TECHNICAL ISSUES PAPER

Import Risk Analysis (IRA)
for the importation of Tahitian Limes
from New Caledonia

August 2002

AGRICULTURE, FISHERIES AND FORESTRY - AUSTRALIA

Foreword

Contents

GLOSSARY OF TERMS AND ABBREVIATIONS

AFFA	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
Biosecurity Australia	a major operating group within the Commonwealth Department of Agriculture, Fisheries and Forestry - Australia. Biosecurity Australia protects consumers and animal and plant health, and facilitates trade, by providing sound scientifically based and cost effective quarantine policy
Control (of a pest)	suppression, containment or eradication of a pest population
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
Hitch-hiker	an arthropod that is carried by a commodity and, in the case of plant and plant products, does not infest those plant or plant products.
ICA	Interstate Certification Assurance
ICON	AQIS Import Conditions database
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

National Plant Protection Organisation — official service established by a government to discharge the functions specified by the IPPC

Non-quarantine pest — pest that is not a quarantine pest for an area

Official — established, authorised or performed by a National Plant Protection Organisation

Official control (of a regulated pest) — 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

PBPM — Plant Biosecurity Policy Memorandum

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 assessment — determination of whether a pest is a quarantine pest and evaluation of its introduction potential

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 — the decision-making process of reducing the risk of introduction of a quarantine pest

Pest risk management (for quarantine pests) — evaluation and selection of options to reduce the risk of introduction and spread of a 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

PRA	pest risk analysis
PRA area	area in relation to which a pest risk analysis is conducted
QP	Quarantine Proclamation
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 non-quarantine pest	a non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party
SCU	Specific Commodity Understanding
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	World Trade Organization 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 the importation of fresh Tahitian limes from New Caledonia. The Import Risk Analysis (IRA) has been initiated according to *The AQIS Import Risk Analysis Process Handbook* (the Handbook) (AQIS, 1998). The changes foreshadowed in the draft of the new handbook will be adopted where appropriate.

This Technical Issues Paper contains the following sections:

- Biosecurity Australia's framework for quarantine policy and for IRA and the international framework for trade in animal- and plant-derived products
- Pest Risk Analysis (PRA) methodology
- Background to this IRA
- Current quarantine policy for the importation of fresh limes
- Results of pest categorisation
- An outline of further steps in the IRA process.

The introductory sections provide information that is fundamental to understanding the national and international framework under which import applications from other countries are considered. Information specific to the citrus industry is covered in the final section entitled "The Importation of Tahitian Limes from New Caledonia".

This *Technical Issues Paper* precedes publication of a draft and subsequently a final IRA document. The draft IRA document will contain the risk assessment and risk management methods and results. It will also provide a preliminary position on the importation of fresh Tahitian limes from New Caledonia. The final IRA will include the same elements with any necessary revisions, and also a description of quarantine conditions for fresh Tahitian limes from New Caledonia.

Biosecurity Australia will consult with stakeholders and relevant experts as necessary during the next stage of the IRA process, while the draft IRA paper is being prepared.

To date, Biosecurity Australia has identified a total of 74 pests and one hitch-hiker associated with Tahitian limes in New Caledonia. These pests include arthropods, algae, fungi, and viruses. Of these 74 pests and one hitch-hiker, 30 are present in Australia and do not need to be considered further in the IRA. Of the remaining pests which are not present in Australia (or present but under official control, or area freedom exists), 22 are found on the import pathway (fruit). These pests will need to be considered further in the IRA. The next stage will involve determining the potential of these pests to establish and spread in Australia and the economic consequences of their entry. This part of the risk assessment will be covered in the draft IRA paper. The draft IRA paper will also consider risk management measures to achieve Australia's appropriate level of protection (ALOP).

The draft IRA paper will cover technical issues related to pest risk assessment and pest risk management, and will indicate a preliminary view on which risk management measures will achieve Australia's ALOP. Stakeholders are strongly encouraged to contribute to the IRA by providing relevant technical information and raising issues as early as possible, preferably while commenting on the *Technical Issues Paper* or during meetings with Biosecurity Australia.

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

Biosecurity Australia will submit its recommendations to the Director of Animal and Plant Quarantine (the Director) for consideration. The Director will consider the recommendations and make the final determination. The Director's determination and the final IRA paper 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. If the appeal is upheld, Biosecurity Australia will rectify the deficiency. If the appeal is rejected, the policy will be adopted.

AUSTRALIA'S BIOSECURITY POLICY

Legislative framework

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

The *Quarantine Act* and its subordinate legislation, including *Quarantine Proclamation 1998* (QP 1998), are the legislative basis of human, animal and plant biosecurity in Australia. The *Quarantine Amendment Act 1999*, which commenced in June/July 2000, incorporates major changes to the *Quarantine Act* as recommended in the report of the Australian Quarantine Review Committee (AQRC, 1996).

Section 4 of the *Quarantine Act* defines the scope of quarantine as follows:

In this Act, quarantine includes, but is not limited to, measures:

- *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 or things*

- *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*

Quarantine Risk

The concept of level of quarantine (or biosecurity) risk has been introduced as the basis of quarantine decision-making. When making decisions under the *Quarantine Act*, decision-makers must consider the level of quarantine risk and must take prescribed actions to manage the risk if it is unacceptably high. Section 5D of the *Quarantine Act* includes harm to the environment as a component of the level of quarantine risk:

Section 5D: level of quarantine risk

A reference in this Act to a level of quarantine risk is a reference to:

(a) the probability of:

(i) a disease or pest being introduced, established or spread in Australia or the Cocos Islands; and

(ii) 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.

Quarantine Proclamation

Subsection 13(1) of the *Quarantine Act* provides, that the Governor-General in Executive 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 people, animals or plants. The Governor-General may apply this power of prohibition generally or subject to any specified conditions or restrictions.

QP 1998 is the principal legal instrument used to control the importation into Australia of goods of quarantine (or biosecurity) interest. A wide range of goods is specified in the *QP 1998* including animals, plants, animal and plant products, micro-organisms, and certain other goods which carry a high risk if uncontrolled importation is allowed - e.g. soil, water, vaccines, feeds.

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 import risk analysis provides the scientific and technical basis for biosecurity policies that determine 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 follows:

70 Things a Director of Quarantine must take into account when deciding whether to grant a permit for importation into Australia

(1) In deciding whether to grant a permit to import a thing into Australia or the Cocos Islands, or for the removal of a thing from the Protected Zone or the Torres Strait Special Quarantine Zone to the rest of Australia, a Director of Quarantine:

(a) must consider the level of quarantine risk if the permit were granted; and

(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.

The matters include the level of quarantine risk (see above), whether the imposition of conditions would be necessary to limit the quarantine risk to a level that would be acceptably low, and anything else known to the decision maker to be relevant.

Environment

While protection of the natural and built environment has always been an objective of Australian quarantine policy and practice, recent amendments to the *Quarantine Act 1908* make explicit the responsibility of quarantine officers to consider impact on the environment when making decisions. In particular, the scope of quarantine (as described in Section 4 of the *Quarantine Act*),

and the level of quarantine risk (as described in Section 5D of the *Quarantine Act*), include explicit reference to the environment.

Environment is defined in Section 5 of the *Quarantine Act* as:

> *… all aspects of the surroundings of human beings, whether natural surroundings or surroundings created by human beings themselves, and whether affecting them as individuals or in social groupings.*

When undertaking an import risk analysis, Biosecurity Australia fully takes into account the risk of harm to the environment to ensure that the biosecurity policies developed reflect the Australian Government's approach to risk management. This is achieved through the involvement of Environment Australia in decisions on the import risk analysis work program and, for particular import risk analyses, discussions on the scope, the likely risks, and the expertise which may be required to address those risks. Environment Australia may identify additional technical issues that it believes should be considered during an import risk analysis, and may nominate officers with relevant expertise who would be available to participate in the import risk analysis.

Policy framework

The primary purpose of biosecurity is to protect Australia from the entry, establishment and spread of unwanted pests and diseases that may cause social, economic or environmental damage, while minimising the restrictions on the entry of agricultural commodities.

