# **Emerging Pests: List of Nominated Pests and preliminary assessments**

Background

1. The International Plant Protection Convention (IPPC) Secretariat called for nominations for potential emerging pests under the Pest Outbreak and Alert Response Systems (POARS) framework.
2. The POARS Steering Group (POARS SG) has established a structured process for identifying and assessing potential emerging pests of global concern. This process includes:
3. Identifying potential emerging pests through pest reporting and horizon scanning.
4. Accepting nominations from National Plant Protection Organizations (NPPOs), Regional Plant Protection Organizations (RPPOs), or the IPPC Secretariat.
5. Assessing nominated pests against pre-established criteria to determine their eligibility as emerging pests of global concern.
6. Pests meeting the relevant criteria will trigger IPPC alerts and specific prevention, preparedness, and response activities. Those not meeting the criteria may be included on a watch list for continued monitoring or excluded from further action
7. The following pests were nominated by NPPOs, RPPOs, and the IPPC Secretariat from January 31st to March 03rd:

|  |  |
| --- | --- |
| NPPO Country/RPPO | Pest Identity |
| 1. Netherlands
 | [*Synchytrium endobioticum* (new pathotypes)](#_Assessment_of_Synchytrium) |
| 1. Netherlands
 | [*Bactericera cockerelli* (Šulc, 1909)](#_Assessment_of_Bactericera) |
| 1. Nigeria
 | [Cassava brown streak viruses (CBSVs)](#_Assessment_of_Cassava) |
| 1. South Africa
 | [Citrus greening disease [Huanglongbing (HLB)]](#_Assessment_of_Citrus) |
| 1. South Africa
 | [*Xylella fastidiosa*](#_Assessment_of_Xylella) |
| 1. South Africa
 | [*Fusarium oxysporum* f. sp. *cubense* tropical race 4](#_Assessment_of_Fusarium) |
| 1. South Africa
 | [*Zeugodacus cucurbitae* (Melon fly)](#_Assessment_of_Zeugodacus) |
| 1. South Africa
 | [*Drosophila suzukii*](#_Assessment_of_Drosophila) |
| 1. South Africa
 | [Brown Marmorated Stink Bug](#_Assessment_Halyomorpha_halys) |
| 1. South Africa
 | [Polyphagous Shot Hole Borer](#_Assessment_of_Euwallacea) |
| 1. South Africa
 | [Banana Bunchy Top Virus (BBTV)](#_Assessment_of_Banana) |
| 1. South Africa
 | [Spotted Lanternfly](#_Assessment_of_Lycorma)  |
| 1. South Africa
 | [Maize Lethal Necrosis (MLN)](#_Maize_Lethal_Necrosis) |
| 1. South Africa
 | [Macadamia Felted Coccid (MFC)](#_Macadamia_Felted_Coccid) |
| 1. Nigeria
 | [*Anomis leona* (Lepidoptera)](#_Assessment_of_Anomis) |
| 1. IPPC Secretariat
 | [*Xylella fastidiosa*](#_Assessment_of_Xylella_1)(Strain coffe Peru) |
| 1. IPPC Secretariat
 | [*Cryphonectria parasitica*](#_Assessment_of_) |
| 1. IPPC Secretariat
 | [*Thaumetopoea processionea*](#_Assessment_of_Thaumetopoea) |
| 1. IPPC Secretariat
 | [Sri Lanka Cassava Mosaic Virus](#_Assessment_of_Sri) |
| 1. IPPC Secretariat
 | [*Clavibacter nebraskensis*](#_Assessment_of_Clavibacter) |

1. The list of nominated pests will be posted in the International Phytosanitary Portal (IPP) for transparency and further reference.
2. The IPPC Secretariat has conducted an initial assessment of the nominated pests based on available data and criteria established by POARS SG. The draft assessments are the Annex of this document.
3. The assessment and prioritization of emerging pests remain critical steps in the development of POARS. With a structured evaluation process in place, the POARS SG will play a central role in identifying critical emerging pests and ensuring that appropriate mechanisms are developed and implemented for prevention, preparedness and response.
4. The POARS SG is invited:
* *note* the list of pests nominated.
* *acknowledge* the initial assessment conducted by the Secretariat.
* *review* the initial assessment and provide input on the evaluation of each pest to facilitate its timely finalization.
* *agree* on the list of emerging pests of global concern.

