Australian Banana Growers' Council Inc

Submission to Senate Rural and Regional Affairs Committee in relation to inquiry into import risk analysis for bananas from the Philippines

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1 EXECUTIVE SUMMARY

The IRA Team released a draft IRA Report in June 2002 (the "First Report") which recommended against allowing the importation of bananas from the Philippines. It did so on the basis that despite the risk of Moko exceeding Australia's appropriate level of protection, it could not identify any feasible risk management measures for Moko.

The same IRA Team released a revised draft IRA Report in February 2004 (the "Second Report") which recommends permitting the importation of bananas from the Philippines.

In the Second Report, the IRA Team, apparently at BA's direction, adopted a more risk tolerant approach to risk assessment through the use of the median (50^{th} percentile) rather than the more conservative 95^{th} percentile. This should be questioned.

In addition, the IRA Team significantly reduced its assessment of the risks of Moko, Black Sigatoka and mealybugs despite there being no new scientific research since the release of the First Report which advances the understanding of the biology and epidemiology of those pests and diseases. This should be questioned.

The IRA Team has recommended an area of low pest prevalence ("ALPP") regime as a risk management measure for Moko despite concluding in the First Report that a very similar regime (area freedom) would be impossible. The considerations which the IRA Team considered made an area freedom regime impossible are directly applicable to an ALPP regime. This should be questioned.

The recommended ALPP regime for Moko and Freckle place the biosecurity of Australia's banana industry in the hands of Philippine banana growers who will be expected to honestly report the level of disease in their plantations. This should be questioned.

The IRA Team has not recommended imposing any risk management measures for Black Sigatoka despite concluding they were necessary in the First Report. The importation of bananas without any risk management measures will leave the Australian banana industry unprotected against the worst banana disease in the world. This should be questioned.

To protect Australian agricultural industries against the introduction of exotic mealybugs, the IRA team has recommended that Philippines packing station workers be required to diligently inspect and brush and sponge between the fingers of each cluster of bananas (estimated at **79,000,000** per year) to be exported to Australia. This should be questioned.

Based on the IRA Team's own scientific conclusions, there is a greater than **97%** chance that Moko, Freckle, mealybugs and Banana Bract Mosaic Virus will enter, establish and spread within Australia within **10 years** after the commencement of imports from the Philippines. This should be questioned.

In summary, the IRA Team's recommendation to allow the importation of bananas from the Philippines is based on a series of flawed assumptions of science which have lead them to grossly underestimate the risk of the pests and diseases of concern.

The combination of the following matters calls into question the credibility of this IRA process:

(a) the failure to make or maintain records of the IRA Team meetings (refer to section 3.1 of this submission);

(b) the back flip between the First and Second Reports – with no more science (refer to section 3.2 of this submission);

(c) the failure to seek advice from the Technical Working Groups on matters within their terms of reference (refer to section 3.3 of this submission);

(d) the use of the median (50^{th} percentile) measure of output distributions in the quantitative modelling in disregard of BA's own guidelines (refer to section 4.1 of this submission);

(e) the announced "discovery" of a modelling "error" which was identified by the Council within days of release of the Second Report (refer to section 4.3 of this submission);

(f) the profound change in the assessed consequences of Moko, without rationale (refer to section 5.2 of this submission);

(g) the profound change in assessed probability of entry, establishment and spread of Black Sigatoka, without rationale (refer to section 5.3 of this submission);

(h) the risk management measures proposed for mealy bugs which are preposterous (refer to section 5.5 of this submission); and

(i) the inconsistent assessment of the consequences of fruit fly in this IRA and in the IRA for mangosteen (refer to section 5.7 of this submission).

2 INTRODUCTION

The Council is the Australian banana industry's peak national agri-political organisation representing the interests of Australia's 2,320 banana growers.

The Council has actively participated as a stakeholder in representing the interests of its members in the import risk analysis process since it commenced in early 2000.

The Council submitted a comprehensive technical submission to BA in relation to the First Report.

This submission summarises a number of the key failures of process by BA and identifies a number of key deficiencies in risk methodology and science in the Second Report.

The Council is currently preparing a comprehensive technical submission to BA in relation to the Second Report.

3 FAILURES OF PROCESS

3.1 No Records of IRA Team Meetings

In evidence before the Committee on 8 March 2004, Ms Harwood and Dr McRae revealed that no records were maintained of the deliberations of the IRA Team, other than short summary records placed on the public file and draft versions of the First and Second Reports while being prepared.

The Council's review of the public file has not disclosed any short summary records of any of the meetings of the IRA Team, other than the record of one meeting between Philippines stakeholders, BA and the IRA Team which occurred on 10 and 11 April 2002.

The Council cannot understand why, despite the vastly different conclusions reached by the IRA Team between the First and Second Draft, no records were kept of the deliberative process of the IRA Team which would have allowed external scrutiny of that process.

The IRA process as described by Ms Harwood lacks the most basic standards of administrative care, accountability and transparency. The Council would have expected that the decision-making process for a decision which has such potentially serious consequences for the banana industry and regional economies, would have been conducted with the highest possible levels of administrative care, accountability and transparency. Evidence before the Committee demonstrates that that has not been the case.

The Committee should continue to press BA for an explanation as to why the IRA process was not conducted with the highest possible standards of administrative care, accountability and transparency.

3.2 No New Science

In evidence before the Committee on 8 March 2004, Ms Harwood sought to justify the back-flip between the First and Second Reports on the basis that "*[t]here are 130 additional scientific citations*" in the Second Report that were not in the First Report.

Of the additional citations in the Second Report, less than 25 are for publications that were not already in existence at the time of the release of the First Report.