Due to Australia's unique and diverse flora and fauna and the value of its agricultural industries, successive Australian Governments have maintained a highly conservative but not a zero-risk approach to the management of biosecurity risks. This approach is evident in the strictness of all biosecurity-related activities, including policies on imported commodities, procedures at the border and operations against incursions of pests and diseases.

Recent inquiries into Australia's biosecurity regime have recognised that it is impossible in practice to operate a zero-risk biosecurity regime. In 1979, the Senate Standing Committee on Natural Resources stressed that there is no such thing as a zero-risk quarantine policy, and it believed that Australia's approach should be better described as '*scientific evaluation of acceptable risk'*. In 1988, the Lindsay Review of Australian quarantine concluded that *' a no risk policy is untenable and undesirable and should be formally rejected*'. In 1996, the Senate Rural and Regional Affairs and Transport Committee was of the view that a zero-risk approach was unrealistic and untenable, and that its currency only demonstrated that the concepts of risk assessment and risk management were widely misunderstood. These themes were repeated in the AQRC report. In its 1997 response to that report, the Government confirmed a managed risk approach.

Import risk analysis provides the basis for considering import applications for the importation of animals and animal-derived products, and plants and plant-derived products. In keeping with the scope of the *Quarantine Act* and Australia's international obligations, only factors relevant to the evaluation of quarantine risk (i.e. the risk associated with the entry, establishment and spread of unwanted pests and diseases) are considered in the import risk analysis. The potential competitive economic impact of prospective imports is not within the scope of the import risk analysis process, and any discussion on industry support mechanisms would need to remain quite separate from the import risk analysis.

WTO and import risk analysis

One of the principal objectives in developing the administrative framework for import risk analysis was to ensure that it complied with Australia's international rights and obligations.

These derive principally from the *SPS Agreement*, although other WTO Agreements (including the *Agreement on Technical Barriers to Trade* – the TBT Agreement) may be relevant in certain circumstances. Specific international guidelines on risk analysis developed under IPPC and by OIE are also relevant.

The *SPS Agreement* applies to measures designed to protect human, animal and plant life and health from pests and diseases, or a country from pests, and which may directly or indirectly affect international trade. It also recognises the right of WTO Member countries to determine the level of protection they deem appropriate and to take the necessary measures to achieve that protection. Sanitary (human and animal health) and phytosanitary (plant health) measures apply to trade in or movement of animal and plant based products produced within or between countries.

In the *SPS Agreement*, SPS measures are defined as any measures applied:

- *to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms*

- *to protect human or animal life or health within the territory of the Member from risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs*

- *to protect human life or health within the territory of the Member from risks arising from diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests*

- *to prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests.*

The key provisions of the *SPS Agreement* are as follows:

- *An importing country has the sovereign right to adopt measures to achieve the level of protection it deems appropriate (its appropriate level of protection, or ALOP) to protect human or animal life or health within its territory, but such a level of protection must be consistently applied in different situations.*

- *An SPS measure must be based on scientific principles and not be maintained without sufficient evidence.*

- *In applying SPS measures, an importing country must avoid arbitrary or unjustifiable distinctions in levels of protection, if such distinctions result in discrimination or a disguised restriction on international trade.*

- *An SPS measure must not be more trade restrictive than necessary to achieve an importing country's ALOP, taking into account technical and economic feasibility.*

- *An SPS measure should be based on an international standard, guideline or recommendation, where these exist, except to the extent that there is scientific justification for a more stringent measure which is necessary to achieve an importing country's ALOP.*

- *An SPS measure conforming to an international standard, guideline or recommendation is presumed to be necessary to protect human, animal or plant life or health, and to be consistent with the SPS Agreement.*

- *Where an international standard, guideline or recommendation does not exist or where, in order to meet an importing country's ALOP, a measure needs to provide a higher level of protection than accorded by the relevant international standard, such a measure must be based on a risk assessment; the risk assessment must take into account available scientific evidence and relevant economic factors.*

- *When there is insufficient scientific evidence to complete a risk assessment, an importing country may adopt a provisional measure(s) by taking into account available pertinent information; additional information must be sought to allow a more objective assessment and the measure(s) reviewed within a reasonable period.*

- *An importing country must recognise the measures of other countries as equivalent, if it is objectively demonstrated that the measures meet the importing country's ALOP.*

The rights and obligations in the *SPS Agreement* must be read as a whole. The articles must be interpreted in relation to each other. That is, the articles do not stand alone.

In many instances, the biosecurity policies Biosecurity Australia develops are based on the relevant international standards, guidelines and recommendations. In certain instances and in conformity with rights under the *SPS Agreement,* Australia has not adopted such international norms because to do so would result in an unacceptably high level of risk of disease or pest entry and establishment. Instead, the policies are based on a risk analysis.

The text of the *SPS Agreement* can be found at the WTO Internet site.[1]

The following issues are discussed in greater detail below:

[1] Available at http://www.wto.org/english/docs_e/docs_e.htm

- notification obligations;
- use of international standards;
- equivalence;
- risk assessment;
- appropriate level of protection; and
- consistency in risk management.

Notification Obligations

The WTO SPS Committee has been established to oversee the implementation of the *SPS Agreement*, and to provide a forum for the discussion of any trade issues related to biosecurity policies. Like other WTO committees, all WTO Members have the right to participate in the work and decision making of the SPS Committee; decisions are taken by consensus. The SPS Committee has accepted, as observers, the Codex Alimentarius Commission (Codex), OIE and IPPC, as well as other international and regional intergovernmental organisations with activities in food safety, animal health and plant protection to maximise knowledge of and participation in its work.

The SPS Committee normally meets three times a year at the WTO headquarters in Geneva, Switzerland.

In addition to considering any specific trade concerns raised by governments, the *SPS Agreement* has set specific tasks for the Committee. One of these is to monitor the extent to which governments are using internationally developed standards as the basis for their requirements for imported products. Countries identify cases where the non-use, or non-existence, of an appropriate international standard is causing difficulties for international trade. After consideration by the SPS Committee, these concerns may be brought to the attention of the relevant standard-setting organisations.

Under the *SPS Agreement*, Members are required to notify WTO of new sanitary or phytosanitary regulations or modifications to existing regulations that are not substantially the same as the content of an international standard and that may have a significant effect on international trade. Australia notifies new measures and comments on draft policies proposed by other countries through the SPS Notification Point in AFFA.

Use of international standards

The *SPS Agreement* has conferred new responsibilities on three international organisations by requiring WTO Members to harmonise their sanitary and phytosanitary measures on the standards, guidelines and recommendations produced by those organisations unless there is scientific justification for a more stringent measure.

The three international organisations are referenced in Annex A of the *SPS Agreement* as follows:

- *for food safety, the standards, guidelines and recommendations established by the Codex Alimentarius Commission relating to food additives, veterinary drug and pesticide residues, contaminants, methods of analysis and sampling, and codes and guidelines ofhygienic practice*

- *for animal health and zoonoses, the standards, guidelines and recommendations developed under the auspices of the International Office of Epizootics*

- *for plant health, the international standards, guidelines and recommendations developed under the auspices of the Secretariat of the International Plant Protection Convention in cooperation with regional organizations operating within the framework of the International Plant Protection Convention.*

International Plant Protection Convention

IPPC is a multilateral treaty deposited with the Director-General of the Food and Agriculture Organization of the United Nations. IPPC provides a framework and forum for international cooperation, standards harmonisation and information exchange on plant health in collaboration with regional and national plant protection organisations (RPPOs and NPPOs). Its prime purpose is to secure common and effective action to prevent the spread and introduction of pests of plants and plant products and to promote measures for their control.

Currently, 117 governments are contracting parties to IPPC.

The New Revised Text of IPPC enabled the establishment of an Interim Commission on Phytosanitary Measures to serve as IPPC's new governing body. Membership in the Interim Commission is open to all contracting parties of IPPC. The Interim Commission meets annually to establish priorities for standard setting and harmonisation of phytosanitary measures in co-ordination with the IPPC Secretariat.

