



Department of Agriculture and Food, Western Australia

Submission:

**Draft report for the non-regulated analysis of existing policy
for fresh strawberry fruit from the Republic of Korea**

24 October 2016

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Introduction

Western Australia is naturally free from a large number of pests and diseases that are present in other parts of Australia and the world. Western Australia's geographical isolation in conjunction with a robust plant biosecurity system—including border quarantine checkpoints, inter and intrastate regulatory controls, industry and public awareness campaigns and surveillance programs—maintain this status.

Plants and plant products imported into Western Australia are subjected to various import conditions. Some are general import conditions, whilst other conditions are for specific commodities or pests. Underpinning these generic and specific import conditions is the legislative requirement that potential carriers are presented to an inspector immediately upon entry into Western Australia for inspection at prescribed inspection points. Detection of any quarantine pests during inspection leads to necessary remedial action.

Ongoing surveillance systems are in operation within Western Australia. Operating alongside targeted surveillance is an effective passive surveillance program. Growers and the wider community are made aware of biosecurity issues resulting in suspect samples regularly submitted by the public for identification via the AGWEST Plant Laboratories or Pest and Disease Information Service. Industry awareness is achieved via programs such as HortGuard, which includes the development of industry biosecurity plans.

In maintaining Western Australia's freedom from pests and diseases, Department of Agriculture and Food, Western Australia continues to take a strong interest in all import risk analyses and related documents and decisions made by the Australian Department of Agriculture and Water Resources.



General Comments

Consultation

Comment 1: The Department of Agriculture and Food, Western Australia (DAFWA) would like to thank the Australian Department of Agriculture and Water Resources (DAWR) for the opportunity of advanced consideration of the draft pest categorisation table via the Plant Health Committee.

However, whilst DAWR the department provided our Department the opportunity for advanced consideration of regional pests—the majority of comments made to any scientific or technical issues, or instances where the methodology appear not to align with ISPM 11—were not adequately addressed in the draft report.

DAFWAs submissions to recent draft reports—mangoes from Indonesia, Thailand and Vietnam and table grapes from India (Department of Agriculture 2015b; 2015a)—had also requested the opportunity to review and provide comments to changes prior to release of the final reports.

Whilst this did not occur, DAFWA notes that the recommendation for further consultation was addressed by DAWR in Appendix B of the finals:

'The Australian Government Department of Agriculture and Water Resources has conducted this non-regulated analysis of existing policy consistent with the Import Risk Analysis Handbook 2011. Please note that from 16 June 2016, the Import Risk Analysis Handbook 2011 will be replaced by the Biosecurity Import Risk Analysis Guidelines 2015. For further information on the new guidelines please refer to the department's website. The department is willing to consider new information and modify import conditions if warranted.'

DAFWA acknowledges that DAWR does provide for input for non-regulated risk analyses, but there is no formal agreement or requirement for the department to consult with stakeholders for non-regulated risk analyses in the BIRA Guidelines (Department of Agriculture and Water Resources 2016a).

The current process does not allow for the satisfactory resolution of concerns raised by DAFWA that are not addressed in the final policy.

Comment 1: DAFWA has made efforts in recent submissions to draft pest categorisations for regional pests, to highlight issues and provide additional opportunities for resolution, prior the release of the draft report. However, this has not occurred in most cases, with minimal amendments made between the draft pest categorisation and draft report for strawberries (Department of Agriculture and Water Resources 2016b).

Examples of this are provided in the pathology and entomology comments regarding the pest categorisation in this document.

Recommendation 1: Further engagement with DAFWA is requested with the aim to satisfactorily resolve any significant technical and methodology concerns prior to the release of any final report.



Recommendation 2: Stakeholders should be provided the opportunity to review and provide comments on any changes to the draft document prior to the release of the final policy review.