The critical issue is that there has been no new scientific research since the release of the First Report which advances the understanding of the biology or epidemiology of any of the pests or diseases under consideration, other than one study by the Philippines Government which demonstrates that the IRA Team underestimated the period of symptomless infection of Moko in the First Report. There has been no new scientific research produced since the release of the First Report which provides any basis for the back-flip between the First and Second Reports.

Ms Harwood's reference to 130 additional citations is a ruse. It obscures the truth and misleads the Committee.

The Committee should ask BA for evidence of new science and, in its absence, seek an explanation as to why the IRA Team has changed so much of its initial assessment.

3.3 Technical Working Groups

In May 2001, the IRA Team established the following three technical working groups:

- the pathogens technical working group;
- the arthropods technical working group; and
- the horticulture, environment and operations technical working group.

The terms of reference of each of the technical working groups were specified in the Issues Paper published by BA on 2 May 2001 (refer to **Attachment 1**).

The terms of reference for the pathogens and arthropods technical working groups required them to assess the potential for relevant pests to enter, establish and spread in Australia and cause economic damage. The terms of reference of each of the technical working groups required them to consider relevant risk management measures.

In evidence before the Committee on 8 March 2004, Ms Harwood stated that "*their* [the technical working groups'] *job was to collate technical information pertaining to particular areas of quarantine substance*".

The job of the technical working groups was defined by their terms of reference. They were not given the limited function that Ms Harwood ascribed to them in her evidence before the Committee.

The technical working groups were never able to complete their terms of reference. Nor did BA permit them to reconvene and comment on the scientific conclusions that underpinned the Second Report, despite the significant changes in the recommendations from the First Report. At no stage were the technical working groups permitted to consider relevant risk management measures or potential risk management options despite that being an express part of their terms of reference.

The Committee should seek to understand why BA never permitted the technical working groups to complete their terms of reference and why those groups were never required to review the significant changes in recommendations between the First and Second Reports.

3.4 Failure to Respond to Submission

The Council submitted a comprehensive technical submission to BA in relation to the First Report. That submission identified the Council's serious concerns with many of the key scientific conclusions reached by the IRA Team in that report.

The IRA Team appears to have largely ignored the scientific and technical issues raised in the Council's submission. Further, the IRA Team has not specifically responded to any of the issues of substance raised in the Council's submission (or any of the other submissions made by any other stakeholders).

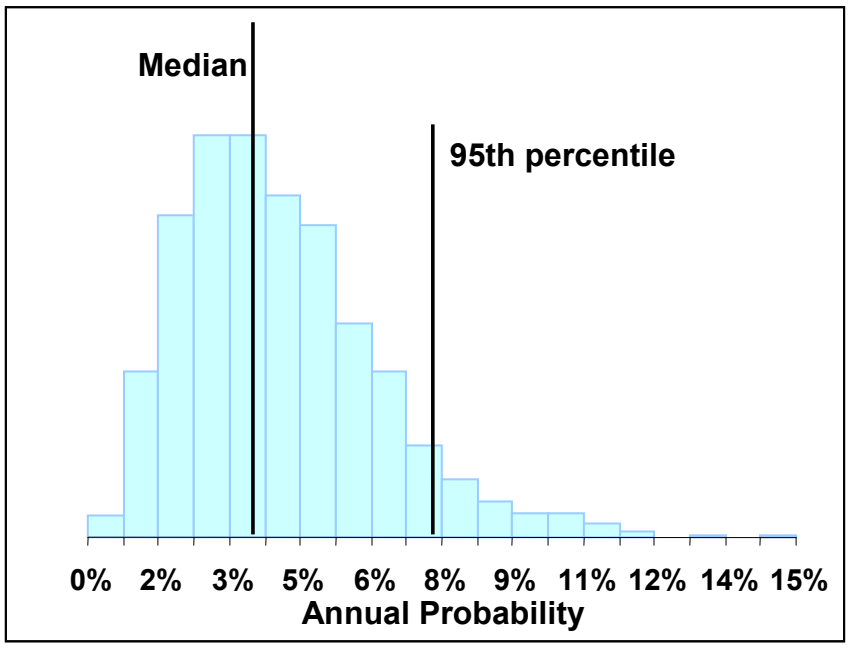
The Council considers that BA should, as a matter of process, be required to specifically respond to issues of substance raised in stakeholder submissions.

4 METHODOLOGY FOR RISK ASSESSMENT

4.1 Uncertainty and 95th Percentile

An important consideration in biological risk modelling is to take into account the level of uncertainty in data.

The annual probability of entry, establishment and spread for each of the pests in the IRA is calculated using a computer simulation model. The simulation model does not calculate a single value for the annual probability for each pest but rather, calculates the range of values within which the annual probability will fall. The results of the simulation model when shown graphically often appear as a skewed bell curve, such as in the example provided below:



One way to report the results of the simulation model for the annual probability is to report the central measure of the results, called the median (50th percentile). Fifty percent of the results of the simulation model are less than the median (50th percentile) and fifty percent of the results exceed the median (50th percentile). In the above graph, if the median (50th percentile) was reported, the annual probability would be about 4%. This is despite the fact that the results of the simulation model range between 0% and about 15%.

A more appropriate way to report the results of the simulation model is to report the 95th percentile. Ninety five percent of the results of the simulation model will be less than the 95th percentile. Reporting the 95th percentile is the more conservative and statistically appropriate method of reporting the results of the simulation model because it takes into account the uncertainty in the data inputted into the model. In the above graph, if the 95th percentile was reported, the annual probability would be about 8%.

The First Report (at page 58) states that the "*conservative (95th) percentile*" was reported in the First Report.

This was consistent with BA's *Guidelines for Import Risk Analysis* which state (on page 93) that '*[a]s a rule, it is recommended that the 95th percentile of an output distribution be*

reported. This conservative policy is based on a recognition that all models are (at least to some extent) imperfect representations of reality'.

