University of Sydney, majoring in plant pathology.

MscAgric., University of Sydney, with thesis on diseases of vetch.

PhD, University of Auckland, New Zealand, with thesis on *Phytophthora cinnamomi*.

PREVIOUS POSITIONS:

- | | |
|--------------|---|
| 1963-1992 | Plant Pathologist, New South Wales Department of Agriculture, based mainly at Wollongbar. |
| 1992 - 1997 | Chief Plant Pathologist, Queensland Department of Primary Industries, based at Indooroopilly. |
| 1997-present | Principal Policy Officer (Plant Health), Queensland Department of Primary Industries, based at Head Office, Brisbane. |

WORK EXPERIENCE:

- Undertook research, development and extension activities to improve disease management for a wide range of crops in the far north coast of New South Wales, including vegetables, bananas, avocados, maize and field crops.
- Undertook specialist research on quantitative epidemiology on a range of plant diseases and insect pests, including banana bunchy top, avocado sunblotch and banana leaf diseases.
- Developed plant health schemes such as the Avocado Nursery Voluntary Accreditation Scheme (ANVAS) and Guidelines for Banana Planting.
- Administered plant protection staff technical activities within a regionalised management matrix, from a local (Indooroopilly) and statewide perspective.
- Queensland member of Plant Health Committee since 1994 (currently Chair), and ex-officio member of various Consultative Committees on Exotic Plant Pests and Diseases.
- Chairman of the Banana Industry Protection Board (since 1995), administering the Banana Industry Fund and providing technical and policy oversight of banana plant health regulation and research in Queensland.

DR BRYAN CANTRELL

ACADEMIC QUALIFICATIONS:

BSc, University of Queensland, majoring in entomology and parasitology.

BSc (Hons), University of Queensland, specialising in entomology.

PhD, University of Queensland, for a thesis on the classification, morphology and biology of the Australian Tachinidae (Diptera – parasitic flies).

PREVIOUS POSITIONS:

1983 – 1989	Senior Entomologist, Queensland Department of Primary Industries (QDPI), based at Indooroopilly.
1990-1995	Manager, QDPI Entomology Branch and Chief, Plant Protection Systems, Division of Plant Protection; both positions based at Indooroopilly.
1996-present	Principal Policy Officer, Plant Health, QDPI Animal and Plant Health Service, based at Head Office, Brisbane.

WORK EXPERIENCE:

- Curator of the QDPI Insect Collection, with responsibility for diagnosis of agriculturally-important insects including insects of quarantine significance; certification of country freedom from nominated pests; and specialist research on diagnosis of insect pests.
- Comprehensive knowledge of Queensland's primary industry production systems and factors affecting management and control of agricultural insect pests through collaboration with field entomologists developing Integrated Pest Management programs for major horticultural crops e.g. bananas, citrus and tropical fruit crops.
- Administered entomology staff technical and research activities within a regionalised management matrix, from a local (Indooroopilly) and statewide perspective.
- Secretary of Plant Health Committee (1993 - 1995) and ex-officio member of various Consultative Committees on Exotic Plant Pests and Diseases.
- Member of the strategic management group for the successful papaya fruit fly eradication campaign in north Queensland, 1995 – 1999.
- Current responsibilities include policy development and provision of substantive technical advice on issues involving:
 - quarantine pest management and import risk assessment;
 - use of agricultural and veterinary chemicals in Queensland; and
 - beekeeping.

MR BOB PATON

ACADEMIC QUALIFICATIONS:

Bsc, Australian National University, Canberra, majoring in botany and zoology.