Methodology

Comment 2: Comments provided by DAFWA in relation to the methodology employed in the pest categorisation process in recent draft reports —mangoes from Indonesia, Thailand and Vietnam and table grapes from India (Department of Agriculture 2015b; 2015a)—were not adequately addressed. DAFWA notes that concerns in regards to methodology were addressed in Appendix B of the final documents by:

*'The Australian Government Department of Agriculture and Water Resources has conducted the pest categorisation process in accordance with ISPM 11. The evidence considered does not support a **strong pathway association** for all pests considered. The department considers there is **insufficient information** to justify a full pest risk assessment for these organisms'*
(Department of Agriculture and Water Resources 2015).

*'The Australian Government Department of Agriculture and Water Resources has conducted the pest categorisation process in accordance with ISPM 11. The evidence considered does not support a **strong pathway association** for all pests considered. For some of the pests, for example for pathogens which are seed transmitted in grapes and have no other means of establishment, the evidence considered (including full assessments for similar pathogens that are seed transmitted) does not support a potential for the pests to establish and spread. The department considers that the **available evidence** does not justify a full pest risk assessment for these organisms'* (Department of Agriculture and Water Resources 2016c).

The definition of what comprises a 'strong pathway association' is not included in the methodology of these reports and is not stipulated in ISPM 11 (2016).

Where there is insufficient or unavailable information, ISPM 11 (2016) stipulates that at the conclusion of the pest categorisation—in the absence of sufficient information—the uncertainties should be identified and the PRA process should continue.

Comment 3: There are numerous examples in the draft document, where evidence provided in the pest categorisations specifies that the organism has a potential pathway association, however, justifications are provided and the pest categorisation is terminated at potential to be on the pathway.

In DAFWA's submission to the draft pest categorisation, it was demonstrated where the reasoning provided did not justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report (Figure 1).

▪ **2.2.1 → Pest categorisation**

Pest categorisation identifies which of the pests with the potential to be on the commodity are quarantine pests for Australia and require pest risk assessment. A 'quarantine pest' is a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (FAO 2015a).

The pests identified in Stage 1 were categorised using the following primary elements to identify the quarantine pests for the commodity being assessed:

- → 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.

The results of pest categorisation are set out in Appendix A. The quarantine pests identified during categorisation were carried forward for pest risk assessment and are listed in Tables 4.1 to 4.4.

Figure 1: Pest categorisation method as outlined on p. 6 of the draft report (Department of Agriculture and Water Resources 2016b).

The justifications provided for terminating the pest categorisation at the pathway association step appear to be factors requiring consideration when assessing the probability of entry component of a pest risk assessment process. For example, the assessment of pest management, cultural and commercial procedures applied at the place of origin are factors to be considered in the probability of importation (Figure 2).

Factors to be considered in the probability of importation may include:

- → distribution and incidence of the pest in the source area
- → occurrence of the pest in a life stage that would be associated with the commodity
- → mode of trade (for example, bulk, packed)
- → volume and frequency of movement of the commodity along each pathway
- → seasonal timing of imports
- → pest management, cultural and commercial procedures applied at the place of origin
- → speed of transport and conditions of storage compared with the duration of the lifecycle of the pest
- → vulnerability of the life stages of the pest during transport or storage
- → incidence of the pest likely to be associated with a consignment
- → commercial procedures (for example, refrigeration) applied to consignments during transport and storage in the country of origin, and during transport to Australia.

Figure 2: Summary of factors considered in the probability of importation as outlined on p. 7 of the draft report (Department of Agriculture and Water Resources 2016b)

Recommendation 1: DAFWA requests that a justification for the use of and provision of a definition of what a **strong pathway association** comprises in the methodology.

Recommendation 2: As per ISPM 11 (2016), in the absence of sufficient information—the uncertainties should be identified and the PRA process should continue.



Recommendation 3: Where the evidence provided suggests that an organism has a potential pathway association, to ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway is suggested to be amended to 'Yes'. The organism is requested to be considered further in the pest categorisation process to establish its quarantine pest status for the pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.



