Importation of coconut (*Cocos nucifera*) for consumption from Belize into the United States and Territories

A Qualitative, Pathway-Initiated Pest Risk Assessment

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Executive Summary
The Animal and Plant Health Inspection Service (APHIS) of the United States Department of Agriculture (USDA) prepared this document to assess pest risks associated with importing commercially-produced fruits of coconut, *Cocos nucifera* (Arecaceae), for consumption from Belize into the United States and Territories. Based on the market access submitted by Belize, we considered the pathway to include the fruits being culled in the field after harvest and washed in water, dried, and packed before shipment.

The pest risk ratings depend upon the application of all conditions of the pathway as described. Coconut fruits produced under different conditions were not evaluated and may have a different pest risk.

Using scientific literature, port-of-entry pest interception data, and information from the government of Belize, we developed a list of pests with quarantine significance for the United States and Territories that occur in Belize (on any host) and are associated with the commodity plant species (anywhere in the world).

We found no organisms that met the threshold for unacceptable consequences of introduction and are potentially able to follow the pathway.

Detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed separately from this document.
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1. Introduction

1.1. Background
The Plant Epidemiology and Risk Analysis Laboratory of the USDA Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) prepared this document to assess the pest risk associated with the importation of commercially-produced fresh fruit of coconut (Cocos nucifera L. ‘Malayan Yellow Dwarf’) for consumption from Belize (referred to as the export area) into the United States and Territories (referred to as the PRA area).

This is a qualitative risk assessment; the likelihood of pest introduction is expressed as a qualitative rating rather than in numerical terms. This methodology is consistent with guidelines provided by the International Plant Protection Convention (IPPC) in the International Standard for Phytosanitary Measures (ISPM) No. 11, “Pest Risk Analysis for Quarantine Pests” (IPPC, 2017). The use of biological and phytosanitary terms is consistent with ISPM No. 5, “Glossary of Phytosanitary Terms” (IPPC, 2018).

As defined in ISPM No. 11, this document comprises Stage 1 (Initiation) and Stage 2 (Risk Assessment) of risk analysis. Stage 3 (Risk Management) will be covered in a separate document.

1.2. Initiating event
The importation of fruits and vegetables for consumption into the United States is regulated under Title 7 of the Code of Federal Regulations, Part 319.56 (7 CFR §319.56). Under this regulation, the entry of coconut from Belize into the PRA area is not authorized. This commodity risk assessment was initiated due to a request by the Belize Agricultural Health Authority to change the Federal regulation to allow entry (BAHA, no date).

1.3. Determining if a weed risk analysis for the commodity is needed
In some cases, an imported commodity could become invasive in the PRA area. If warranted, the commodity is then analyzed for weed risk.

Weed risk analyses are not needed for commodities that are already enterable into the PRA area from other countries, for plant species that are widely established (native or naturalized) or cultivated in the PRA area, or for situations in which the imported plant parts cannot easily propagate on their own or be propagated. We determined that the weed risk of coconut does not need to be analyzed because it is widely established in the PRA area (NRCS, 2019).

1.4. Description of the pathway
A pathway is “any means that allows the entry or spread of a pest” (IPPC, 2018). In the context of this document, the pathway is the commodity to be imported, together with all the processes the commodity undergoes (from production through importation and distribution) that may have an impact on pest risk. The following description of this pathway focuses on those relevant conditions and processes. The conclusions in this document are therefore contingent on the application of all components of the pathway as described.
1.4.1. Description of the commodity
The specific pathway of concern is the importation of fresh fruit of coconut for consumption. The harvested coconut fruits will be seven to eight months old (BAHA, no date).

1.4.2. Summary of the production, harvest and post-harvest procedures, and shipping and storage conditions being considered
Based on the market access submitted by Belize (BAHA, no date), we considered the pathway to include the fruits being culled in the field after harvest and washed in water, dried, and packed before shipment.

Shipping and storage conditions are not being considered as part of the assessment.