The functions of the Interim Commission are to provide direction to the work program of the IPPC Secretariat and promote the full implementation of the objectives of the Convention and, in particular, to:

- *review the state of plant protection in the world and the need for action to control the international spread of pests and control their introduction into endangered areas*

- *establish and keep under review the necessary institutional arrangements and procedures for the development and adoption of international standards, and to adopt international standards*

- *establish rules and procedures for the resolution of disputes*

- *cooperate with other relevant international organisations.*

The new IPPC and ISPM 11 (*Pest Risk Analysis for Quarantine Pests*) adopt a similar approach to that of OIE and notes the importance of documenting all steps in the process.

Equivalence

Article 4 of the *SPS Agreement* states that:

> *Members shall accept the sanitary or phytosanitary measures of other Members as equivalent, even if these measures differ from their own or from those used by other Members trading in the same product, if the exporting Member objectively demonstrates to the importing Member that its measures achieve the importing Member's appropriate level of sanitary or phytosanitary protection.*

Members must accept the SPS measures of other Members as equivalent to their own if the latter can demonstrate objectively that their measures provide the level of protection required by the importing country.

Article 5.6 of the *SPS Agreement* states that:

Often there are several alternative measures that may either singly or in combination achieve ALOP. In choosing among such alternatives, a Member should apply measures that are no more trade-restrictive than necessary to achieve its ALOP, taking into account technical and economic feasibility.

Risk assessment

Articles 5.1 to 5.3 of the *SPS Agreement* outline the requirements that Members should follow when carrying out risk assessment.

Article 5.1 provides a basic statement of the obligation:

> *Members shall ensure that their sanitary or phytosanitary measures are based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organisations.*

Annex A of the *SPS Agreement* contains two definitions of risk assessment; the following is the definition applicable to biosecurity assessments:

> *The evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences.*

On the basis of this definition, the Appellate Body examining Australia's appeal against the dispute settlement panel's finding on Australia's prohibition of imports of Canadian salmon considered that a risk assessment within the meaning of Article 5.1 must:

- identify the hazards whose entry, establishment or spread within its territory a Member wants to prevent, as well as the associated potential biological and economic consequences;

- evaluate the likelihood of entry, establishment or spread of these hazards, as well as the associated potential biological and economic consequences; and

- evaluate the likelihood of entry, establishment or spread of these hazards according to the SPS measures that might be applied; measures which might be applied are those which reduce the risks to the appropriate level, with the aim of being least trade restrictive.

The Appellate Body believed that, for a risk assessment to fall within the meaning of Article 5.1 and the first definition in paragraph 4 of Annex A of the Agreement, it is not sufficient that it conclude that there is a 'possibility' of entry, establishment or spread of pests and their associated biological and economic consequences. That is, an assessment must evaluate the 'likelihood' (the 'probability') of entry, establishment or spread of pests and their associated biological and economic consequences. Furthermore, likelihood should be evaluated without and then with any SPS measures that might be required.

Article 5.2 outlines factors that should be considered when assessing the risks associated with a proposed importation. Specifically, it states that:

> *In the assessment of risks Members shall take into account available scientific evidence; relevant processes and production methods; relevant inspection, sampling and testing methods; prevalence of specific diseases or pests; existence of pest- or disease-free areas; relevant ecological or environmental conditions; and quarantine or other treatment*

This paragraph emphasises the need to consider a wide range of factors in both the importing and exporting country.

Article 5.3 describes the need to include a consequence assessment in a risk assessment, and lists dimensions that should be considered when assessing 'potential damage' arising from a disease or pest incursion. Specifically, it states that:

> *Members shall take into account as relevant economic factors; the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the cost of control or eradication in the territory of the importing Member*

This list of 'relevant economic factors' may be viewed as the bare minimum that must be considered if an analysis is to comply with the terms of the *SPS Agreement*. In addition, both the *OIE Code* and IPPC standards for risk analysis have outlined factors that should be considered when assessing consequences. These two standards also stress the need to consider the 'likely magnitude' of consequences - that is, to base an assessment of consequences on the likelihood of various levels of damage in the importing country. Finally, Article 5.3 states that Members should consider '*... the relative cost-effectiveness of alternative approaches to limiting risks ...*'. This is an issue that should be explored during risk management. Among factors that may not be taken into account are those relating to import competition.

The environmental and ecological consequences of pest or disease introduction are legitimate considerations in a risk assessment. The SPS Agreement provides a basic right to take measures to protect animal or plant life or health (Article 2). In Annex A, 'animal' is defined to include fish and wild fauna; and 'plant' to include forests and wild flora.

Additional to the economic factors identified in Article 5.3, the definition of risk assessment in Annex A, paragraph 4 ('*... evaluation of the likelihood of entry, establishment or spread of a pest or disease … and of the associated potential biological and economic consequences ...*') provides for general consideration of the biological consequences, including those for the environment. The environment is included in paragraph 1(d), which states that an SPS measure is one that is applied

to ' ... *prevent or limit other damage to a country from the entry, establishment or spread of pests* ...'.

Appropriate level of protection

The *SPS Agreement* defines *'appropriate level of sanitary or phytosanitary protection'* as the level of protection deemed appropriate by the Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory. The *SPS Agreement* notes that many Members also refer to this concept as the *'acceptable level of risk'*. In setting their ALOP, Members are to take into account the objective of minimising negative trade effects (Article 5.4).

Determination of Australia's ALOP is an issue for government in consultation with the community - it is not a prerogative of the WTO. ALOP reflects government policy that is affected by community expectations; it is a societal value judgement to which AFFA contributes by providing technical information and advice. It is important to note that the *SPS Agreement* does not require a Member to have a scientific basis for its ALOP determination.

ALOP can be illustrated using a *risk estimation matrix* (Table 1). The cells of this matrix describe the product of likelihood and consequences - termed 'risk'.

When interpreting the risk estimation matrix it should be remembered that although the descriptors for each axis are similar ('low', 'moderate', 'high', etc.), the vertical axis refers to *likelihood* and the horizontal axis refers to *consequences*.

One implication of this is that a 'negligible' probability combined with 'extreme' consequences, is not the same as an 'extreme' probability combined with 'negligible' consequences - that is, that the matrix is *not symmetrical.* Another implication is that 'risk' is expressed in the same units as are used to estimate consequences – that is, risk is *not* a likelihood.

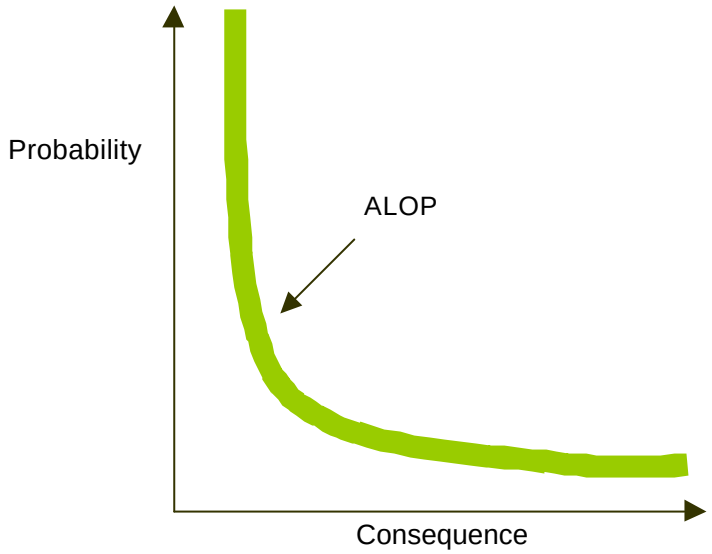
Table 1 Risk estimation matrix

Likelihood of entry, establishment and spread						
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
	Negligible impact	*Very low*	*Low*	*Moderate*	*High*	*Extreme impact*

Consequences of entry, establishment and spread

The band of cells in the table marked ‘very low’ represents Australia's ALOP, or tolerance of loss. This band of cells represents an approximation of a continuous ‘iso-risk curve’ - a curve that will be asymptotic at the minimum level of consequences considered to be ‘acceptable’ (which, in Australia's case, is ‘very low’) and at a likelihood that tends toward zero. The principle of an iso-risk curve is illustrated in Figure 1.