Pathology comments regarding the pest categorisation

Little leaf

Comment 1: A potential pathway association for Little leaf has been justified as:

*'No. In infected plants, Phytoplasmas are obligate parasites occupying in the phloem tissue (Lee, Davis & Gundersen-Rindal 2000). **Therefore they can be present in all plant parts containing phloem tissue, including the strawberry fruit and seeds in it.** The current evidence is that seed to seedling transmission is unlikely (Dickinson, Tuffen & Hodgetts 2013). Transmission from small amounts of the fruit tissue going into waste to new hosts is also unlikely.'*

The evidence suggests that Little leaf has a potential pathway association. The justification provided are factors requiring consideration when assessing the probability of distribution, particularly the assessment of transfer from seed to seedling and transmission from fruit tissue to new hosts as outlined in page 7 of the draft report.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Recommendation 1: The draft report provides evidence of a potential pathway association for Little leaf to be present on the pathway. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for Little leaf is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that Little leaf be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Tomato ringspot virus

Comment 1: A potential pathway association for Tomato ringspot virus has been justified as:

*'No. **No records of Tomato ringspot virus have been found on strawberries in Korea, only on lilies** (Kim & Koo 2009; Lee et al. 1996; QIA 2016). Supporting this, Korea currently tests strawberry seed coming into the country for this virus (QIA 2016). The department will continue to monitor relevant information relating to this pest, including its status in Korea. The department will re-assess it if new information warrants it.'*

The justification provided appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of the distribution and incidence of the pest in the source are, and cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report. This would be consistent with the approach taken for Brown rot (*Monilinia fructigena* or *Monilia polystroma*) which progresses to a full pest risk assessment.

*'However, **no records have been found of Monilinia fructigena or Monilia polystroma on strawberries in Korea.***

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential



presence on the pathway and appear to be inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Comment 3: In addition, Tomato ringpost virus has been reported to be seedborne in strawberry (Stace-Smith 1984). Therefore, Tomato ringpost virus has the potential to be associated with the strawberry fruit pathway.

Recommendation 1: The draft report provides evidence of a potential pathway association for Tomato ringspot virus to be present on the pathway. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for Tomato ringspot virus is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that Tomato ringpost virus be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Phyllosticta fragariicola Roberge ex Desm.

Comment 1: Following comments made by DAFWA in the consideration of the draft pest categorisation table, it is noted that an out of session request for pest verification of *Phyllosticta fragariicola* has been circulated to the state departments via the Plant Health Committee. Although the assessment of presence within Australia has not changed in the draft report, it is anticipated that the final report will contain an updated assessment of presence within Australia, and if found to be absent, that *Phyllosticta fragariicola* will be considered further in the pest categorisation process to establish its quarantine pest status for this pathway.

Comment 2: *Phyllosticta fragariicola* is reported to cause a leaf spot (Bhardwaj & Sharma 1999) and therefore has the potential to be on the strawberry fruit pathway in association with calyx.

Recommendation 1: If assessed as absent from Australia, DAFWA requests that *Phyllosticta fragariicola* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Septoria fragariae Desm.1842

Comment 1: Following comments made by DAFWA in the consideration of the draft pest categorisation table, it is noted that an out of session request for pest verification of *Septoria fragariae* has been circulated to the state departments via the Plant Health Committee. Although the assessment of presence within Australia has not changed in the draft report, it is anticipated that the final report will contain an updated assessment of presence within Australia, and if found to be absent, that *Septoria fragariae* will be considered further in the pest categorisation process to establish its quarantine pest status for this pathway.

Comment 2: *Septoria fragariae* is a pathogen of strawberry fruit, causing septoria hard rot and leaf spot (Garrido et al. 2011) and is noted to cause disfigurement and rot of fruit in Maas (1998). Therefore, *Septoria fragariae* has the potential to be associated with the strawberry fruit pathway.

Recommendation 1: If assessed as absent from Australia, DAFWA requests that *Septoria fragariae* be considered further in the pest categorisation process to establish its



quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Strawberry mottle virus (SMoV) and Strawberry pallidosis associated virus (SPaV)

Comment 1: The treatment of viruses affecting strawberries is inconsistent in the pest categorisation table in Appendix A of the draft report. Specifically, Strawberry mottle virus, Strawberry pallidosis associated virus and Strawberry vein banding virus are all assessed as present within Australia based on records in specific Australian states. No records for presence of these viruses have been listed for Western Australia and a search of the scientific literature failed to locate any records of these viruses in Western Australia. However, only Strawberry vein banding virus is considered further in the pest categorisation process.