2. Pest List and Pest Categorization
The pest list is a compilation of plant pests of quarantine significance for the PRA area. This includes pests that are both present in Belize (on any host) and are known to be associated with coconut (anywhere in the world). Pests are considered to be of quarantine significance if they are not present in the PRA area, are considered for or under Federal official control, or require evaluation for regulatory action. Consistent with ISPM 5, pests that meet any of these definitions are considered “quarantine pests” and are candidates for analysis. Species with a reasonable likelihood of following the pathway into the PRA area are analyzed to determine their pest risk potential.

2.1. Pest list
In Table 1, we list the quarantine pests that occur in the export area on any host and are associated with the commodity species, whether in the export area or elsewhere. For each pest, we indicate 1) the part of the plant the pest is generally associated with and 2) whether we selected the pest for further analysis. Pests selected for further analysis are those that are likely to remain with the commodity in a viable form following harvesting from the field and prior to any post-harvest processing. We developed this pest list based on the scientific literature, port-of-entry pest interception data, and information provided by the government of Belize. Pests in shaded rows were selected for further evaluation because they are likely to remain associated with the harvested commodity; for these pests we also denote U.S. distribution as appropriate.

Table 1. Quarantine pests associated with coconut (in any country) and present in Belize (on any host).

<table>
<thead>
<tr>
<th>Pest name</th>
<th>Presence in Belize</th>
<th>Host association</th>
<th>Plant part(s) 1</th>
<th>Considered further? 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACARI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eriophyidae</td>
<td></td>
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</tr>
</tbody>
</table>

1 The plant parts listed are those for the plant species under analysis. If the information has been extrapolated, such as from plant part association on other plant species, we note that.

2 “Yes” indicates simply that the pest has a reasonable likelihood of being associated with the harvested commodity; the level of pest prevalence on the harvested commodity (low, medium, or high) is qualitatively assessed as part of the Likelihood of Introduction assessment (section 3).
### Pest Risk Assessment for coconut from Belize

<table>
<thead>
<tr>
<th>Pest name</th>
<th>Presence in Belize</th>
<th>Host association</th>
<th>Plant part(s)</th>
<th>Considered further?</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aceria guerreronis</em> Keifer</td>
<td>CABI, 2020</td>
<td>CABI, 2020</td>
<td>Young fruit (CABI, 2020)</td>
<td>No. External feeder (Howard and Moore, 2014) that would likely be removed by post-harvest processing. <em>Aceria guerreronis</em> populations decline on coconuts older than six months (Howard and Moore, 2014), indicating they are less likely to be present on the seven- to eight-month-old harvested coconuts. Present in the United States (Florida) (Howard and Moore, 2014).</td>
</tr>
<tr>
<td>Tenuipalpidae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Raoiella indica</em> Hirst</td>
<td>BAHA, no date</td>
<td>BAHA, no date</td>
<td>Leaves (Jayaraj et al., 1991)</td>
<td>No.</td>
</tr>
<tr>
<td>INSECTA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLEOPTERA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curculionidae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEMIPTERA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aleyrodidae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pest name</td>
<td>Presence in Belize</td>
<td>Host association</td>
<td>Plant part(s)</td>
<td>Considered further?</td>
</tr>
<tr>
<td>-----------------------------------</td>
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<td>------------------</td>
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</tr>
<tr>
<td><em>Aleurodicus coccolobaе</em></td>
<td>Evans, 2007</td>
<td>Evans, 2007</td>
<td>Leaves (Quaintance and Baker, 1913)</td>
<td>No.</td>
</tr>
<tr>
<td><em>(Quaintance and Baker)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Aleurodicus rugioperculatus</em> Martin</td>
<td>Evans, 2007</td>
<td>Evans, 2007</td>
<td>Flowers, leaves, fruit (Selvaraj et al., 2016)</td>
<td>No. External feeder (Selvaraj et al., 2016) that would likely be removed by post-harvest processing. Present in the United States (Florida) (Kumar et al., 2017).</td>
</tr>
<tr>
<td><em>(Quaintance and Baker)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Pseudococcidae</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dysmicoccus texensis</em> (Tinsley)</td>
<td>García Morales et al., 2016</td>
<td>Culik et al., 2011</td>
<td>Fruit (Culik et al., 2011)</td>
<td>No. External feeder (Alves et al., 2009) that would likely be removed by post-harvest processing. Feeding behavior based on behavior on other hosts and plant parts.</td>
</tr>
</tbody>
</table>
### Pest name