PREVIOUS POSITIONS:

- 1963-1972 Senior Technical Officer Department of Forestry Australian National University.
- 1972-1976 Forest Entomologist, CSIRO, Division of Forestry.
- 1976-1982 Quarantine Entomologist, Plant Quarantine, Department of Health, Canberra.
- 1982-1984 Officer in Charge, Plant Quarantine Station, Weston, Department of Primary Industries.
- 1984-1987 Senior Entomologist, Plant Quarantine Branch, AQIS, Canberra.
- 1987-1994 Head, Pest Disease Information Section, Plant Quarantine Branch, AQIS, Canberra.
- 1994-1997 Consultant, Quarantine and Plant Protection Systems.
- 1997-Present Policy Officer (Market Access) NSW Agriculture, Orange, NSW

WORK EXPERIENCE:

- Twenty-five years experience in entomology with an extensive background in quarantine related pests of plants and plant produce.
- Involved in quarantine surveys in northern Australia for pests incursions with particular focus on tropical crops
- Managed the implementation of post entry quarantine operations at the Weston Quarantine Station for a range of imported plants.
- Responsible for the development of conditions and import approvals for biological control agents.
- Extensive experience and knowledge of quarantine operations and treatments.
- Involved in a large number of Import Risk Analysis and the development of a range of import and export protocols over a twenty year period, including the proposal to import bananas from Ecuador.
- Development and implementation of quality assurance systems to meet international and interstate phytosanitary restrictions.

MR DAVID PEASLEY

ACADEMIC QUALIFICATIONS:

Wagga Diploma in Agriculture 1970.

PROFESSIONAL AFFILIATIONS

- Member of the Australian Institute of Agricultural Science and Technology (AIAST).
- Certified Practising Agriculturist (CPAg).
- Member of the Australian Association of Agricultural Consultants (AAAC).

PREVIOUS POSITIONS:

1976-92. District Horticulturist (Tropical Fruit) with NSW Agriculture, North Coast Region.

Specialising in field investigations and extension on a range of subtropical horticultural trees crops including bananas, avocados, passionfruit, coffee and mangoes.

1992-95. Program Leader (Tropical Fruit) with NSW Agriculture.

Leading the research, development and extension program on the North Coast Region - based at Alstonville Tropical Fruit Research Station.

Member of the Board of NSW Banana Industry Committee.

1996 to present. Principal, Peasley Horticultural Services.

Member, Australian Avocado Growers Federation R&D Committee.

Member, Australian Passionfruit Industry Association R&D Committee.

WORK EXPERIENCE:

Thirty years experience in a range of horticultural fruit industries in New South Wales, twenty years as a District Horticulturist then as Program Leader with NSW Agriculture, leading the Tropical Fruit research, development, and extension program and the last five years as a Private Consultant to the sub-tropical fruit industries of Eastern Australia.

- Major work areas included:
 - assessing new horticultural crops and cultivars for the NSW North Coast.
 - developing management programs to improve the economic and environmental sustainability of production.
 - evaluating new control treatments for pest and diseases.
 - working cooperatively with industry associations in research and development, strategic planning and project management.
 - maintaining strong communication with the public, government and industry groups
 - providing advice to local and state governments, the Environment Protection Authority and the National Registration Authority on horticultural matters concerning land use and management practices.

- Major projects:
 - Chairman, National Banana Plant Health Improvement Project, 1993-98.
 - Project Chief Investigator for R&D Projects on passionfruit, coffee and bananas.

CURRENT ACTIVITIES

- During 2000 jointly prepared an “Integrated Production and Marketing Plan for NSW Bananas” commissioned by the NSW Banana Industry Committee.

- During 2001 may be involved in the establishment of productivity groups for banana growers, subject to the outcome of an application by the NSW Banana Industry Committee for State and Federal funding.

MR MIKE ROBBINS

ACADEMIC QUALIFICATIONS:

Certificate of Agriculture, Western Australia Department of Agriculture.

PREVIOUS POSITIONS:

1969 – 1973	Administration Officer, Agriculture Department, Western Australia, Fremantle Stock Office and District Office.
1973 – 1975	Plant Quarantine Inspector, AQIS Western Australia.
1975 – 1985	Cereal Inspector, AQIS Western Australia.
1985 – 1998	Manager, Technical Services, AQIS Western Australia.
1998 – present	Manager, Grain, Seed and Nursery Stock, AQIS, Canberra.