Comment 2: Strawberry mottle virus can be spread with propagative material such as runners and transmitted in a semi-persistent manner by aphids belonging to the genus *Chaetosiphon* and *Aphis gossypii* (Maas 1998). Viruses generally infect plants systemically suggesting the virus has potential to be present in the calyx of the fruit.

Comment 3: Transmission of Strawberry pallidosis associated virus is via whiteflies; seed and pollen transmission have not been demonstrated (Tzanetakis et al. 2006). Viruses generally infect plants systemically suggesting the virus has potential to be present in the calyx of the fruit.

Recommendation 1: Based on the treatment of Strawberry vein banding virus and the absence of records of Strawberry mottle virus and Strawberry pallidosis associated virus in Western Australia. DAFWA requests that these viruses be considered further in the pest categorisation process to establish their quarantine pest status; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.



Entomology comments regarding the pest categorisation

Acusta despecta Sowerby 1839

Comment 1: A potential pathway association for *Acusta despecta* has been justified as:

'No. Although A. despecta is known to feed on strawberry leaves, stems and fruit in Korea (QIA 2015b), eggs of all Stylummatophora are laid in soil crevices or in leaf litter (Clemente et al. 2008; Faberi et al. 2006), and larvae and adults are likely to be noticed and removed during harvesting and packing.'

The evidence provided suggests that *A. despecta* has a potential pathway association. Furthermore, the information relating to harvesting and packing appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate a potential pathway association and appear inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Recommendation 1: The draft report appears to provide evidence of a potential pathway association for *A. despecta*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential pathway association for *A. despecta* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Acusta despecta* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Ancylis comptana Frölich 1828

Comment 1: A potential pathway association for *Ancylis comptana* has been justified as:

'No. Larvae feed on upper surface of leaves. They can cause indirect damage to mature fruit via attacking buds, leading to 'catfacing' in mature fruit, (Marshall 1954). Therefore, it is unlikely that infested fruit will be picked and packed for export. There is also a record of A. comptana rolling the calyx against the fruit and feeding underneath, causing the fruit to be unsightly and be rejected during harvest (North Carolina State University 2014).'

The justification provided suggests that *A. comptana* has a potential pathway association. Furthermore, the information relating to harvesting and packing appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

In addition, damage caused by early instar larvae may not be detected during harvest. The cryptic leaf-rolling habit under the calyx would also be difficult to detect.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate a potential



pathway association and appears inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Comment 3: *Ancylis comptana* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: The draft report appears to provide evidence of a potential pathway association for *A. comptana*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *A. comptana* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Ancylis comptana* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Archips breviplicanus Walsingham 1900

Comment 1: A potential pathway association for *Archips breviplicanus* has been justified as:

'No. Larvae feed on lower surface of leaves, buds and the surface of fruit in contact with leaves. They also spin leaves irregularly (Meijerman & Ulenberg 2000). Therefore, they are unlikely to be found on strawberry fruit and damaged fruit would be noticed and not picked during harvest.'

DAFWA's submission to the pest categorisation suggested that if larvae are known to feed on the surface of fruit in contact with leaves (Meijerman & Ulenberg 2000) then the strawberry calyx would be suitable. The evidence suggests that *A. breviplicanus* has a potential pathway association. Furthermore, the information relating to harvesting appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

In addition, damage caused by early instar larvae may not be detected during harvest.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Comment 3: *Archips breviplicanus* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: The draft report appears to provide evidence of a potential pathway association for *A. breviplicanus*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *A. breviplicanus* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Archips breviplicanus* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Archips fuscocupreanus Walsingham 1900



Comment 1: A potential pathway association for *Archips fuscocupreanus* has been justified as:

*'No. Young larvae feed on developing leaves. Older larvae eat flowers and **may graze on developing fruit** (CABI 2015a). Eggs are laid on trunks and limbs of trees (Gilligan & Epstein 2014). Not a pest of mature fruit (CABI 2015a).'*

DAFWA's submission to the draft pest categorisation provided additional evidence that mature larvae of *Archips fuscocupreanus* feed preferably on fruit (Meijerman & Ulenberg 2000).