<table>
<thead>
<tr>
<th>Pest name</th>
<th>Presence in Belize</th>
<th>Host association</th>
<th>Plant part(s)</th>
<th>Considered further?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maconellicoccus hirsutus (Green)</td>
<td>Chong et al., 2008</td>
<td>Garcia Morales et al., 2016</td>
<td>Flowers, fruits, shoots, stems (Chong et al., 2015)</td>
<td>No. External feeder (Chong et al., 2015) that would likely be removed by post-harvest processing. Feeding behavior based on behavior on other hosts and plant parts. Present in the United States (California, Florida, Guam, Hawaii, the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands) (Chong et al., 2015). No action required to St. Thomas (PestID, 2020).</td>
</tr>
</tbody>
</table>

**HYMENOPTERA**

**Formicidae**

| Atta cephalotes (Linnaeus) | IICA Caribbean Regional Center, no date | CABI, 2020 | Leaves (CABI, 2020) | No. |

**LEPIDOPTERA**

**Nymphalidae**

| Opsiphanes cassina fabricii (Boisduval) | Meerman, 1999 | Meerman, 1999 | Leaves, stems (Young and Muyshondt, 1975) | No. |

**Saturniidae**


**Tortricidae**

| Gymnandrosoma aurantianum Lima syn.: Ecdytolopha aurantianum (Lima), E. aurantiana Lima (Noboa et al., 2018) | White, 1999 | Bento et al., 2001 | Fruit (Bento et al., 2001) | No. Larvae feed in the pulp, leaving fruit unsuitable for consumption, and infested fruits drop prematurely (Bento et al., 2001; EPPO, 2017), so infested coconuts would not be harvested. |

**NEMATODES**
Pest Risk Assessment for coconut from Belize

<table>
<thead>
<tr>
<th>Pest name</th>
<th>Presence in Belize</th>
<th>Host association</th>
<th>Plant part(s)</th>
<th>Considered further?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhadinaphelenchus cocophilus (Cobb) Goodey, syn.: Bursaphelenchus cocophilus (Cobb) Baujard</td>
<td>CABI, 2020; EPPO, 2020; Giblin-Davis et al., 2010</td>
<td>Duarte et al., 2008; Giblin-Davis et al., 2010</td>
<td>Roots, stems, petioles, leaf axils (Giblin-Davis et al., 2010; Griffith, 1987).</td>
<td>No.</td>
</tr>
<tr>
<td>*Candidatus Phytoplasma palmae’</td>
<td>Ashburner et al., 1996; Gurr et al., 2016</td>
<td>Bahder et al., 2019; Gurr et al., 2016</td>
<td>Leaves, roots, seedlings, stems, and all plant tissues containing sieve tube elements (Oropeza et al., 2011)</td>
<td>No.</td>
</tr>
</tbody>
</table>

2.2. Pests considered but not included on the pest list

2.2.1. Organisms with non-quarantine status

We found evidence of organisms that are associated with coconut and are present in the export area but are not quarantine significant for the PRA area. These organisms are listed in the Appendix.

Armored scales (Hemiptera: Diaspididae): These insects are highly unlikely to establish via the pathway of fruits and vegetables intended for consumption due to their very limited ability to disperse to new host plants (Miller et al., 1985; PERAL, 2007). Further, diaspidids are considered non-actionable at U.S. ports of entry on fruits and vegetables for consumption (NIS, 2008). For these reasons, armored scales are not included in Table 1 but are listed in the Appendix even if they are not present in the PRA area.