Figure 1 Theoretical iso-risk curve



Consistency in risk management

Article 5.5 states:

> *With the objective of achieving consistency in the application of the concept of appropriate level of sanitary or phytosanitary protection against risks to human life or health, or to animal and plant life or health, each Member shall avoid arbitrary or unjustifiable distinctions in the levels it considers to be appropriate in different situations, if such distinctions result in discrimination or a disguised restriction on international trade*

Members are obliged to avoid arbitrary or unjustifiable distinctions in the levels of protection applied in different situations, if such distinctions result in discrimination or a disguised restriction on international trade. This obligation reflects the objective of consistency in applying the concept of ALOP against risks to human, animal and plant life or health - that is, consistency in risk management. In other words, it is not open to a Member to arbitrarily vary its attitude to the acceptance of risk from one situation to another, where the situations are comparable.

Consistency is achieved in Biosecurity Australia's IRA process by using the risk estimation matrix (Table 1).

METHOD FOR PEST RISK ANALYSIS

The technical component of an IRA for plants or plant products is termed a 'pest risk analysis', or PRA. In accordance with the ISPM *Pest Risk Analysis for Quarantine Pests*[2], a PRA comprises three discrete stages:

- Stage 1: initiation of the PRA
- Stage 2: risk assessment
- Stage 3: risk management

The *initiation* of a risk analysis involves the identification of the pest(s) and pathways of concern that should be considered for analysis. *Risk assessment* comprises pest categorisation, assessment of the probability of introduction and spread, and assessment of the potential economic consequences (including environmental impacts). *Risk management* describes the evaluation and selection of options to reduce the risk of introduction and spread of a pest. Because the key objective of this *Technical Issues Paper* is to document the approach to and preliminary results of pest categorisation, this component of the PRA is discussed in further detail.

Under ISPM *Pest Risk Analysis for Quarantine Pests*, pest categorisation describes 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. The objective of pest categorisation is thus to screen an exhaustive pest list to identify those that require an in-depth examination of the likelihood and consequences of introduction and spread.

ELEMENTS OF PEST CATEGORISATION

In accordance with the ISPM *Pest Risk Analysis for Quarantine Pests* pest categorisation is based on the following elements or steps:

identity of the pest

presence or absence in the PRA area

regulatory status

potential for establishment and spread in the PRA area

potential for economic consequences (including environmental consequences) in the PRA area

A description of these elements of pest categorisation from the ISPM *Pest Risk Analysis for Quarantine Pests* is given below.

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

[2] PRA is used throughout this document as an abbreviation of Pest Risk Analysis. AFFA uses the term PRA to describe the technical component of an import risk analysis.

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 level. 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 that demonstrate, factors such as differences in virulence, host range and/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 the PRA area

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 the PRA area, it should be under official control or expected to be under official control in the near future.

Potential for establishment and spread in the PRA area

Evidence should be available to support the conclusion that the pest could become established or spread in the PRA area. 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 the PRA area.

Potential for economic consequences in the PRA area

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

THE IMPORTATION OF TAHITIAN LIMES FROM NEW CALEDONIA

This Technical Issues Paper identifies pests relevant to Tahitian lime (*Citrus latifolia* (Yu. Tanaka) Tanaka), and describes their occurrence in New Caledonia and Australia and their association with Tahitian lime. The remaining elements of pest categorisation will be presented and discussed within the draft IRA paper.

BACKGROUND

AQIS received an application from the Department of Agriculture and Forestry, New Caledonia (DAF-NC) in May 1996 seeking access for Tahitian limes to Australia. In response to this application, AQIS requested further technical information from New Caledonia. New Caledonia responded to AQIS's request and provided various technical submissions between 1996 and 1999. This information included pests and diseases recorded as being associated with Tahitian limes and statistics on the citrus industry in New Caledonia. The full report of non-host status studies of four economic fruit fly species on Tahitian limes conducted by New Caledonian authorities (Sales and Paulaud, 1995) was provided to AQIS in 1999. The methodology of the non-host status studies followed the procedures described in New Zealand National Agriculture Security Service (NASS) Standard 155.02.01.08 "Specification for Determination of Fruit Fly Host Status as a Treatment" (Anon., 1991a). Further information on the integrated pest management schedule recommended to export lime growers in New Caledonia was submitted to AQIS in September 1999.

Changes to the internal structure of the Department of Agriculture, Fisheries and Forestry – Australia (AFFA) resulted in the formation of Biosecurity Australia on 6 October 2000. Biosecurity Australia is responsible for the IRA function that was formerly the responsibility of AQIS.

ADMINISTRATION

Timetable

The tentative time frame for completion of the IRA is 2003. Further steps in the IRA process were outlined in Method for Risk Analysis in this paper. Given the nature of the task, Biosecurity Australia considers it is not prudent to give definitive time frames for these steps at this stage.

Scope

This IRA considers quarantine risks that may be associated with the importation to Australia of fresh individual Tahitian limes from New Caledonia (NC) and possible management measures to address those risks. In this IRA, fresh Tahitian limes are defined as the harvested individual fresh fruits of *C. latifolia* with all vegetative parts removed, that have been grown in registered orchards and stored and packed in facilities which are registered for that purpose in New Caledonia. Further, the individual limes have been produced, harvested, packed and stored using such chemical,

biological and physical pest control and management systems that are available, to reduce the level of risk posed by any harmful pest species which may be present.

Other anticipated assessments

In addition to potential pests directly associated with Tahitian limes in New Caledonia, there are other organisms that may be carried by the fruit (present on the import pathway). Biosecurity Australia calls these hitch-hikers. These hitch-hikers could pose a risk to the environment. For this IRA, AFFA proposes that such hitch-hikers be categorised and assessed in the same way as pests. In this Technical Issues Paper, one hitch-hiker was identified (*Wasmannia auropuncta* – the little fire ant).

AUSTRALIA'S CURRENT QUARANTINE POLICY FOR IMPORTS OF FRESH LIMES

International quarantine policy

Currently, Australia allows importation of fresh limes of *C. latifolia* (Tahitian lime), *C. aurantifolia* (West Indian lime), *C. hysterix* (Kaffir lime) and *C. limonia* (Rangpur lime) from New Zealand, Spain and the USA (Arizona, California and Texas only).

Further details of the import requirements for limes are available at the ICON website http://www.aqis.gov.au/icon.

Domestic arrangements

While the Commonwealth Government is responsible for regulating the movement of 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.

THE LIME/LEMON INDUSTRY

Production of limes and lemons in Australia

As there are no separate production statistics for limes and lemons, a joint summary will be given. Australia currently has a small lime and lemon industry. Limes and lemons are used largely as cooking ingredients and in the beverage industry. They are grown in citrus growing areas in New South Wales (NSW), Northern Territory (NT), Queensland (Qld), South Australia (SA), Victoria (Vic), and Western Australia (WA) (Table 2 and Table 3). Tahitian limes are mainly grown in the tropical and sub-tropical regions of the NT (Katherine and Darwin regions) and Qld. Tahitian limes are harvested in the NT from October/November to June/July, with the Qld fruit being harvested between January/February to October (Ngo, 1998).

Table 2 Australian lime and lemon planting statistics 1998/1999

Region	Lemons (Number)		Limes (Number)	
	Non bearing trees	Bearing trees	Non bearing trees	Bearing trees
Riverina (NSW)	11,706	27,433	612	0
Sunraysia/Mid Murray (NSW and Vic)	12,620	57,554	275	790
Riverland (SA)	23,053	83,471	4,893	964
Queensland	31,722	29,322	2,338	3,933
WA	3,552	10,849	1,327	1,571
NT	NA	NA	NA	NA
Total trees	82,653	208,629	9,445	7,258

From: 51st Annual Report 1999: Australian Citrus Growers (Anon., 1999b)

Table 3 Australian production of limes and lemons by states from 1997 to 1999 and gross value of production.

State	**1997-98**		**1998-99**	
	Production (Tonnes)	**Gross values ($M)**	**Production (Tonnes)**	**Gross values ($M)**
NSW	4,809	3.8	6,251	6.0
NT	17	Not available	31	Not available
Qld	5,828	6.6	7,178	5.6
SA	11,492	6.7	10,225	5.3
Vic	5,744	5.0	4,001	4.1
WA	819	0.7	1,607	1.6
Total	**28,709**	**22.8**	**29,293**	**22.6**

Source: ABS 7113.0, 1997-98 (Anon., 1998b, c); 1998-99 (Anon., 1999a).