CABI (2009) makes a number of references to *A. fuscocupreanus*'s association with fruit suggesting that it does have potential to be on the pathway. Whilst CABI (2009) indicates that transport of larvae with fruit is unlikely, an estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation methodology.

The evidence provided in the draft report and additional evidence previously provided by DAFWA suggests that *A. fuscocupreanus* has a potential pathway association.

Comment 2: *Archips fuscocupreanus* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: The draft report appears to provide evidence of a potential pathway association for *A. fuscocupreanus*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *A. fuscocupreanus* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requested that *A. fuscocupreanus* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Archips semistructa Meyrick 1937

Comment 1: A potential pathway association for *Archips semistructa* has been justified as:

*'No. There is little specific information available on this species. However, larvae of the tribe Archipini spin and roll leaves. **Whilst they may feed on fruit** (Common 1990), damaged fruit would be noticed and not picked during harvest.'*

Whilst there is little specific information available on this species, DAFWA's submission to the draft pest categorisation provided additional evidence that larvae of the genus are known to feed on the surface of fruit in contact with leaves (Meijerman & Ulenberg 2000) for which the strawberry calyx would be suitable. In addition, damage caused by early instar larvae may not be detected during harvest.

The evidence provided in the draft report and additional evidence previously provided by DAFWA suggests that *A. semistructa* has a potential pathway association. The justifications for no pathway association appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and



is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Recommendation 1: In addition to the information provided in DAFWA's submission to the draft pest categorisation, the draft report appears to provide evidence of a potential pathway association for *A. semistructa*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *A. semistructa* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Archips semistructa* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Artaxa subflava Bremer 1864

Comment 1: A potential pathway association for *Artaxa subflava* has been justified as:

'No. Larvae of the Lymantriidae are often polyphagous but generally feed on foliage of woody shrubs and trees and less frequently on herbaceous plants (Common 1990). Whilst they are known to feed on fruits (Kristensen 1999), damaged fruit would be noticed and not picked during harvest.'

The evidence suggests that *A. subflava* has a potential pathway association. The justifications for no pathway association appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report. In addition, damage caused by early instar larvae may not be detected during harvest.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Comment 3: *Euproctis subflava* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: The draft report appears to provide evidence of a potential pathway association for *A. subflava*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *A. subflava* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Artaxa subflava* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Choristoneura lafauryana Ragonot 1875

Comment 1: A potential pathway association for *Choristoneura lafauryana* has been justified as:

'No. Larvae feed on the apical leaves of shoots and graze on fruit superficially (Meijerman & Ulenberg 2000). Other species in the genus have been known to feed on'



maturing fruit (Alford 2007). However, damaged fruit would be noticed and not picked during harvest.

The evidence suggests that *C. lafauryana* has a potential pathway association. The justifications for no pathway association appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report. In addition, damage caused by early instar larvae may not be detected during harvest.

Comment 2: The reasoning provided in the draft report appear not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Recommendation 1: The draft report appears to provide evidence of a potential pathway association for *C. lafauryana*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *C. lafauryana* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requested that *Choristoneura lafauryana* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Deroceras varians Adams 1868

Comment 1: A potential pathway association for *Deroceras varians* has been is justified as:

'No. Species of Deroceras feed on fruit and the leaves of strawberries (Broadley et al. 1988; Georgiev 2008; Zalom, Bolda & Phillips 2012), and known to damage ripe strawberry fruit, producing rough holes which may lead to secondary infestation by pests such as earwigs, sowbugs, and small beetles (Zalom et al. 2014a). Deroceras varians is known to attack strawberry leaves, stems, flowers and fruit in Korea (QIA 2015b). However, adults are unlikely to remain on harvested fruit during picking and packing, and damage to strawberries render the fruit unmarketable and they will not be packed for export. Eggs of all Stylommatophora are laid in soil crevices or in leaf litter (Clemente et al. 2008; Faberi et al. 2006).'