2.2.2. Quarantine pests with weak evidence for association with the commodity or for presence in the export area

The Crop Protection Compendium (CABI, 2006) reported without direct evidence that *Atta sexdens* (Linnaeus) (Hymenoptera: Formicidae) was in Belize. A later version of the database, however, does not list it in Belize (CABI, 2020). We did not find any other evidence of its presence there, indicating the previous report is erroneous. Based on that evidence, we did not include *A. sexdens* on the pest list.
Older versions of the Crop Protection Compendium (CABI, 2004, 2005) listed coconut as a host for *Nasutitermes corniger* (Motschulsky) (Isoptera: Termitidae). The current version does not (CABI, 2020), and we did not find any other evidence of coconut being a host, indicating that the previous reports are erroneous. Based on that evidence, we did not include *N. corniger* on the pest list.

*Ceroplastes stellifer* Westwood (Hemiptera: Coccidae) has been intercepted on shipments from Belize (Miller et al., 2014). We did not, however, find any other evidence of it being established there. Since the infested shipments could have come through Belize from another location, we do not have enough evidence for *C. stellifer* being established in Belize and did not include it on the pest list.

The bacterial pathogen, *Xanthomonas axonopodis* pv. *vasculorum* (Cobb) Vauterin et al. [syn.: *X. campestris* pv. *vasculorum* (Cobb) Dye.] is present in Belize (Bradbury, 1986). Coconut is reported to be an experimental host of this pathogen through artificial inoculation (Bradbury, 1986; CABI, 2020). We did not find any evidence that coconut is a natural host of *X. axonopodis* pv. *vasculorum*. Therefore, we did not include this pathogen on the pest list (Table 1).

### 3. Summary and Conclusions of Risk Assessment

Of the organisms associated with coconut worldwide and present in the export area, we identified none that are quarantine pests for the PRA area, are likely to exceed the threshold for unacceptable consequences in the PRA area, and have a reasonable likelihood of following the commodity pathway.

Detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are not addressed in this document.

### 4. Literature Cited


BAHA. no date. Information about the commodity proposed for export to the United States. Belize Agricultural Health Authority (BAHA), Central Farm, Belize. 15 pp.


Poole, M. 2005. Green coffee scale Coccus viridis (Green) [Hemiptera: Coccidae] (No. 16/2005). Government of Western Australia, Department of Agriculture and Food. 2 pp.


5. Appendix: Pests with non-actionable regulatory status

We found some evidence of the listed organisms being associated with coconut and present in Belize. Because these organisms are not quarantine significant for the United States and Territories (PestID, 2020; or as defined by ISPM 5, IPPC, 2018), we did not list them in Table 1 of this risk assessment. Moreover, we did not evaluate the strength of the evidence for their association with coconut or their presence in Belize. Because we did not evaluate the strength of the evidence, we consider the following pests to have only “potential” association with the commodity and presence in Belize.

We list these organisms along with the references supporting their potential presence in Belize, their presence in the United States and Territories, and their potential association with the coconut. If any of the organisms listed in the table are not present in the United States and Territories, we also provide justification for their non-quarantine status.

<table>
<thead>
<tr>
<th>Organism</th>
<th>In Belize</th>
<th>In U.S.</th>
<th>Host Association</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ARTHROPODS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acari: Tenuipalpidae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brevipalpus phoenicis (Geijskes)</td>
<td>BAHA, no date</td>
<td>BAHA, no date</td>
<td>CABI, 2020</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><strong>Coleoptera: Silvanidae</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oryzaephilus surinamensis (Linnaeus)</td>
<td>BAHA, no date</td>
<td>BAHA, no date</td>
<td>CABI, 2020</td>
<td>Not Reportable (PestID, 2020). Feeds on copra (dried coconut meat) (CABI, 2020) and would not be associated with harvested coconut fruits (BAHA, no date).</td>
</tr>
<tr>
<td><strong>Coleoptera: Tenebrionidae</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hemiptera: Aleyrodidae</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aleurocerus palmae Russell</td>
<td>Martin, 2005</td>
<td>Hodges and Evans, 2005</td>
<td>Russel, 1986</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td>Aleurotrachelus atratus Hempel</td>
<td>Martin, no date</td>
<td>Halbert et al., 1999</td>
<td>Halbert et al., 1999</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td>Bemisia tabaci (Gennadius) Shatters et al., 2009</td>
<td>Shatters et al., 2009</td>
<td>Evans, 2005</td>
<td>Not Reportable (PestID, 2020). Only actionable on tomatoes from the Dominican Republic.</td>
<td></td>
</tr>
<tr>
<td><strong>Hemiptera: Aphididae</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cerataphis brasiliensis (Hempel) BAHA, no date</td>
<td>BAHA, no date</td>
<td>BAHA, no date</td>
<td>Not Reportable (PestID, 2020)</td>
<td></td>
</tr>
<tr>
<td><strong>Hemiptera: Cixiidae</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Pest Risk Assessment for coconut from Belize