The average price of limes during the summer months is around $2-$4/kg. During 1999-2000, Australia imported around 1,660 tonnes of limes and lemons, mostly from the USA (Anon. 2001).

Export of Australian limes and lemons

In 1999-2000, Australia exported a total of 4,520 tonnes of limes/lemons to Brunei, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Papua New Guinea, Philippines, Russia, Singapore, USA, UK and The Netherlands (anon. 2001).

The lime industry in New Caledonia

The New Caledonian citrus industry is located in three main areas; La Foa (110 km from Noumea), Boulouparis (50 km from Noumea) and Dumbea (30 kms north of Noumea) (Fig. 2). All citrus production in New Caledonia is for the local market, with the exception of Tahitian limes, which are also exported to New Zealand (12.9 tonnes in 1995, 9.6 tonnes in 1996 and 7-8 tonnes in 1997).

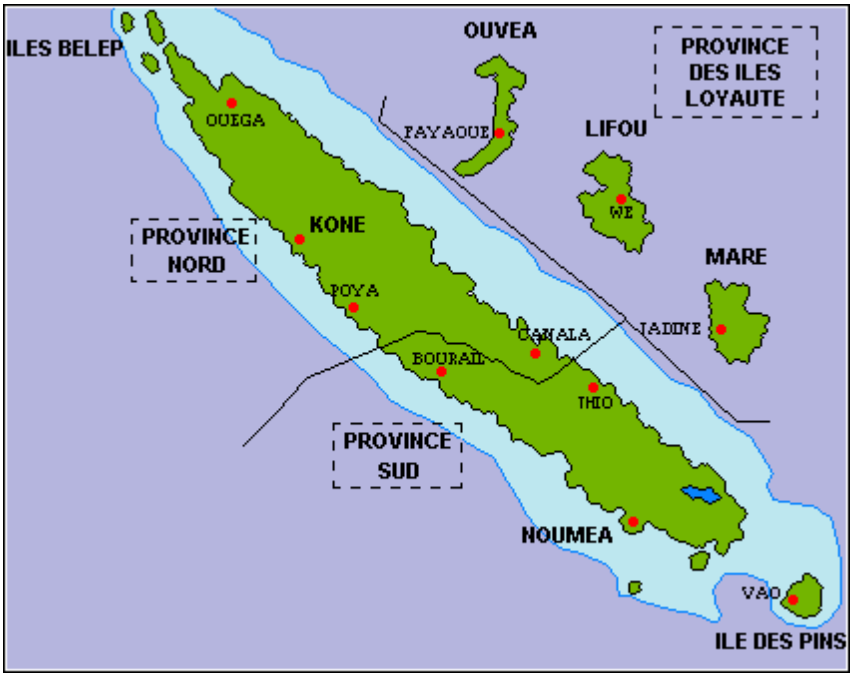


Figure 2 Map of New Caledonia.

Production statistics and harvesting seasons for citrus fruit for New Caledonia are given in Table 4.

Table 4 New Caledonian citrus production and harvesting seasons.

Variety	Harvest season	1997 Production (tonnes)
Tahitian lime: *Citrus latifolia* (Yu Tanaka) Tanaka	December – April	90
West Indian lime: *C. aurantifolia* (Christm.) Swingle	All year with a peak in July and a down turn in October – November	27
Orange: *C. sinensis* L., navels and valencia	March to November (imports from Australia substitute local production from January to March)	650
Grapefruit: *C. paradisi* Macf.	March to September with peak in July	8
Pomelo: *C. maxima* (Burm.) Merr.; *C. grandis* (L.) Osbeck	March to September with peak in July	33
Tangelo: *C. reticulata* Blanco X *C. paradisi* Macf.	March to September with peak in July	6.5
Mandarin: *C. reticulata* Blanco	April to August with a peak in June – July	141

Source: New Caledonian Chamber of Agriculture (1998).

RESULTS OF PEST CATEGORISATION

The first stage of pest categorisation for Tahitian limes is presented in Appendices 1, 2 and 3. Appendix 1 contains the potential pests and hitch-hikers associated with Tahitian limes based on their presence or absence in Australia (or present and under official control). Appendix 2 indicates whether the potential pest or hitch-hikers occurs on the pathway under consideration in this IRA. Appendix 3 summarises the species that are to be considered in the second stage.

A summary of the total number of micro-organisms/organisms (arthropods, nematodes, fungi etc.) known to be associated with Tahitian lime in the New Caledonia and Australia is given in Table 5. The organisms are categorised as present in Australia, present in Australia but subject to area freedom, under official control or not present in Australia. A number of organisms are not recorded in Western Australia and have been separated into the "subject to area freedom" category at this stage of the pest categorisation.

Table 5 Numbers of potential pests and hitch-hikers associated with Tahitian limes in New Caledonia and Australia

Organism type	Associated with Tahitian limes	Present in Australia	Present in Australia, but subject to area freedom	Under official control in Australia	Not present in Australia
Arthropod pests	58	21	16	1	18 (+2*)
Arthropod hitch-hikers	1	0	0	0	1
Algae	1	0	1	0	0
Fungi	13	6	4	0	3
Viruses	2	2	0	0	0
Total	**75**	**29**	**21**	**1**	**24**

* The level of identification for two of the arthropod pests is only to the genus level, therefore it is uncertain whether they occur in Australia.

Table 6 summarises the number of the potential pests and hitch-hikers associated with Tahitian lime in New Caledonia that may occur on the pathway of limes entering Australia. These potential pests will require further consideration during the IRA.

Table 6 Numbers of potential pests and hitch-hikers on the import pathway (individual fruit) for further consideration

Organism type	Number of potential species	Occurrence on limes – consider further
Arthropod – pests	37	17
Arthropod – hitch-hikers	1	1
Algae	0	0
Fungi	7	3
Viruses	0	0
Total	**45**	**21**

Arthropod pests

Fifty eight arthropod pests and one hitch-hiker are known for Tahitian lime in New Caledonia. Of these pests, 21 occur in Australia, 16 occur in Australia but are subject to area freedom, 1 is under official control (*Bactrocera tryoni*), 18 do not occur in Australia and the status of 2 is unclear as they are only identified to genus level (*Acrocercops* spp.; *Xylotes* spp.). For the remaining pests, whether they occur on the pathway is considered (Table 6). The 16 species are categorised as subject to area freedom based on not being recorded in Western Australia. Based on presence or absence on the pathway, 17 arthropods pests will require further consideration during the IRA. The single hitch-hiker (*Wasmannia auropunctata*) will also require further consideration.

Pathogen pests

Of the 16 pathogens (algae, fungi and viruses), two do not occur in Australia and five are subject to area freedom. Three pathogens are on the pathway and will require further consideration in the IRA. *Diaporthe citri* is subject to area freedom, *Meliola citrocola* is not present in Australia and different pathotypes of *Sphaceloma fawcettii* may occur in Australia and New Caledonia.

CONCLUDING REMARKS

Many of the pests associated with Tahitian lime in New Caledonia occur in Australia or are not present on the import pathway (i.e. do not occur on fruit). These pests do not need to be considered further in the IRA. The second stage of the pest categorisation will be completed following further analysis and stakeholder consultation. The final results of the pest categorisation and the complete risk assessment phase will be fully documented and released in the draft IRA paper. This next stage will determine whether the pests and hitch-hiker are of economic significance and whether they have the potential to establish and spread in Australia.

FURTHER STEPS IN THE IMPORT RISK ANALYSIS PROCESS

The IRA process requires that the following steps be followed:

- Release of the draft IRA paper for stakeholder comment
  - comment to be received within 60 days
- Consideration of stakeholder comment on the draft IRA paper
  - further stakeholder consultation as necessary
- Preparation of the final IRA paper
- Submission of recommendations to the Director of Animal and Plant Quarantine
- Consideration of recommendations by the Director of Animal and Plant Quarantine and final determination
- Release of the final IRA paper
- Consideration of any appeals
- If no appeals, or if appeals are rejected, adoption of the quarantine policy.