The evidence provided in the draft report suggests that *D. varians* has a pathway association. The justifications for no pathway association appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

In addition, juvenile slugs may not be detected during harvesting and packing, and minor damage caused to strawberries may not be detected during the grading process for packing to export.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Recommendation 1: The draft report provides evidence of a potential pathway association for *D. varians*. To ensure consistency with ISPM 11 and the methodology



outlined in the draft report, the potential to be on the pathway for *D. varians* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Deroceras varians* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Incillaria confusa Cockarell

Comment 1: A potential pathway association for *Incillaria confusa* has been justified as:

'No. Incillaria confusa is known to feed on strawberry leaves, stems, flowers and fruit in Korea (QIA 2015b). However, adults are unlikely to remain on harvested fruit during picking and packing. Eggs of all Styломmatophora are laid in soil crevices or in leaf litter (Clemente et al. 2008; Faberi et al. 2006).'

The evidence suggests that *I. confusa* has a potential pathway association. The justifications for no pathway association appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report

In addition, juvenile slugs may not be detected during harvesting and packing.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Recommendation 1: The draft report provides evidence of a potential pathway association for *I. confusa*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *I. confusa* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Incillaria confusa* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Nysius plebejus Distant 1883

Comment 1: A potential pathway association for *Nysius plebejus* has been justified as:

'No. Nysius species feed by piercing plant tissue with their mouthparts, and have been observed feeding on strawberries, causing discolouration, wilting and even death of plants at high infestation levels (Dara 2012). N. plebejus has been recorded as a pest of strawberry (Schaefer & Panazzi 2000). There is little other specific information on this species, however, adults and nymphs likely to be disturbed and move away from fruit during harvest, and symptoms of plant damage during high-density infestation are likely to be noticed during harvest.'

The evidence suggests that *N. plebejus* has a potential pathway association. The justifications for no pathway association appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest



management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

In addition, adults and nymphs disturbed during harvest have the potential to settle on harvested fruit.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Comment 3: *Nysius plebejus* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: The draft report provides evidence of a potential pathway association for *N. plebejus*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *N. plebejus* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Nysius plebejus* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Orbona fragariae Vieweg 1790

Comment 1: A potential pathway association for *Orbona fragariae* has been justified as:

'No. There is little specific information on this species. However, the larvae of the family Noctuidae mostly feed on live foliage, flowers, buds and fruits of woody or herbaceous plants (Common 1990; Kristensen 1999). Some species feed on dead leaves or debris (Common 1990). Damaged fruit would be noticed and not picked during harvest.'

The evidence provided suggests *O. fragariae* has a potential pathway association. The justifications for no pathway association appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

In addition, damage caused by early instar larvae may not be detected during harvest.

Comment 2: The reasoning provided in the draft report appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Recommendation 1: The draft report provides evidence of a potential pathway association for *O. fragariae*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *O. fragariae* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Orbona fragariae* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.



Pandemis heparana Denis & Schiffermüller 1776

Comment 1: A potential pathway association for *Pandemis heparana* has been justified as:

'No. Eggs are laid on the surface of leaves and larvae feed on flowers, fruitlets, young shoots and leaves. Larvae may graze on the surface of ripening fruit of a variety of plants (Alford 2007; Hill 1987; Meijerman & Ulenberg 2000; Yasuda 1972) but damaged fruit would be noticed and not picked during harvest.'

The evidence provided in the draft appear to indicate that *P. heparana* has a potential pathway association. The justifications provided for its absence from the pathway appear to be factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

In addition, damage caused by early instar larvae may not be detected during harvest.

Comment 2: The reasoning provided appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential and is inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Comment 3: *Pandemis heparana* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: The draft report provides evidence of a potential pathway association for *P. heparana*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *P. heparana* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Pandemis heparana* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Pseudaulacaspis pentagona Targioni Tozzetti 1886

Comment 1: *Pseudaulacaspis pentagona* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Comment 2: The decision to not treat *P. pentagona* as a regional quarantine pest for Western Australia is justified by:

'However, WA does not require mitigation measures for this pest for other hosts (such as stonefruit) from Australian states where this pest is present (DAFWA 2014; Poole et al. 2011).'