**Haplaxius crudus** (Van Duzee)  
BAHA, no date  
BAHA, no date  
Tsai and Kirsch, 1978  
Not Reportable (PestID, 2020)

### Hemiptera: Coccidae

<table>
<thead>
<tr>
<th>Species</th>
<th>Author/Date</th>
<th>Author/Date</th>
<th>Author/Date</th>
<th>Reportability</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ceroplastes floridensis</em> (Comstock)</td>
<td>CABI, 2020</td>
<td>CABI, 2020</td>
<td>CABI, 2020</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Coccus viridis</em> (Green)</td>
<td>Maes, 2004</td>
<td>Maes, 2004</td>
<td>Poole, 2005</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Unaspis citri</em> Camstock</td>
<td>BAHA, no date</td>
<td>BAHA, no date</td>
<td>BAHA, no date</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
</tbody>
</table>

### Hemiptera: Diaspididae

<table>
<thead>
<tr>
<th>Species</th>
<th>Author/Date</th>
<th>Author/Date</th>
<th>Author/Date</th>
<th>Reportability</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aspidiotus destructor</em> Signoret</td>
<td>CABI, 2020</td>
<td>n/a</td>
<td>CABI, 2020</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Diaspis boisduvalii</em> (Signoret)</td>
<td>García Morales et al., 2016</td>
<td>n/a</td>
<td>García Morales et al., 2016</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Ischnaspis longirostris</em> (Signoret)</td>
<td>García Morales et al., 2016</td>
<td>n/a</td>
<td>García Morales et al., 2016</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Mycetaspis personata</em> (Comstock)</td>
<td>García Morales et al., 2016</td>
<td>n/a</td>
<td>García Morales et al., 2016</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Pinnaspis buxi</em> (Bouché)</td>
<td>García Morales et al., 2016</td>
<td>n/a</td>
<td>García Morales et al., 2016</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Pseudoaonidia trilobitiformis</em> (Green)</td>
<td>García Morales et al., 2016</td>
<td>n/a</td>
<td>García Morales et al., 2016</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Selenaspis articulatus</em> (Morgan)</td>
<td>CABI, 2020</td>
<td>n/a</td>
<td>CABI, 2020</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
</tbody>
</table>

### Hemiptera: Pseudococcidae

<table>
<thead>
<tr>
<th>Species</th>
<th>Author/Date</th>
<th>Author/Date</th>
<th>Author/Date</th>
<th>Reportability</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dysmicoccus brevipes</em> (Cockerell)</td>
<td>CABI, 2020</td>
<td>CABI, 2020</td>
<td>CABI, 2020</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Dysmicoccus neobrevipes</em> Beardsley</td>
<td>Beardsley, 1965</td>
<td>García Morales et al., 2016</td>
<td>García Morales et al., 2016</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Ferrisia dasylirii</em> (Cockerell)</td>
<td>García Morales et al., 2016</td>
<td>García Morales et al., 2016</td>
<td>García Morales et al., 2016</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
<tr>
<td><em>Ferrisia virgata</em> (Cockerell)</td>
<td>CABI, 2020</td>
<td>CABI, 2020</td>
<td>CABI, 2020</td>
<td>Not Reportable (PestID, 2020)</td>
</tr>
</tbody>
</table>

3 All armored scales (Diaspididae) are non-actionable at U.S. ports of entry on fruits and vegetables for consumption (NIS, 2008). Because they are non-actionable, we did not need to determine whether they occur in the United States.
### Paracoccus marginatus
*Garcia Morales et al., 2016*  
Not Reportable (PestID, 2020).