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

Biosecurity Australia is committed to a thorough risk analysis of the proposed importation of Tahitian limes from New Caledonia. This analysis requires that technical information be gathered from a wide range of sources. The timely contribution of information that may be difficult to source would be much appreciated[3].

[3] Contact details for stakeholder contributions are provided in the accompanying Plant Biosecurity Policy Memorandum (PBPM).

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APPENDICES

APPENDIX 1 PEST CATEGORISATION FOR TAHITIAN LIME

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
ARTHROPODS						
Acari [mites]						
Brevipalpus phoenicis Geijskes [Acarina: Tenuipalpidae]	red crevice mite	yes	CABI (2000)	yes	Brun and Chazeau (1980)	no
Phyllocoptruta oleivora Ashmead [Acari: Eriophyidae]	citrus rust mite	yes* (not in WA)	Smith *et al.* (1997); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Polyphagotarsonemus latus Banks [Acari: Tarsonemidae]	broad mite	yes	Smith *et al.* (1997)	yes	Brun and Chazeau (1980)	no
Tetranychus neocaledonicus Andre [Acari: Tetranychidae]	vegetable spider mite	yes* (not in WA)	Smith *et al.* (1997)	yes	Brun and Chazeau (1980)	yes

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
Coleoptera [beetles; weevils]						
Bradymerus amicorum Kulzer [Coleoptera: Tenebrionidae]	beetle	no	NA	yes	Brun and Chazeau (1980)	yes
Onidistus pacificus Pascoe [Coleoptera: Curculionidae]	weevil	no	NA	yes	Brun and Chazeau (1980)	yes
Plintheria dufouri Montrouzier [Coleoptera: Anthribidae]	beetle	no	NA	yes	Brun and Chazeau (1980)	yes
Xylotoles sp. [Coleoptera: Cerambycidae]	longhorn beetle	uncertain	NA	yes	Brun and Chazeau (1980)	yes
Diptera [flies]						
Bactrocera curvipennis (Froggatt) [Diptera: Tephritidae]	banana fruit fly	no	NA	yes	Amice and Sales (1996)	yes
Bactrocera psidii (Froggatt) [Diptera: Tephritidae]	South sea guava fruit fly	no	NA	yes	Amice and Sales (1996)	yes
Bactrocera tryoni Froggatt [Diptera: Tephritidae]	Queensland fruit fly	yes (under official control in some regions)	Drew (1989)	yes	Amice and Sales (1996)	yes

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
Bactrocera umbrosa Fabricius [Diptera: Tephritidae]	fruit fly	no	NA	yes	Amice and Sales (1996)	yes
Dirioxa pornia Walker [Diptera: Tephritidae]	South sea fly, Island fruit fly	yes	White and Elson-Harris (1994)	yes	Brun and Chazeau (1980)	no
Pulvinaria psidii Maskell Syn. *Pulvinaria darwiniensis* Froggatt [Diptera: Chloropidae]	soft scale	yes* (not in WA)	Smith *et al.* (1997); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Hemiptera [aphids; leafhoppers; mealybugs; psyllids; scales; true bugs; whiteflies]						
Aonidiella aurantii Maskell [Hemiptera: Sternorrhyncha: Diaspididae]	red scale	yes	Smith *et al.* (1997)	yes	Brun and Chazeau (1980)	no
Aphis gossypii Glover [Hemiptera: Sternorrhyncha: Aphidae]	cotton aphid	yes	Smith *et al.* (1997)	yes	Brun and Chazeau (1980)	no
Bemisia giffardi Dumbleton Syn. *Asterobemisia helyi* (Kotinsky) [Hemiptera: Sternorrhyncha: Aleyrodidae]	Giffardi white fly	yes* (not in WA)	Carver and Reid (1996); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Ceresium flavipes (Fabricius) [Hemiptera: Membracidae]	longhorn beetle	no	NA	yes	Brun and Chazeau (1980)	yes

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
Ceroplastes ceriferus Fabricius [Hemiptera: Coccoidea: Coccidae]	wax scale	yes	Smith *et al.* (1997)	yes	Brun and Chazeau (1980)	no
Ceroplastes rubens Maskell [Hemiptera: Coccoidea: Coccidae]	pink waxy scale	yes	Smith *et al.* (1997)	yes	Brun and Chazeau (1980)	no
Chrysomphalus aonidium Linnaeus Syn. *Chrysomphalus ficus* Ashmead [Hemiptera: Coccoidea: Diaspididae]	purple scale	yes* (not in WA)	Smith *et al.* (1997); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Coccus hesperidum Linnaeus [Hemiptera: Coccoidea: Coccidae]	soft scale	yes	CABI (2000)	yes	Ben-Dov (1993); Williams and Watson (1990)	no
Coccus longulus Douglas Syn. *Coccus elongatus* (Sing.) [Hemiptera: Coccoidea: Coccidae]	long brown scale	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Coccus viridis Green [Hemiptera: Coccoidea: Coccidae]	soft green scale	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Euricania translucida Melichar [Hemiptera: Ricaniidae]	leafhopper	no	NA	yes	Brun and Chazeau (1980)	yes
Ferrisia virgata Cockerell [Hemiptera: Coccoidea: Pseudococcidae]	striped mealybug	yes* (not in WA)	CABI (2000); Stuart (2000); Williams (1985)	yes	Brun and Chazeau (1980)	yes
Icerya purchasi Maskell	cottony cushion	yes	Smith *et al.* (1997)	yes	Brun and Chazeau (1980)	no

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
[Hemiptera: Coccoidea: Margarodidae]	scale					
Icerya seychellarum Westwood [Hemiptera: Coccoidea: Margarodidae]	seychelles fluted scale	yes	Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no
Lepidosaphes beckii Newman [Hemiptera: Coccoidea: Diaspididae]	mussel scale	yes	Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no
Lepidosaphes gloverii Packard [Hemiptera: Coccoidea: Diaspididae]	glover scale	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Lopholeucaspis cockerelli (Grandpré & Charmoy) [Hemiptera: Coccoidea: Diaspididae]	diaspine scale	no	NA	yes	Brun and Chazeau (1980)	yes
Mictis profana Fabricius [Hemiptera: Coreidae]	crusader bug	yes	Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no
Morganella longispina Morgan [Hemiptera: Coccoidea: Diaspididae]	plumose scale	yes* (not in WA)	Naumann (1993)	yes	Brun and Chazeau (1980)	yes
Nezara viridula Linnaeus [Hemiptera: Pentatomidae]	green vegetable bug	yes	CABI (2000); Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no
Nipaecoccus filamentosus (Cockerell) [Hemiptera: Coccoidea: Pseudococcidae]	mealybug	no	NA	yes	Brun and Chazeau (1980)	yes

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
Nipaecoccus viridis Newstead Syn. *Nipaecoccus vastator* Maskell [Hemiptera: Coccoidea: Pseudococcidae]	spherical mealybug	yes* (not in WA)	CABI (2000)	yes	Brun and Chazeau (1980)	yes
Orchamoplatus caledonicus Dumbleton [Hemiptera: Sternorrhyncha: Aleyrodidae]	white fly	no	NA	yes	Brun and Chazeau (1980)	yes
Orchamoplatus dentatus Dumbleton [Hemiptera: Sternorrhyncha: Aleyrodidae]	white fly	no	NA	yes	Brun and Chazeau (1980)	yes
Orchamoplatus dumbletoni Cohic [Hemiptera: Sternorrhyncha: Aleyrodidae]	white fly	no	NA	yes	Brun and Chazeau (1980)	yes
Orchamoplatus noumeae Russell [Hemiptera: Sternorrhyncha: Aleyrodidae]	white fly	no	NA	yes	Brun and Chazeau (1980)	yes
Parlatoria cinerea Hadden [Hemiptera: Diaspididae]	tropical grey chaff scale	no	NA	yes	Brun and Chazeau (1980)	yes
Pinnaspis aspidistrae Signoret [Hemiptera: Coccoidea: Diaspididae]	fern scale	yes	CIE (1977)	yes	Brun and Chazeau (1980)	no
Planococcus citri Risso	citrus mealybug	yes	Williams (1985)	yes	Brun and Chazeau (1980)	no