Without any explanation, BA and the IRA Team have disregarded BA's own 'rule' and reported the median (50th percentile) in the Second Report rather than the 95th percentile.

The practical consequence of use of the median (50th percentile) instead of the conservative 95th percentile is that it can result in a lower annual probability of the entry, establishment and spread of a pest being used in the risk calculations in the IRA. This can result in the IRA Team calculating a lower risk for the pest.

By way of example, based on the IRA Team's assessment (which is disputed), the annual probability of fruit flies entering, establishing and spreading in Australia is about 4% if the median (50th percentile) is reported. This puts the annual probability within the 'very low' category and the risk within the 'very low' category. The annual probability is about 8% if the 95th percentile is reported. This puts the annual probability within the 'low' category and the risk within the 'low' category. A 'very low' risk meets Australia's appropriate level of protection (ALOP) while a 'low' risk does not.

In reporting the median (50th percentile) for the annual probability, the IRA Team has adopted a much less conservative and more risk tolerant approach to risk assessment.

The median (50th percentile) rather than the more conservative 95th percentile was also reported in the Final IRA Report for Pig Meat and the Revised IRA Report for Apples from New Zealand, both of which were published on the same day as the Second Report. It is implicit from this systemic change that BA directed each of the IRA Teams to report the median (50th percentile) rather than the more conservative 95th percentile.

The Committee should seek to understand why BA has directed the IRA Team to take a less conservative approach to import risk assessment that exposes the Australian banana industry and the Australian environment to unacceptable risks.

4.2 Unit for Assessment

The Second Report (at page 53) describes the unit for reporting likelihood and risk as being a period of 12 months. It states that the reason that 12 months was chosen was because "*it allowed for the estimation of seasonal effects, but did not require long-range predictions regarding trade practices, plant or commodity production or pest biology.*"

The Council considers that another appropriate unit for reporting likelihood and risk is a period of 10 years, and that both one year and 10 year should be considered. The use of a 10 year period satisfies BA's stated criteria as it also does not require long-range predictions regarding trade practices, plant or commodity production or pest biology.

The Council considers that the use of a 10 year period as a reporting unit provides a clearer indication of the risk of a pest over a reasonable longer term period.

If BA's risk assessment model is sufficiently robust to produce 12 month data upon which quarantine decision-making is based, it must be sufficiently robust to produce meaningful 10 year data.

The Committee should have regard to 10 year data as it provides a clearer indication of the risk of the relevant pests over a reasonable longer term period.

4.3 Council's Modelling

The Council has engaged expert statistical consultants to advise it in relation to risk methodology and risk modelling.

When the Second Report was released, despite many attempts, the Council's statistical consultants were unable to replicate BA's modelling (i.e., reproduce an identical model) for each of the pests and diseases assessed in the Second Report. As a result, within days of the release of the Second Report, the Council's statistical consultants became aware that there was a problem with the BA's modelling.

For that reason, the Council wrote to Mary Harwood on a number of occasions informing her that the Council's statistical consultants could not replicate BA's modelling and requested to be provided with a copy of the electronic spreadsheets which contained BA's modelling. Despite those requests, the Council was never provided with a copy of those spreadsheets.

On 17 March 2004, one month after the release of the Second Report, BA advised stakeholders of a "transcription error" in the electronic spreadsheets which contained its modelling.

It is now apparent why BA repeatedly ignored the Council's requests to provide it with a copy of BA's electronic spreadsheets.

The modelling undertaken by the Council's statistical consultants does not contain the error which affected BA's modelling and therefore, correctly calculates, based on the IRA Team's scientific conclusions (many of which are disputed) the annual probabilities and risks for each of pests and diseases assessed in the Second Report.

The results of the Council's modelling show the significant impact of the basic error which affected BA's modelling.

The Committee should seek to understand how such a basic error, which was identified by the Council's statistical consultants within days, was allowed to occur, particularly given the potentially enormous consequences of that error for the banana industry and regional economies.

To enable stakeholders to ensure that such an error does not occur again, the Council considers that BA should, in the future, be required to publicly release electronic spreadsheets containing its modelling for every IRA report that it releases.

Where the results of the Council's modelling are reported in this submission, those results are based on the median (50^{th} percentile) rather than the 95^{th} percentile unless otherwise stated. The Council has used the median (50^{th} percentile) to be consistent with BA, despite disagreeing with its use for the reasons specified above.

5 RISK ASSESSMENT FOR QUARANTINE PESTS

5.1 Background

The commercial Cavendish banana variety as well as non-commercial varieties are grown in the Philippines. Non-commercial bananas are a staple food source for many Filipinos, and are commonly grown in areas adjacent to where commercial Cavendish bananas are grown. Almost two thirds of all banana plants in the Philippines are non-commercial banana plants. They are poorly managed and as a consequence, provide a reservoir for diseases which can readily spread to commercial Cavendish banana plantations.

5.2 Moko

Introduction

Moko is a vascular wilt disease of banana plants caused by the bacterium *Ralstonia solanacearum* which kills infected plants. The disease affects the commercial Cavendish banana variety as well as non-commercial varieties. It is ubiquitous in the Philippines but not present in Australia.

Once a banana plant has been infected with the Moko bacterium, there is a period of time before the plant shows any visible symptoms of infection, called symptomless infection. If fruit is harvested from a plant during the period of symptomless infection, the Moko bacterium can be present in the fruit. Symptomless infected fruit cannot be visually distinguished from non-infected fruit and because the Moko bacterium is within the fruit, it cannot be killed by surface agents such as chlorine treatment. Symptomless infected fruit is the most likely (but not the only) pathway for the entry of the Moko bacterium into Australia in association with bananas.