WORK EXPERIENCE:

- From 1969 to 1998 administered, managed or performed inspection tasks in quarantine and export disciplines such as live animal exports, plant quarantine, animal quarantine, grain inspection, and auditing.
- Managed eradication campaigns in Western Australia – Potato Cyst Nematode (PCN) from 1986 to 1998, and Apple Scab from 1990 to 1998. Developed Apple Scab Eradication Manual and assisted in the development of a national plan for the control and eradication of PCN.
- Served as Australian Horticultural Officer in South East Asia based in Singapore for ten months in 1998/99. Duties included assessment of the outturn condition of Australian horticultural produce in South East Asian markets, and comparative assessment against produce from major competitors.
- Managed the operation of Western Australian Interstate Quarantine Checkpoints located at Kununurra, Eucla and Perth Domestic Airport from 1995 to 1998.
- Developed Quality Assurance systems for the movement of fresh fruits and vegetables and seeds into Western Australia from other Australian States.
- Developed procedures for the testing, analysis and audit of Annual Ryegrass Toxicity in export hay in 1995.
- Participated in the Import Risk Analysis of bulk maize grain from the USA as a member of the Operations Technical Working Group.

DR CHRIS HAYWARD

ACADEMIC QUALIFICATIONS:

BSc (Hons) University of Birmingham, England, 1953. Bacteriology major.

PhD University of Birmingham, 1956. Thesis topic: Diversity of Oral, Lactobacilli.

Member Australian Society for Microbiology, Inc. 1976.

PREVIOUS POSITIONS:

July 1953-July 1956	Medical Research Council Studentship.
Aug 1956 - Dec 1958	Process Microbiologist. Microbiological Research Institute, Port of Spain, Trinidad, WI.
Jan 1959-Mar 1965	Bacteriologist at the Commonwealth Mycological Institute (now the CAB International Mycological Institute) Kew, England.
Mar 1965-Dec 1968	Lecturer in Microbiology, University of Queensland, Australia. Promoted to Senior Lecturer 1968.
Dec 1968-Dec 1978	Senior Lecturer in Microbiology, University of Queensland, Australia.
Dec 1978-July 1997	Associate Professor in Microbiology, University of Queensland, Australia.
April 1993-Dec 1994	Acting Head of Dept., Microbiology, University of Queensland, Australia.
1993-1997	Education Program Manager, University of Queensland, Cooperative Research Centre for Tropical Plant Pathology.

WORK EXPERIENCE:

- During study leaves in Hawaii (1971-72), Indonesia (1985), the International Potato Centre, Peru (1989), AVRDC (Taiwan, 1992), Brasil and South Africa (1996), and several field trips to Mauritius, Madagascar, Reunion, the Philippines, Malaysia and P.R. China I worked on bacterial diseases of numerous plants, including sugar cane and ornamentals and in particular the many wilts of horticultural crops caused by *Ralstonia solanacearum*.
- In 1996, and again in 1998 made visits to Mindanao, Southern Philippines, to evaluate control measures for Moko and Bugtok diseases of dessert and cooking bananas.
- Published many papers, reviews and book chapters on bacterial diseases of plants.
- Served as Associate Editor for the journals *Phytopathology*, *Australasian Plant*

Pathology and the Journal of Applied Bacteriology.

- Elected Fellow of the American Phytopathological Society in July, 1997.
- Since retirement, continued interest in bacterial diseases of plants, written several reviews and book chapters and carried out short term consultancies for AQIS and the Victorian Potato Crisping Research Group.

MR RON PETERSON

ACADEMIC QUALIFICATIONS:

QDDM (1962)	Queensland Agricultural College, Lawes.
BScAgr (1966)	University of Queensland, major in bacteriology.
MScAgr (1976)	University of Queensland. Thesis title – Inoculum Source for Anthracnose Fungi.

PREVIOUS POSITIONS:

1968– 1975	Plant pathologist, QDPI:- Brisbane and Nambour.
1975– 1989	Senior Plant Pathologist QDPI:- Nambour and Mareeba.
1989 – present	Principal Plant Pathologist, QDPI Mareeba.
1989 – 1992	Regional Manager (North) Plant Pathology branch.
1989-1992	Member Horticultural and Field Crop Management Groups.
1990 – 1992	Coordinator, Horticultural Management Group.
1995 – 1996 (6 months)	A/g Manager Horticulture (North).