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
[Hemiptera: Coccoidea: Pseudococcidae]						
Pseudaonidia trilobitiformis Green [Hemiptera: Coccoidea: Diaspididae]	trilobite scale	yes* (not in WA)	CABI (2000)	yes	Brun and Chazeau (1980)	yes
Tectocoris diophthalmus (Thunberg) [Hemiptera: Coccoidea: Scutelleridae]	cotton harlequin bug	yes	Page (1970)	yes	Amice (1998)	no
Toxoptera aurantii Boyer [Hemiptera: Aphidoidea: Aphididae]	black citrus aphid	yes	Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no
Unaspis citri Comstock [Hemiptera: Coccoidea: Diaspididae]	citrus snow scale	yes* (not in WA)	Smith *et al*. (1997); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Lepidoptera [butterflies; moths]						
Acrocercops spp. [Lepidoptera: Gracillariidae]	leafminer	uncertain	NA	yes	Brun and Chazeau (1980)	yes
Eudocima fullonia Clerck Syn. *Othreis fullonia* Linnaeus [Lepidoptera: Noctuidae]	fruit piercing moth	yes	CABI (2000); Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no
Eudocima materna Linnaeus Syn. *Othreis materna* Linnaeus [Lepidoptera: Noctuidae]	fruit piercing moth	yes	CABI (2000); Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
Eudocima salaminia Cramer [Lepidoptera: Noctuidae]	fruit piercing moth	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Brun and Chazeau (1980)	yes
Ophiusa coronata Fabricius [Lepidoptera: Noctuidae]	fruit piercing moth	no	NA	yes	Brun and Chazeau (1980)	yes
Papilio anactus W.S. Macleay [Lepidoptera: Papilionidae]	small citrus butterfly	yes	Nielsen *et al*. (1996)	yes	Brun and Chazeau (1980)	no
Papilio ilioneus amynthor Boisduval [Lepidoptera: Papilionidae]	citrus swallowtail	no	NA	yes	Brun and Chazeau (1980)	yes
Papilio montrouzieri Boisduval [Lepidoptera: Papilionidae]	citrus swallowtail	no	NA	yes	Brun and Chazeau (1980)	yes
Phyllocnistis citrella Stainton [Lepidoptera: Gracillaridae]	Asian leafminer	yes	CABI (2000); Smith *et al*. (1997)	yes	Brun and Chazeau (1980)	no
Serrodes campana Guenée [Lepidoptera: Noctuidae]	fruit piercing moth	yes* (not in WA)	Common (1990); Nielsen *et al*. (1996)	yes	Brun and Chazeau (1980)	yes
Serrodes mediopallens A.E. Prout [Lepidoptera: Noctuidae]	fruit piercing moth	yes* (not in WA)	Nielsen *et al*. (1996)	yes	Brun and Chazeau (1980)	yes

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
HITCH-HIKERS						
Wasmannia auropunctata (Roger) [Hymenoptera: Formicidae]	little fire ant	no	NA	yes	Fabres and Brown (1978)	yes
ALGAE						
Cephaleuros virescens Kunze	algal disease	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Kolher (1987)	yes
FUNGI						
Botryodiplodia theobromae Pat.	diplodia stem-end rot	yes	CABI (2000)	yes	Kolher (1987)	no
Cochliobolus geniculatus Nelson (anamorph *Curvularia geniculata* Tracy & Earle) Boedijn	root rot	no	NA	yes	Kolher (1987)	yes
Corticium salmonicolor Berk. & Broome	pink disease	yes* (not in WA)	CABI (2000)	yes	Kolher (1987)	yes
Diaporthe citri Wolf	melanose	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Kolher (1987)	yes
Geotrichum candidum Link	sour rot	yes	CABI (2000)	yes	Kolher (1987)	no
Glomerella cingulata (Stonem.) Spaulding & Schrenk	anthracnose, fruit rot	yes	CABI (2000)	yes	Kolher (1987)	no

Pest[1]	Common name/s	Present in Australia[2]	Reference	Present in New Caledonia	Reference	Consider further[3]
Meliola citricola H. Sydow & Sydow	sooty mould	no	NA	yes	Kolher (1987)	yes
Penicillium digitatum Saccardo	green mould	yes	CABI (2000); Stuart (2000)	yes	Kolher (1987)	no
Penicillium italicum Wehmer	blue mold	yes	CABI (2000)	yes	Kolher (1987)	no
Phellinus noxius (Corner) G. Cunn.	brown root rot	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Kolher (1987)	yes
Phytophthora nicotianae Breda de Haan Syn = *Phytophthora parasitica* (Dastur)	root and collar rot	yes* (not in WA)	CABI (2000); Stuart (2000)	yes	Kolher (1987)	yes
Septobasidium crustaceum Couch	Felty fungus	yes	CABI (2000)	yes	Kolher (1987)	no
Sphaceloma fawcettii Jenkins	citrus scab	yes (possibly a different pathotype)	CABI (2000); Barkley (1998)	yes	Kolher (1987)	yes
VIRUSES						
Citrus ringspot virus (CRSV)	citrus scaly bark, psorosis of citrus	yes	Fraser and Broadbent (1979)	yes	Kolher (1987)	no
Citrus tristeza closterovirus (CTV)	tristeza, quick decline, grapefruit stem pitting, lime dieback	yes	CABI (2000)	yes	Kolher (1987)	no

NA No known record of this species in Australia.

* Comment from Agriculture WA (Mark Stuart, personal communication), and will only be considered further for imports into WA.

[1] The initial list contains all pests known to be associated with Tahitian lime in New Caledonia.

[2] As described in Pest Categorisation (see *Method for Stage 2: Risk assessment*).

[3] Pest present in New Caledonia, but not in Australia or present but officially controlled, are considered further in the 'present on pathway' stage of pest categorisation.

[4] Describes whether the pest is associated with fresh individual limes and therefore if it is on the pathway.

[5] Pests that are known to be associated with individual fruit and either not present in Australia or present but officially controlled, are considered further in the second stage of pest categorisation.

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APPENDIX 2 PEST CATEGORISATION FOR TAHITIAN LIMES (PATHWAY ASSOCIATION)

Pest[1]	Common name/s	Present on the pathway[4]	Reference	Consider pest further[5]
ARTHROPODS				
Acari [mites]				
Phyllocoptruta oleivora Ashmead [Acari: Eriophydae]	citrus rust mite	yes	CABI (2000); Smith *et al*. (1997)	yes
Tetranychus neocaledonicus Andre [Acari: Tetranychidae]	vegetable spider mite	no	Smith *et al*. (1997)	no
Coleoptera [beetles; weevils]				
Bradymerus amicorum Kulzer [Coleoptera: Tenebrionidae]	beetle	no	Mademba-Sy (1999)	no
Onidistus pacificus Pascoe [Coleoptera: Curculioidae]	weevil	no	Lawrence and Britton (1991)	no
Plintheria dufouri Montrouzier [Coleoptera; Anthribidae]	beetle	no	Kuschel (1998)	no

Pest[1]	Common name/s	Present on the pathway[4]	Reference	Consider pest further[5]
Xylotoles sp. [Coleoptera: Cerambycidae]	longhorn beetle	no	Kuschel (1990)	no
Diptera [flies]				
Bactrocera curvipennis (Froggatt) [Diptera: Tephritidae]	banana fruit fly	yes	Drew (1989); Drew *et al*. (1982)	yes
Bactrocera psidii (Froggatt) [Diptera: Tephritidae]	South sea guava fruit fly	yes	Drew (1989); Drew *et al*. (1982)	yes
Bactrocera tryoni Froggatt [Diptera: Tephritidae]	Queensland fruit fly	yes	Drew (1989); Drew *et al*. (1982)	yes
Bactrocera umbrosa Fabricius [Diptera: Tephritidae]	fruit fly	yes	Drew (1989); Drew *et al*. (1982)	yes
Pulvinaria psidii Maskell Syn. *Pulvinaria darwiniensis* Froggatt [Diptera: Chloropidae]	soft scale	yes	Smith *et al*. (1997); Williams and Watson (1990)	yes
Hemiptera [aphids; leafhoppers; mealybugs;psyllids; scales; true bugs; whiteflies]				
Bemisia giffardi Dumbleton Syn. *Asterobemisia helyi* (Kotinsky) [Hemiptera: Sternorryncha]	Giffardi white fly	no	Brun and Chazeau (1980)	no