The reasoning provided does not justify the lack of further consideration as the risk assessment was based on stonefruit and not strawberry and may have a different risk profile. Previous risk analyses have acknowledged different fruit and production areas have the potential for different risk profiles.

'Pest risk assessments already exist for some of the pests considered here as they have been assessed previously by the Department of Agriculture. For these pests, the



likelihood of entry (importation and/or distribution) could be different from the previous assessment due to differences in the commodity, country and commercial production practices in the export areas, and hence will be re-assessed (Department of Agriculture 2014; 2015b; Department of Agriculture and Water Resources 2015).

Recommendation 1: DAFWA requests that *Pseudaulacaspis pentagona* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Pseudococcus comstocki Kuwana 1902

Comment 3: A potential pathway association for *Pseudococcus comstocki* has been justified as:

'No. This species has been found on strawberry leaves and stems but not fruit (QIA 2015b). This species is multivoltine; males mature 2-3 weeks after hatching (Spangler & Agnello 1991) whilst females mature after 6-8 weeks (CABI & EPPO 1981). Due to the variability of their development times, it can be expected that any development stage can be present during harvest. However, P. comstocki feed by extracting phloem sap from leaves and stems (CABI 2016), and Korean strawberries are packed without an attached peduncle, removing the possibility of P. comstocki being on the pathway.'

In DAFWA's submission to the draft pest categorisation for consideration of regional pests, evidence was provided where *P. comstocki* is known to infest fruits of other hosts with a tendency of second and third generation females to migrate from leaves to trunks, branches, fruits or other protected places (Pellizzari et al. 2012).

Additionally, the references cited in the draft report provide evidence that *P. comstocki* is associated with fruit or calyx of fruit (CABI 2015) and that eggs are laid in protected places, including occasionally in the calyx of fruit (Spangler & Agnello 1991). Spangler and Agnello (1991) also states as nymphs approach the adult stage, they can congregate inside the calyx of fruit. The draft report clarifies on page 3 that for this risk analysis, strawberries are defined as strawberry fruit which include calyx, fruit and achenes (seeds).

Comment 4: *Pseudococcus comstocki* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: In addition to the information provided in DAFWA's submission to the draft pest categorisation, the references cited in the draft report provide evidence of a potential pathway association for *P. comstocki*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *P. comstocki* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Pseudococcus comstocki* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.

Sparganothis pilleriana Denis & Schiffermuller 1775

Comment 1: A potential pathway association for *Sparganothis pilleriana* has been justified as:



'No. Eggs are laid on leaves. Larvae may cause substantial direct damage by feeding on shoot tips, leaves, inflorescences and fruit, as well as causing reduction in fruiting (Meijerman & Ulenberg 2000; Pykhova 1968; Schmidt-Tiedemann et al. 2001). It is a known pest of strawberry (Meijerman & Ulenberg 2000), however, damaged fruit would be noticed and not picked during harvest'

The evidence suggests that *S. pilleriana* has a potential pathway association. The justification provided are factors requiring consideration when assessing the probability of importation, particularly the assessment of pest management, cultural and commercial procedures applied at the place of origin as outlined in page 7 of the draft report.

In addition, damage caused by early instar larvae may not be detected during harvest.

Comment 2: The reasoning provided in the draft document appears not to justify an absence from the pathway. An estimate of likelihood does not eliminate the potential association and appears inconsistent with pest categorisation in accordance with ISPM 11 and the methodology as outlined in the draft report.

Comment 3: *Sparganthis pilleriana* has been assessed by DAFWA as meeting the IPPC definition of a quarantine pest for Western Australia and is regulated as a prohibited organism under s. 12 of the BAM Act 2007.

Recommendation 1: The draft report appear to provide evidence of a potential pathway association for *S. pilleriana*. To ensure consistency with ISPM 11 and the methodology outlined in the draft report, the potential to be on the pathway for *S. pilleriana* is suggested to be amended to 'Yes'.

Recommendation 2: DAFWA requests that *Sparganthis pilleriana* be considered further in the pest categorisation process to establish its quarantine pest status for this pathway; and, where appropriate, a risk assessment conducted to determine an unrestricted risk estimate.



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