WORK EXPERIENCE:

- Thirty three years with diseases of horticultural crops, 20 years with diseases of banana and more than 15 years with the 2 Sigatoka diseases. Work has been with epidemiology, etiology and control aspects of mainly fungal diseases.
- Comprehensive understanding of a wide range of agricultural crops in particular horticultural crops from working for over 30 years in rural areas of Queensland.
- Extensive research, development and extension experience with disease management programs for a range of diseases on a number of crops including vegetables (beans, tomatoes, cucurbits and ginger) fruit (bananas, avocado, mango, papaw, passionfruit, macadamia) and peanuts.
- The extensive experience with the yellow Sigatoka disease of banana includes control programs (chemical, cultural and integrated management programs) and fungal resistance to fungicides (development of techniques to detect shifts in sensitivity, monitoring programs).
- Experience with black Sigatoka includes disease identification, screening cultivars for resistance to black Sigatoka (4 locations, Tonga, Western Samoa, Cook Islands and PNG over about 7 years including international programs – ACIAR, INIBAP, IMTP), disease eradication programs (6 outbreaks), development of contingency plans over about 8 years.
- Member of the National Black Sigatoka Working Group and the National Black Sigatoka Consultative Committee for the Black Sigatoka Eradication Programs

since 1982. Involved in 6 eradication programs, field coordinator of the eradication programs at Bloomfield, Weipa and Daintree. Undertook black Sigatoka surveys in the Torres Strait and Cape York areas over a number of years.

- Conducted post entry quarantine inspections in quarantine glasshouse in Cairns, field plots at Southedge Research Station, and orchids in private glasshouses. Experience in other quarantine issues includes participation in surveys for and eradication of Moko disease of banana and canker of citrus. Organised and participated in extensive local surveys following the identification downy mildew and boil smut of maize, black spot and ring spot of papaw, Cercospora blotch and sunblotch of avocado and ergot of sorghum.
- Administrative experience from 30 years managing country plant pathology laboratories, 3 years as the Regional Manager, Plant Pathology Branch and a member of a range of management groups.

CURRENT PROJECTS:

- Plant Pathology Services (diagnostics, supervision, mentoring, and ad hoc plant pathology).
- Management of Banana Leaf Diseases in NQ.
- Black Sigatoka. APH&S project.
- Attend Black Sigatoka Seminar in Costa Rica and visit banana areas in Central America.

Project tentative at this stage as funds and travel approval has not been received.

- Banana Fungicide Resistance.

DR JOHN THOMAS

ACADEMIC QUALIFICATIONS:

BScAgr, University of Sydney, majoring in plant pathology.

PhD, University of Sydney, with thesis entitled "Tobacco yellow dwarf and bean summer death viruses".

PREVIOUS POSITIONS:

1975-1979	Postgraduate study at the University of Sydney.
1979-1986	Plant Virologist, Queensland Department of Primary Industries.
1986-1991	Senior Plant Virologist, Queensland Department of Primary Industries.
1991-present	Principal Plant Virologist, Queensland Department of Primary Industries.
1997-present	Adjunct Senior Lecturer, University of Queensland.

WORK EXPERIENCE:

- Development, conduct and management of research projects covering a wide range of crops and plant virus diseases in Queensland. Major areas have included the identification and control of viruses of tomato, epidemiology of potato leafroll virus, development of diagnostic assays for lettuce mosaic virus, characterisation, diagnostic assays and control of viruses of banana, both in Australia and overseas.
- Provision of diagnostic and virus indexing services, for local industry, State Departments and AQIS. This has especially applied to bananas and covers the indexing of all banana for commercial tissue culture propagation in Australia, all bananas imported through Australian post entry quarantine, and indexing of the international germplasm collection of the International Network for the Improvement of Banana and Plantain (INIBAP).
- Provision of policy counsel within the area of plant virology to DPI and specialist advice to external clients, especially AQIS.
- Member of the Executive Committee and Diagnostics Committee for the Co-operative Research Centre for Tropical Plant Protection (CRCTPP).
- Adjunct Senior Lecturer at the University of Queensland, in the area of Plant Virology.