Pest[1]	Common name/s	Present on the pathway[4]	Reference	Consider pest further[5]
Ceresium flavipes (Fabricius) [Hemiptera: Membracidae]	longhorn beetle	no	Humble *et al.* (1996)	no
Chrysomphalus aonidium Linnaeus Syn. *Chrysomphalus ficus* Ashmead [Hemiptera: Coccoidea: Coccidae]	purple scale	yes	CABI (2000); Smith *et al.* (1997)	yes
Coccus longulus Douglas Syn. *Coccus elongatus* (Sing.) [Hemiptera: Coccoidea: Coccidae]	long brown scale	yes	Smith *et al.* (1997)	yes
Coccus viridis Green [Hemiptera: Coccoidea: Coccidae]	soft green scale	yes	CABI (2000); Smith *et al.* (1997)	yes
Euricania translucida Melichar [Hemiptera: Ricaniidae]	leafhopper	no	Chou *et al.* (1985)	no
Ferrisia virgata Cockerell Hemiptera: Coccoidea: Margarodidae]	striped mealybug	yes	CABI (2000)	yes
Lepidosaphes gloverii Packard [Hemiptera; Coccoidea: Diaspididae]	glover scale	yes	CABI (2000); Smith *et al.* (1997)	yes
Lopholeucaspis cockerelli (Grandpré & Charmoy) [Hemiptera; Coccoidea: Diaspididae]	diaspine scale	yes	Williams and Watson (1988)	yes

Pest[1]	Common name/s	Present on the pathway[4]	Reference	Consider pest further[5]
Morganella longispina Morgan [Hemiptera; Coccoidea: Diaspididae]	plumose scale	yes	Hamon (1981)	yes
Nipaecoccus filamentosus (Cockerell) [Hemiptera; Coccoidea: Pseudococcidae]	mealybug	yes	CABI (2000)	yes
Nipaecoccus viridis Newstead Syn. *Nipaecoccus vastator* Maskell [Hemiptera; Coccoidea: Pseudococcidae]	spherical mealybug	yes	CABI (2000); Smith *et al*. (1997)	yes
Orchamoplatus caledonicus Dumbleton [Hemiptera: Aleyrodidae]	white fly	no	Martin (1985); Nguyen *et al*. (1993)	no
Orchamoplatus dentatus Dumbleton [Hemiptera: Aleyrodidae]	white fly	no	Mound and Halsey (1978)	no
Orchamoplatus dumbletoni Cohic [Hemiptera: Aleyrodidae]	white fly	no	Mound and Halsey (1978)	no
Orchamoplatus noumeae Russell [Hemiptera: Aleyrodidae]	white fly	no	Mound and Halsey (1978)	no
Parlatoria cinerea Hadden [Hemiptera: Diaspididae]	tropical grey chaff scale	yes	Williams and Watson (1988)	yes
Pseudaonidia trilobitiformis Green [Hemiptera: Coccoidea: Diaspididae]	trilobite scale	no	CABI (2000)	yes

Pest[1]	Common name/s	Present on the pathway[4]	Reference	Consider pest further[5]
Unaspis citri Comstock [Hemiptera: Coccoidea: Diaspididae]	citrus snow scale	yes	CABI (2000); Smith *et al*. (1997)	yes
Lepidoptera [butterflies; moths]				
Acrocercops spp. [Lepidoptera: Gracillariidae]	leafminer	no	CABI (2000); Nielsen and Common (1991)	no
Eudocima salaminia Cramer [Lepidoptera: Noctuidae]	fruit piercing moth	no	CABI (2000)	no
Ophiusa coronata Fabricius [Lepidoptera: Noctuidae]	fruit piercing moth	no	CABI (2000)	no
Papilio ilioneus amynthor Boisduval [Lepidoptera: Papilionidae]	citrus swallowtail	no	Holloway and Peters (1976)	no
Papilio montrouzieri Boisduval [Lepidoptera: Papilionidae]	citrus swallowtail	no	Holloway and Peters (1976)	no
Serrodes campana Guenée [Lepidoptera: Noctuidae]	fruit piercing moth	no	Common (1990)	no
Serrodes mediopallens A.E. Prout [Lepidoptera: Noctuidae]	fruit piercing moth	no	Nielsen *et al.* (1996)	no

Pest[1]	Common name/s	Present on the pathway[4]	Reference	Consider pest further[5]
HITCH-HIKERS				
Wasmannia auropunctata (Roger) [Hymenoptera: Formicidae]	little fire ant	yes	Fabres and Brown (1978)	yes
ALGAE				
Cephaleuros virescens Kunze	red rust	no	CABI (2000)	no
FUNGI				
Cochilobolus geniculatus Nelson (*Curvularia geniculata* Tracy & Earle) Boedijn	root rot	no	CABI (2000)	no
Corticium salmonicolor Berk. & Broome	pink disease	no	CABI (2000)	no
Diaporthe citri Wolf	melanose	yes	Kolher (1987); CABI (2000)	yes
Meliola citricola H. Sydow & Sydow	sooty mould	yes	Kolher (1987); Lim (1975)	yes
Phellinus noxius (Corner) G. Cunn.	brown root rot	no	CABI (2000)	no
Phytophthora parasitica (Dastur)	root and collar rot	no	CABI (2000)	
Sphaceloma fawcettii Jenkins	citrus scab	yes	Kolher (1987); CABI (2000)	yes

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APPENDIX 3 PESTS THAT WILL REQUIRE FURTHER EVALUATION IN THE IRA.

Pest[1]	Common name/s	Consider pest further[5]
ARTHROPODS		
Bactrocera curvipennis (Froggatt) [Diptera: Tephritidae]	banana fruit fly	yes
Bactrocera psidii (Froggatt) [Diptera: Tephritidae]	South sea guava fruit fly	yes
Bactrocera tryoni Froggatt [Diptera: Tephritidae]	Queensland fruit fly	yes
Bactrocera umbrosa Fabricius [Diptera: Tephritidae]	fruit fly	yes
Chrysomphalus aonidium Linnaeus Syn. *Chrysomphalus ficus* Ashmead [Hemiptera: Coccoidea: Coccidae]	purple scale	yes
Coccus longulus Douglas Syn. *Coccus elongatus* (Sing.) [Hemiptera: Coccoidea: Coccidae]	long brown scale	yes
Coccus viridis Green [Hemiptera: Coccoidea: Coccidae]	soft green scale	yes
Ferrisia virgata Cockerell Hemiptera: Coccoidea: Margarodidae]	striped mealybug	yes
Lepidosaphes gloverii Packard [Hemiptera; Coccoidea: Diaspididae]	glover scale	yes
Lopholeucaspis cockerelli (Grandpré & Charmoy) [Hemiptera; Coccoidea: Diaspididae]	diaspine scale	yes
Morganella longispina Morgan [Hemiptera; Coccoidea: Diaspididae]	plumose scale	yes
Nipaecoccus filamentosus (Cockerell) [Hemiptera; Coccoidea: Pseudococcidae]	mealybug	yes

Pest[1]	Common name/s	Consider pest further[5]
Nipaecoccus viridis Newstead Syn. *Nipaecoccus vastator* Maskell [Hemiptera; Coccoidea: Pseudococcidae]	spherical mealybug	yes
Parlatoria cinerea Hadden [Hemiptera: Diaspididae]	tropical grey chaff scale	yes
Phyllocoptruta oleivora Ashmead [Acari: Eriophydae]	citrus rust mite	yes
Pulvinaria psidii Maskell Syn. *Pulvinaria darwiniensis* Froggatt [Diptera: Chloropidae]	soft scale	yes
Unaspis citri Comstock [Hemiptera: Coccoidea: Diaspididae]	citrus snow scale	yes
HITCH-HIKING AGENTS		
Wasmannia auropunctata (Roger) [Hymenoptera: Formicidae]	little fire ant	yes
FUNGI		
Diaporthe citri Wolf	melanose	yes
Meliola citricola H. Sydow & Sydow	sooty mould	yes
Sphaceloma fawcettii Jenkins	citrus scab	yes