### Hymenoptera: Formicidae

**Tapinoma melanocephalum** (Fabricius)
- CABI, 2020
- CABI, 2020
- CABI, 2020  
Not Reportable (PestID, 2020).

### NEMATODES

**Helicotylenchus dihystera** (Cobb) Sher. syn.:  
*H. crenatus* Das, *H. flatus* Román, *H. punicae* Swarup & Sethi
- CABI, 2020
- CABI, 2020
- CABI, 2020  
Non-reportable (PestID, 2020).

**Meloidogyne incognita** (Kofoid & White) Chitwood
- CABI, 2020
- CABI, 2020
- CABI, 2020  
Non-reportable (PestID, 2020).

**Pratylenchus brachyurus** (Godfrey) Filipjev & Schuurmans Stekhoven syn.: *P. leiocephalus* Steiner, *P. steineri* Lordello, Zamith & Boock
- CABI, 2020
- CABI, 2020
- CABI, 2020  
Non-reportable (PestID, 2020).

**Pratylenchus coffeae** (Zimmermann) Filipjev & Schuurmans Steckhoven
- CABI, 2020
- CABI, 2020
- CABI, 2020  
Non-reportable (PestID, 2020).

**Pratylenchus zeae** Graham
- CABI, 2020
- CABI, 2020
- CABI, 2020  
Non-reportable (PestID, 2020).

**Rotylenchulus reniformis** Linford & Oliveira
- CABI, 2020
- CABI, 2020
- CABI, 2020  
Non-reportable (PestID, 2020).

**Xiphinema americanum** Cobb.
- EPPO, no date
- CABI, 2020
- CABI, 2020  
Non-reportable (PestID, 2020).

### FUNGI AND CHROMISTANS

**Beltrania rhombica** Penz. syn.: *B. indica* Subram
- Abarca, 1994
- Abarca, 1994; Sutton, 1978
- Farr and Rossman, 2020  
Non-reportable (PestID, 2020).

**Ceratocystis paradoxa** (Dade) C. Moreau, Syn.:  
*Chalara paradoxa* (De Seynes) Sacc., *Thielaviopsis paradoxa* (De Seynes) Höhn., *Endoconidiophora paradoxa* (De Seynes) R.W. Davidson
- CABI, 2020
- Farr and Rossman, 2020
- Farr and Rossman, 2020  
Non-reportable (PestID, 2020).

**Colletotrichum gloeosporioides** (Penz.) Penz. & Sacc. syn.:  
Lubbe et al., 2004
- Farr and Rossman, 2020
- Sun et al., 2016  
Non-reportable (PestID, 2020).
| **Glomerella cingulata**  
| **Gibberella fujikuroi**  
| **Lasiodiplodia theobromae** (Pat.) Griffon & Maubl. syn.: **Botryosphaeria rhodina** (Berk. & M.A. Curtis) Arx, **Botryodiplodia theobromae** Pat., **Diplodia theobromae** (Pat.) W. Nowell, **Diplodia cacaocola** Henn., **Diplodia natalensis** Pole-Evans | CABI, 2020 | Farr and Rossman, 2020 | Farr and Rossman, 2020 | Non-reportable (PestID, 2020). |
| **Rigidoporus microporus** (Sw.: Fr.) Overeem., syn.: **Polyporus microporus** (Sw.: Fr.) Fr. | Farr and Rossman, 1989 | Farr and Rossman, 2020 | Farr and Rossman, 2020 | Non-reportable (PestID, 2020) |