First Report v Second Report

A comparison of the IRA Team's assessment of the unrestricted risk (i.e., without any risk management measures) of Moko is as follows:

	1st Draft	2nd Draft
Annual probability of entry, establishment and spread	High	Moderate
Consequence of entry, establishment and spread	Moderate	Low
Unrestricted risk of entry, establishment and spread	Moderate	Low

The IRA Team changed 10 out of the 31 total steps involved in the calculation of the unrestricted risk between the First and Second Reports.

Annual Probability of Entry, Establishment and Spread

The Council has very serious concerns about the scientific conclusions relied upon by the IRA Team in its assessment of the annual probability of entry, establishment and spread of Moko.

Failure to Use Adequate, Verifiable Incidence Data for Moko

The level of infection (called the incidence) of a pest in the Philippines is of critical importance to the calculation of the risk of a pest. It is a basic principle of import risk analysis that the highest-likely incidence of the pest should be considered. Despite specifically acknowledging that principle in the Second Report (at page 57), the IRA Team has not considered the highest-likely incidence of Moko in the IRA.

The Second Report relies upon an incidence of Moko of 1.3 cases/hectare/year based on incidence data provided by the Philippines Government in March 2002 (refer to **Attachment 2**). The Council believes that that data is inadequate and should not have been relied upon by the IRA Team because:

(a) the reporting period (4 years) is far too short to enable a proper assessment of the highest-likely incidence of a disease which shows substantial variations in incidence from year to year;

(b) the geographic area from which the data is drawn is unspecified and therefore, it is impossible for the IRA Team to ascertain whether it relates to the whole or part of the proposed export area or to the proposed export area at all;

(c) the data is average incidence data and therefore, it is certain that the incidence of Moko in some plantations will at times be substantially higher than the average incidence provided; and

(d) the data has not been supported by any survey data and therefore is unable to be audited and verified.

In April 2002, the IRA Team requested that the Philippines Government provide it with a retrospective survey of the incidence of Moko in commercial plantations over a 5-10 year period (refer to **Attachment 3**). Despite informing the IRA Team in May 2002 that the information was being compiled, the Philippines Government has never provided that information, and BA has never insisted that it do so.

In November 2003, the Council informed a member of the IRA Team that it had received information (on a non-attributable basis) that the incidence of Moko in one plantation in the Philippines managed by a multi-national company was 4.39 cases/hectare in the year 2002. This is more than 3 times the incidence relied upon in the Second Report.

Indeed, in the Second Report (at page 148), the IRA Team specifically notes that the incidence relied upon is not the highest-likely incidence but relies upon that data in any event.

The Committee should seek to understand why, given the crucial importance of the incidence of Moko to the IRA, BA never required the Philippines Government to provide it with adequate, verifiable incidence data, particularly as BA was notified that the incidence data provided grossly underestimates the incidence of Moko.

Errors in Science

The Council rejects a number of the key scientific conclusions reached by the IRA Team in relation to the unrestricted risk of Moko. In particular, the Council rejects the conclusions that:

(a) the time taken for symptoms of the disease to appear following infection will be 12 weeks;

(b) 50% of fruit in a symptomless infected bunch will be infected; and

(c) no more than 15% of infected plants will develop symptomless infected fruit.

The Council rejects those conclusions for the same reasons that they were rejected in the submission by Dr Mark Fegan from the CRC for Tropical Plant Protection (refer to **Attachment 4**).

Each of the above erroneous conclusions of science have caused the IRA Team to **profoundly** underestimate the risk of Moko.

Deficiencies in Risk Methodology

The Council's statistical consultants have identified a number of deficiencies in the statistical methodology used in the assessment of the annual probability of Moko. They have estimated that those deficiencies alone have the effect of producing an approximately **25** fold underestimation of the probability of the entry establishment and spread of Moko for a tonne of harvested bananas.

Consequence

The IRA Team has reduced its assessment of the consequences of Moko from **moderate** to **low** between the First and Second Reports. This change is based **entirely** on the IRA Team's reassessment of one criteria: the indirect impact of Moko on the economic viability of rural communities.

In the First Report (at page 144), the IRA Team considered the indirect impact of Moko on rural communities to be "*highly significant at the local and district level, significant regionally and of importance at the national level.*" (refer to **Attachment 5**)

By contrast, in the Second Report (at page 161), the IRA Team considered the indirect impact of Moko on regional communities to be "*minor at a district level.*"

The IRA Team has not provided an adequate explanation or relied upon any new scientific, technical or economic information to support its major reassessment of this critical issue.

The importance of this change in the Second Report cannot be overstated. The effect of changing the assessment of that criteria is to **profoundly** reduce the assessment of the risk of Moko.

The Committee should seek to understand why such an important aspect of the IRA was so significantly reduced in the absence of adequate explanation and any new information.

Unrestricted Risk

Based on the IRA Team's flawed assessment of the annual probability and consequences of the entry, establishment and spread of Moko, the unrestricted risk of Moko was reduced from **moderate** to **low** between the First and Second Reports.

Restricted Risk

Area of Low Pest Prevalence

In the First Report (at page 15), the IRA Team recommended "*that imports of bananas from the Philippines not be permitted because feasible* [risk management] *measures cannot be identified that would reduce the risk of entry, establishment and spread of Moko sufficiently to meet Australia's appropriate level of protection.*" In that Report (at pages 167 to 169), the IRA Team specified a number of reasons why it considered that it would be **impossible** to use an area freedom regime as a risk management measure for Moko (refer to **Attachment 6**). An area freedom regime would require export bananas to be sourced from plantations that are free of Moko.