CURRENT PROJECTS:

- "Diagnosis of banana pathogens" - Virology activities are focussed on the variation of Banana streak virus and its integration into the banana genome.

- "Pineapple viruses and mealybug wilt disease".
- "Identification and epidemiology of tospoviruses in tomato and capsicum".
- "Quarantine pathogens". Covers, in part, diagnosis of viruses relevant to the Northern Australia Quarantine Strategy, including viruses of banana.
- "Development of a diagnostic assay for banana dieback virus". Study of virus of international germplasm and quarantine significance.

MR BRUNO PINESE

ACADEMIC QUALIFICATIONS:

BScAgr (Entomology)

PREVIOUS POSITIONS:

1974 to present Entomologist and Senior Entomologist, QDPI.

WORK EXPERIENCE:

- 1974-1977 Entomologist, Queensland Department of Primary Industries, Stanthorpe. Conducted research into pest control in grape vines and the biology of Scolitid beetles in stone fruit.
- 1977-2000 Led research into insect control methods for the banana industry in Queensland. Specifically, developed improved techniques for pesticide application, biology and economic thresholds of mites and banana weevil borer. Developed and introduced the technique of bell injection for control of banana scab moth. This reduced pesticide use by over 90% and is now universally adopted. Economic thresholds are being implemented and have resulted in reduced pesticide applications.
- 1994 Senior author of the book on applied pest control "Bananas - insect and mite management" which provides detailed information on biology, monitoring methods and control options for the major and minor pests of Australian bananas including a section on quarantine issues.
- 1995-1996 Involved with the research into the host status of Cavendish bananas to papaya fruit fly. Results were used to obtain acceptance of the "hard green" protocol which allowed market access without the need for post harvest chemical disinfestation.
- 2001 Invited to co-author a book chapter on banana pests, specifically in relation to Australia and the Pacific region. Ongoing advisory and supervisory role in banana pest research. Current research involvement is concentrating on developing IPM for avocado and sweet potato pests in Queensland. Also leading contract research and development into new pesticides for control of fruit fly and weevils and investigating ants and their role in damaging irrigation systems in banana plantations. The importation and evaluation of a parasite for control of spiralling whitefly.

DR GORDON GUYMER

ACADEMIC QUALIFICATIONS:

BSc, University of New England, majoring in botany and ecology.

BSc (Hons), University of New England, specialising in plant taxonomy and ecology.

PhD, University of New England, for a thesis on the classification, morphology, taxonomy, ecology and biology of the genus *Brachychiton* (Sterculiaceae – kurrajongs and bottle trees).

PREVIOUS POSITIONS:

1981 – 1990	Senior Principal Botanist, Queensland Department of Primary Industries (QDPI), based at Indooroopilly.
1991-1998	Chief Botanist, Queensland Herbarium, Department of Environment and Heritage.
1999-present	Manager, Biodiversity Assessment and Services, Queensland Environmental Protection Agency, based at The Queensland Herbarium, Brisbane Botanic Gardens, Toowong.

WORK EXPERIENCE:

- Manager of the Queensland Herbarium, the State's plant biodiversity centre with responsibility for vegetation survey and mapping, plant taxonomy, plant biodiversity services (including quarantine, forensic), specialist research on plants species (threatened, weeds), plant communities and ecological processes.
- Comprehensive knowledge of Queensland's plant biodiversity and factors affecting management and maintenance of environmental values.
- Extensive management of plant biodiversity professional and technical staff and their research activities within Queensland.
- Member of the state and national biodiversity committees: Flora of Australia Editorial Committee, Australian Biological Resources Study Advisory Committee, Council of Heads of Australian Herbaria, ANZECC Endangered Flora Network, Vegetation Management Advisory Committee, Scientific Advisory Committee (Protected Plants in Trade, Nature Conservation Act).
- Current responsibilities include policy development and provision of technical advice on issues involving:
 - vegetation management, monitoring and assessment;
 - nature conservation and
 - threatening processes