In the Second Report (at page 272), the IRA Team recommend that "*bananas could safely be imported from areas of low pest prevalence*". An area of low pest prevalence regime is identical to an area freedom regime except that it would require export bananas to be sourced from plantations that have a low rather than no incidence of Moko. Consequently, the same reasons that were identified by the IRA Team in relation to the use of an area freedom regime make it **impossible** to use an area of low pest prevalence regime as a risk management measure for Moko.

The Committee should seek to understand why the reasons which it considered make the use of an area freedom regime **impossible** are not directly applicable to the use of an area of low pest prevalence regime.

Reliance on Inspection by Philippines

The area of low pest prevalence regime recommended for Moko requires weekly inspections of Philippine plantations. The Council has no confidence that the Philippines Government will strictly manage and enforce the inspection requirements, particularly as the Philippines does not have a culture of quarantine and graft and corruption is widespread in the Philippines.

The Council strongly rejects the use of any quarantine measure that relies upon monitoring and inspection by Philippines authorities.

Error with Model

Modelling undertaken by the Council's statistical consultants shows that based on the IRA Team's erroneous scientific conclusions (which are disputed), the use of an area of low pest prevalence regime will **not** reduce the risk of Moko from **low** to **very low** as stated in the Second Report. As a consequence, the risk of Moko will exceed Australia's appropriate level of protection (ALOP).

The Committee should seek to understand how BA made such a major error which, if not detected by the Council's statistical consultants, would have left the Australian banana industry and the Australian environment exposed to unacceptable risks.

Conclusion

The Council's expert statistical consultants have calculated, **based on the IRA Team's own scientific conclusions**, that even if the recommended area of low pest prevalence regime is imposed:

- Moko is expected to enter, establish and spread in Australia following **2 years** of imports of Philippine bananas[1]; and
- there is a **99% chance** that Moko will enter, establish and spread in Australia **within 10 years** after the importation of Philippine bananas commencing[2].

The Committee should seek to understand why BA considers that to be an acceptable level of risk.

5.3 Black Sigatoka

Introduction

Black Sigatoka is a leaf disease that is caused by the fungus *Mycosphaerella fijiensis* which significantly reduces banana production in infected plants. The disease affects the commercial Cavendish banana variety as well as non-commercial banana varieties and is ubiquitous in the Philippines where it is only managed by the use of very high levels of chemicals. It is the most devastating banana disease in the world.

A small outbreak of Black Sigatoka was found in the Tully Valley in April 2001. Against the odds, as a result of early detection, an intensive eradication program and favourable weather conditions (i.e., drought), the disease was successfully eradicated.

Small fragments of infected leaf trash trapped between banana fingers is the most likely (but not the only) pathway for the entry of Black Sigatoka into Australia in association with bananas.

First Report v Second Report

A comparison of the IRA Team's assessment of the unrestricted risk of Black Sigatoka is as follows:

	1st Draft	2nd Draft
Annual probability of entry, establishment and spread	High	Extremely low
Consequence of entry, establishment and spread	Low	Low
Unrestricted risk of entry, establishment and spread	Low	Negligible

[1] Assuming BA's estimate of imported tonnes per year and independence of shipments.

[2] Assuming BA's estimate of imported tonnes per year and independence of shipments.

The IRA Team changed 14 out of the 31 total steps involved in the calculation of the unrestricted risk between the First and Second Reports.

Annual Probability of Entry, Establishment and Spread

The IRA Team has reduced its assessment of the annual probability of entry, establishment and spread of Black Sigatoka from **high** (i.e., greater than 7 in 10 chances of occurring) to **extremely low** (i.e., between one in one million and one in one thousand chances of occurring) between the First and Second Reports. This is an incredible **1700** fold reduction[3] in the IRA Team's assessment of the annual probability between the First and Second Reports.

Importantly, the reassessment is not based on any advancement in the understanding of the biology or epidemiology of Black Sigatoka. This extreme reassessment in the absence of any new science calls into question the credibility of the IRA process for bananas.

This reassessment has a **profound** impact on the assessment of the risk of Black Sigatoka.

Use of Questionable Data

One of the IRA Team's key scientific assumptions is that infected leaf trash will not be trapped between banana fingers. In support of that argument, the IRA Team refers to a one page study prepared by NSW Agriculture. A senior plant health officer from NSW Agriculture who was responsible for instigating that study has informed the Council that the study lacked scientific rigor and questioned the appropriateness of the IRA Team's reliance upon it.

The IRA Team has also completely ignored interception data held by the Western Australia Department of Agriculture which records that 102 pieces of leaf trash were identified in banana cartons from New South Wales and Queensland, and that four of those pieces of leaf trash were infected with fungus, including one piece which was infected with the fungus yellow Sigatoka (a fungus closely related to Black Sigatoka). This data alone proves that the IRA Team's assumption is incorrect.

Use of Untested Data

Another of the IRA Team's key scientific assumptions is that treating bananas with a chlorine solution will be effective in killing any fungal spores associated with fruit. The IRA Team reached that conclusion in the absence of any direct evidence as to the efficacy of chlorine treatment for bananas under **commercial conditions** anywhere in the world. This is despite the Council having repeatedly expressed serious reservations about the efficacy of chlorine treatment under **commercial conditions**.

The Committee should seek to understand why the IRA Team has relied upon questionable and untested scientific assumptions in assessing the annual probability of the entry, establishment and spread of Black Sigatoka.

[3] Based on median values of the high and extremely low categories.

Consequence

In the Second Report (at page 191), the IRA Team considers the indirect impact of Black Sigatoka on rural communities to be "*minor at the district level.*" This is despite the significant job losses and serious flow-on effects for the regional economies which would result in the event that Black Sigatoka became established within commercial growing regions.

Unrestricted Risk

Based on the IRA Team's flawed assessment of the annual probability and consequences of the entry, establishment and spread of Black Sigatoka, the unrestricted risk of Black Sigatoka was reduced from **low** to **negligible** between the First and Second Reports.

Such a dramatic reassessment in the absence of any new science calls into question the scientific credibility of the IRA process.

Restricted Risk

In the First Report (at page 251), the IRA Team considered that an area freedom regime would be necessary to manage the risk of Black Sigatoka.

In the Second Report (at page 192), because the IRA Team assessed the unrestricted risk of Black Sigatoka as not exceeding Australia's appropriate level of protection, the IRA Team did not recommend any risk management measures.

Conclusion

The IRA Team's conclusion that no risk management measures are necessary for Black Sigatoka is based on a series of erroneous scientific conclusions and leaves the Australian banana industry completely unprotected against the most devastating banana disease in the world.

The Committee should seek to understand why that is acceptable.

5.4 Freckle

Introduction

Freckle is a leaf and fruit-spotting disease caused by the fungus *Guignardia musea* which damages fruit appearance, making it unmarketable. The disease affects the commercial Cavendish banana variety as well as non-commercial banana varieties. It is widely distributed in the Philippines but not present in Australia.

Once fruit has been infected with the Freckle fungus, there is a period of time before the fruit shows any visible symptoms of infection, called symptomless infection. Symptomless infected fruit is the most likely (but not the only) pathway for the entry of the Freckle fungus into Australia.

First Report v Second Report

A comparison of the IRA Team's assessment of the unrestricted risk of Freckle is as follows:

	1st Draft	2nd Draft
Annual probability of entry, establishment and spread	High	High
Consequence of entry, establishment and spread	Low	Low
Unrestricted risk of entry, establishment and spread	Low	Low

The IRA Team changed 10 out of the 31 total steps involved in the calculation of the unrestricted risk between the First and Second Reports.

Restricted Risk

In the First Report (at page 248), the IRA Team recommended imposing an area freedom regime to manage the risks of Freckl. In the Second Report (at page 290), the IRA Team recommended imposing an area of low pest prevalence regime to manage the risks of Freckle. The same considerations which make the use of an area of low pest prevalence regime inappropriate for Moko apply to Freckle.

Modelling undertaken by the Council's expert statistical consultants shows that even based on the IRA Team's own erroneous conclusions, an area of low pest prevalence regime will not reduce the restricted risk of Freckle from **low** (based on the 95th percentile) to **very low**, as stated in the Second Report.

Conclusion

The Council's statistical consultants have calculated, **based on the IRA Team's own scientific conclusions**, that even if the recommended area of low pest prevalence regime is imposed:

- Freckle is expected to enter, establish and spread in Australia following **2.5 years** of imports of Philippine bananas[4]; and
- there is a **97% chance** that Freckle will enter, establish and spread in Australia **within 10 years** after the importation of Philippine bananas commencing[5].

The Committee should seek to understand why BA considers that to be an acceptable level of risk.

5.5 Mealybugs

Introduction

Mealybugs are an insect pest that feed by sucking on plants. They can damage plants directly, and can cause indirect damage by transmitting plant viruses. Mealybugs infest a wide range of important agricultural crops other than bananas including citrus, pineapple,

[4] Assuming BA's estimate of imported tonnes per year and independence of shipments.

[5] Assuming BA's estimate of imported tonnes per year and independence of shipments.

cotton and maize. The species of mealybugs of concern (*D. neobrevipes* and *P. jackbeardsleyi*) are ubiquitous in the Philippines but are not present in Australia.

Mealybugs are small insects that hide in the safe crevices between banana fingers, where they are protected from inspection and washing and brushing. Immature mealybugs called 'crawlers' are microscopic and would evade any inspection regime.

This is demonstrated by the fact that live mealybugs were detected in 36 of the 82 consignments of Philippines bananas imported to New Zealand between 11 January 2001 and 21 March 2002 despite those consignments having already been inspected for mealybugs in the Philippines prior to export.

First Report v Second Report

A comparison of the IRA Team's assessment of the unrestricted risk of mealybugs is as follows:

	1st Draft	2nd Draft
Annual probability of entry, establishment and spread	High	High
Consequence of entry, establishment and spread	Moderate	Low
Unrestricted risk of entry, establishment and spread	Moderate	Low

The IRA Team changed 11 out of the 31 total steps involved in the calculation of the unrestricted risk between the First and Second Reports.

Consequence

The IRA Team's assessment of the consequences of mealybugs was reduced from **moderate** to **low** between the First and Second Reports, without any adequate explanation or new science.

Unrestricted Risk

Based on the IRA Team's flawed assessment of the annual probability and consequences of the entry, establishment and spread of mealybugs, the unrestricted risk of mealybugs was reduced from **moderate** to **low** between the First and Second Reports.

Restricted Risk

Reliance on Inspection and Brushing/Sponging

The IRA Team has recommended a combination of targeted inspection and targeted sponging and brushing as risk management measures for mealybugs.

Targeted inspection would involve Philippine packing station workers specifically inspecting the spaces between banana fingers for mealybugs. In the First Report (at page 253), the IRA Team considered it **unlikely** that packing station workers would be able to detect mealybugs and specifically stated that it could not identify any measure (such as targeted inspection) that could increase that likelihood of detection (refer to **Attachment**

8). By contrast, in the Second Report (at page 291), the IRA Team considered it **highly likely** that packing station staff would be able to identify mealybugs by targeted inspections. No adequate explanation or new information has been provided to justify this significant change of scientific opinion.

Targeted sponging and brushing would involve Philippine packing station workers specifically sponging and brushing the spaces between banana fingers for mealybugs. In the Second Report (at page 292), the IRA Team stated that they consider it **highly likely** that mealybugs would be removed by targeted sponging and brushing.

The proposed risk management measures for mealybugs are laughable. Even assuming that those measures would be effective (which they wouldn't), does the IRA Team really expect that Philippine packing station workers will diligently inspect and sponge and brush between the fingers of every single cluster of bananas (estimated at **79,000,000** per year) which will be packed for export to Australia?

Insecticidal Treatment

In the First Report (at page 254), the IRA Team considered that insecticidal treatment could be used to kill mealybugs present on bananas, and therefore recommended the use of this treatment as the only risk management measure for mealybugs (refer to **Attachment 8**). The IRA Team considered that this would reduce the risk of mealybugs to **negligible**. The IRA Team specifically considered fumigation as one possible insecticidal treatment.

By contrast, in the Second Report (at page 292), the IRA Team considered that the use of an insecticidal treatment would **not** reduce the risk of mealybugs from **low**. The IRA Team considered insecticidal dips and sprays but did not consider fumigation as a possible insecticidal treatment. No adequate explanation or new information has been provided to justify this significant change of scientific opinion.

The Committee should seek to understand how the IRA Team's assessment of the efficacy of insecticidal treatment has changed so significantly without adequate explanation or new information.

Error in BA's Modelling

Modelling undertaken by the Council's statistical consultants shows that based on the IRA Team's erroneous scientific conclusions (which are disputed), the use of targeted inspection and sponging and brushing will not reduce the risk of mealybugs from **low** to **very low** as stated in the Second Report. As a consequence, the risk of mealybugs will exceed Australia's appropriate level of protection (ALOP).

The Committee should seek to understand how BA made such a major error which, if not detected by the Council's statistical consultants, would have left the Australian banana industry and the Australian environment exposed to unacceptable risks.

Conclusion

The Council's statistical consultants have calculated, **based on the IRA Team's own scientific conclusions**, that even if the recommended targeted inspection and sponging and brushing regime is imposed:

- mealybugs are expected to enter, establish and spread in Australia following **1.5 years** of imports of Philippine bananas[6]; and

- there is a **97% chance** that mealybugs will enter, establish and spread in Australia **within 10 years** after the importation of Philippine bananas commencing[7].

The Committee should seek to understand why BA considers that to be an acceptable level of risk.

5.6 Banana Bract Mosaic Virus

Introduction

Banana Bract Mosaic Virus (BBrMV) is a virus which infects all varieties of banana plants. It causes a reduction in the health of infected plants and results in production losses in the commercial Cavendish variety. It is widespread in the Philippines but not present in Australia.

First Report v Second Report

A comparison of the IRA Team's assessment of the unrestricted risk of BBrMV is as follows:

	1st Draft	2nd Draft
Annual probability of entry, establishment and spread	Extremely low	Low
Consequence of entry, establishment and spread	Very low	Low
Unrestricted risk of entry, establishment and spread	Negligible	Very low

Annual Probability

Modelling undertaken by the Council's statistical consultants shows that based on the IRA Team's erroneous scientific conclusions (which are disputed), the annual probability of entry, establishment and spread of BBrMV will be **moderate**, not **low** as stated in the Second Report.

Criticism by Professor Dale

The assessment of the annual probability of entry, establishment and spread of BBrMV in the Second Report (at page 210 to 212) is based in part on the conclusion that BBrMV "*is rarely seen in commercial Cavendish plantations in the Philippines*".

Professor James Dale, a leading researcher in BBrMV from QUT has severely criticised that conclusion (refer to **Attachment 9**). In a recent press release, Professor Dale stated:

[6] Assuming BA's estimate of imported tonnes per year and independence of shipments.

[7] Assuming BA's estimate of imported tonnes per year and independence of shipments.

> "*… This virus was very widespread in the Philippines when we were collecting there 10 years ago. It is spread rapidly by aphids and eradication of similar viruses from perennial crops such as bananas is near impossible. …*
>
> *All of the previous information says this virus was widespread in the Philippines in Mindanao Province and in commercial plantations. The absence of any new independent information ought to elicit a conservative approach from Biosecurity Australia. …*
>
> *It is difficult to identify symptoms of the BBrMV and there is every likelihood of harvesting Philippines bananas that are harbouring the virus without showing symptoms. …*
>
> *They are asking us to make a quantum leap in the incidence rate from widespread to very low. This is a huge leap of faith, obviously lacking in scientific credibility when 10 years ago the Banana Bract Mosaic Virus was in epidemic proportions in the Philippines.*"

Having regard to Professor Dale's expert opinion, the annual probability of BBrMV should be assessed as **high**, not **low** as stated in the Second Report.

Unrestricted Risk

The unrestricted risk of BBrMV was increased from **negligible** to **very low** between the First and Second Reports.

IRA Team's Assessment of Unrestricted Risk

Modelling undertaken by the Council's statistical consultants shows that even based on the IRA Team's own flawed scientific conclusions (which are disputed), the risk of BBrMV will be **low**, not **very low** as stated in the Second Report.

Professor Dale's Assessment of Unrestricted Risk

Additional modelling undertaken by the Council's statistical consultants shows that if the annual probability of BBrMV is assessed as **high** rather than **low** as suggested by Professor Dale (discussed above), the risk of BBrMV will be **low**, not **very low** as stated in the Second Report.

In either case, the risk of BBrMV exceeds Australia's appropriate level of protection (ALOP).

Conclusions

The Council's statistical consultants have calculated, **based on the IRA Team's own scientific conclusions**, that:

- BBrMV is expected to enter, establish and spread in Australia following **1.8 years** of imports of Philippine bananas[8]; and

[8] Assuming BA's estimate of imported tonnes per year and independence of shipments.

- there is a **99% chance** that BBrMV will enter, establish and spread in Australia **within 10 years** after the importation of Philippine bananas commencing[9].

The Committee should seek to understand why BA considers that to be an acceptable level of risk.

5.7 Fruit Flies

Introduction

Fruit flies lay eggs under the surface of immature fruit and are a major global quarantine pest. Two species of fruit fly are considered in the IRA which are not present in Australia. One of those species, the Philippines Fruit Fly lays its eggs in a wide range of fruits including mangos, paw paws, guava and mandarins.

As fruit flies will be able to lay their eggs in damaged mature hard green bananas, this is a likely (but not the only) pathway for the entry of Philippines fruit flies into Australia.

In addition, Professor Richard Drew of Griffith University, who is a recognised world expert in the taxonomy, biology and ecology of South East Asian fruit flies, has informed the Council's consultant entomologist that he considers that the Philippines Fruit Fly is likely to have the ability to sting and lay its eggs under the peel of mature hard green undamaged bananas. This would be a major pathway for the entry of this species into Australia which has been largely ignored by the IRA Team. This is a major deficiency in the Second Report.

The Committee should seek to understand why BA never consulted Professor Richard Drew in relation to the IRA despite his unquestionable expertise, and why this likely major pathway has been ignored at the risk of Australia's fruit and vegetable industries.

First Report v Second Report

A comparison of the IRA Team's assessment of the unrestricted risk of fruit flies is as follows:

	1st Draft	2nd Draft
Annual probability of entry, establishment and spread	Very low	Very low
Consequence of entry, establishment and spread	Moderate	Moderate
Unrestricted risk of entry, establishment and spread	Very low	Very low

[9] Assuming BA's estimate of imported tonnes per year and independence of shipments.

Annual Probability

The annual probability of the entry, establishment and spread of fruit flies was assessed as **very low** in both the First and Second Reports.

The IRA Team's Assessment of Annual Probability

Modelling undertaken by the Council's statistical consultants shows that even based on the IRA Team's own flawed scientific conclusions (which are disputed), the annual probability of fruit flies is **low** (based on the 95th percentile), not **very low** as stated in the Second Report.

The Council's Assessment of Annual Probability

The Council has been advised by its statistical consultants that if a fruit fly lays eggs on one banana within a tonne of export bananas on more than one occasion in the Philippines per year, the likelihood of 'Imp2' (one of the 24 steps in the calculation of the annual probability) must for statistical reasons be **extremely low**, not **negligible** as stated in the Second Report. The Council's consultant entomologist considers that it is beyond doubt that this will occur. The effect of this one change is that the annual probability will be **high**, not **very low** as stated in the Second Report.

Consequences

BA released a Final IRA Report in relation to the importation of mangosteen (a tropical fruit) from Thailand in February 2004 (the same month that the Second Report was released). In the mangosteen report, BA considered the consequences of three species of fruit flies (refer to **Attachment 10**). While those fruit flies are not the same as the species of fruit flies considered in the Second Report, the assessment of the consequences of fruit flies in both the First and Second Reports and the mangosteen report involved an assessment of the consequence of fruit flies generally (i.e., it was not species specific).

In both the First and Second Reports and the mangosteen report, the assessment of consequences involved an assessment of a number of specified criteria, each of which is given a rating between A to F, where A is the least sever and F is the most server. The ratings for each of the criteria are combined together using rules developed by BA to give an overall consequence. A comparison of the assessment of consequence in the First and Second Reports and the mangosteen report is provided below:

Consequence Assessment Criteria	1st Report	2nd Report	Mangosteen
Direct Consequences			
Animal or plant life or health	A	A	D
Human life or health	A	A	-
Other aspect of environment	A	A	A
Indirect Consequences			
Eradication, control, etc	A	B	E
Domestic trade or industry effects	C	C	D
International trade effects	C	D	D
Indirect effects on environment	A	A	A
Overall consequences	**Moderate**	**Moderate**	**High**

The overall consequence of fruit flies was assessed as **moderate** in both the First and Second Reports and **high** in the mangosteen report, despite the fact that in each case, the assessment was of the consequences of fruit flies generally.

The Council considers that the assessment of the consequences of fruit flies provides in the mangosteen report more appropriately reflects the risk of fruit flies to Australia.

The Committee should seek to understand why the IRA Team's assessment of the consequences of fruit flies in the Second Report is so inconsistent with BA's assessment of the consequences of fruit flies in the mangosteen report.

Unrestricted Risk

The unrestricted risk of fruit flies was assessed as **very low** in both the First and Second Reports.

The IRA Team's Assessment of Unrestricted Risk

Modelling undertaken by the Council's statistical consultants shows that even based on the IRA Team's own flawed scientific conclusions (which are disputed), the restricted risk of fruit flies will be **low** (based on the 95th percentile), not **very low** as stated in the Second Report. If the consequence is assessed as **high** consistent with the assessment in the mangosteen report, the unrestricted risk would be **moderate**.

The Council's Assessment of Unrestricted Risk

Modelling undertaken by the Council's statistical consultants shows that if the annual probability of the entry, establishment and spread of fruit flies is assessed as **high** rather than **very low** for the statistical reasons discussed above, the unrestricted risk of fruit flies will be **moderate**, not **very low** as stated in the Second Report. If the consequence is

assessed as **high** consistent with the assessment in the mangosteen report, the unrestricted risk would be **high**.

In either case, the unrestricted risk of fruit flies exceed Australia's appropriate level of protection (ALOP).

Restricted Risk

As the unrestricted risk of fruit flies exceeds Australia's appropriate level of protection (ALOP), it will be necessary for the IRA Team to recommend risk management measures for fruit flies. This has not occurred.

Conclusion

The IRA Team's conclusion that no risk management measures are necessary for fruit flies is based on a series of erroneous scientific conclusions and leaves the Australian fruit and vegetable industries completely unprotected against the fruit flies under consideration.

The Committee should seek to understand why that is acceptable.