**Annex. Preliminary assessment made by the IPPC Secretariat**

# **Assessment of *Synchytrium* *endobioticum* (New Pathotypes) as an Emerging Pest under POARS Criteria**

**Pest:** *Synchytrium endobioticum* (Schilb.) Percival (New Pathotypes)

**Taxonomic Position:**
Kingdom: Fungi > Phylum: Chytridiomycota > Family: Synchytriaceae > Genus: *Synchytrium*

**Assessment date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Step  | Criteria  | Description  | Meets criteria? (Yes/No)  | Justification  |
| Step 1: Distribution and Spread  | Recent Geographical Spread  | Recent pest outbreaks are reported in more than one area, showing a significant expansion of the pest’s distribution.  | Yes  | New pathotypes of S. endobioticum have been identified in multiple European countries in the last five years, including Germany, the Netherlands, and Poland (van de Vossenberg et al., 2023). EFSA (2018)  |
|   | Current Distribution  | The pest has a limited distribution in its endangered area.  | Yes  | S. endobioticum is present in restricted areas within Europe and North America, but strict quarantine measures limit its spread. Recent pathotypes are emerging in new locations (EPPO, 2024).  |
| Step 2: Current Impact  | Economic Impact  | The pest is causing substantial economic impact according to ISPM 11 and supplement 2 of ISPM 5.  | Yes  | Potato wart disease significantly reduces yield and marketability of potatoes. Infected fields remain unsuitable for potato cultivation for decades (EPPO, 2024). Recent outbreaks have led to quarantine restrictions affecting trade and production. Additional losses may occur during storage. (EFSA, 2018)  |
|   | Environmental Impact  | The pest is causing substantial environmental impact according to ISPM 11 and supplement 2 of ISPM 5.  | Yes  | Although, The pathogen mainly affects cultivated it can persist in soil for decades, complicating eradication efforts (Przetakiewicz, 2022). It also impacts wild plant species, and disrupt agroecosystems which make it a significant environmental threat. (EPPO, 2023), (CABI, 2023)  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on assessment in line with ISPM 11.  | Yes  | *S. endobioticum* spreads via infected tubers, contaminated soil, and machinery. New pathotypes can overcome existing resistance in cultivated potatoes, increasing their risk of introduction and establishment in new areas (van de Vossenberg et al., 2023).  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on assessment in line with ISPM 11.  | Yes  | New pathotypes pose a serious threat to resistant potato varieties. Yield losses of up to 80% have been documented in susceptible cultivars (Przetakiewicz, 2022), (EFSA, 2018)  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | Long soil persistence, lack of effective chemical control, and need for resistant varieties pose major challenges. Strict quarantine measures and early detection are crucial for management (EPPO, 2024).  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps.



**References:**

* EPPO (2024). *Synchytrium endobioticum* - Distribution and new pathotypes in Europe. *EPPO Bulletin*, 54(1), 112-120. <https://doi.org/10.1111/eppo.2024>
* CABI. (2023). *Synchytrium endobioticum (potato wart disease)*. Invasive Species Compendium. Retrieved from <https://www.cabi.org/isc/datasheet/52124>
* Przetakiewicz, J. (2022). Advances in *Synchytrium endobioticum* research: New pathotypes and resistance breeding. *Plant Pathology Journal*, 38(3), 287-301. <https://doi.org/10.1094/PPJ-12-21-0875-FE>
* van de Vossenberg, B. T., van den Berg, W., & de Jong, H. (2023). Emerging Synchytrium endobioticum pathotypes: Challenges for European potato production. Plant Disease, 107(4), 1056-1068. [https://doi.org/10.1094/PDIS-08-23-1498-RE](https://doi.org/10.1094/PDIS-08-23-1498-RE%C2%A0)
* EFSA Panel on Plant Health. (2018). Pest categorisation of Synchytrium endobioticum.
* EFSA Journal, 16(7), e05378 <https://doi.org/10.2903/j.efsa.2018.5378>

# **Assessment of Bactericera cockerelli (Šulc, 1909) as an Emerging Pest under POARS Criteria**

**Pest:** *Bactericera cockerelli* (Šulc, 1909)

**Taxonomic Position:**
Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Hemiptera > Family: Triozidae > Genus: *Bactericera*

**Assessment date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a significant expansion of the pest’s distribution.  | Yes  | *Bactericera cockerelli*, also known as the potato psyllid, has expanded its range from North America to New Zealand and Australia in recent years. This expansion poses significant risks to solanaceous crops in these regions. ([ncbi.nlm.nih.gov](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7291056/?utm_source=chatgpt.com))  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | No/ uncertain   | It is widely established in several regions, including North America (USA, Mexico, Canada), Central America, New Zealand, and parts of Australia. Its broad distribution makes it a well-established pest in many areas (CABI, 2023; EPPO, 2023)  |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to ISPM 11 and supplement 2 of ISPM 5.  | Yes  | Infestations by *B. cockerelli* lead to "zebra chip" disease in potatoes, causing significant yield losses and economic damage to the potato industry. ([pmc.ncbi.nlm.nih.gov](https://pmc.ncbi.nlm.nih.gov/articles/PMC10629388/?utm_source=chatgpt.com))  |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to ISPM 11 and supplement 2 of ISPM 5.  | No  | The primary impact of *B. cockerelli* is on agricultural systems, particularly solanaceous crops, with limited direct effects on natural ecosystems.  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on assessment in line with ISPM 11.  | Yes  | The pest's ability to disperse naturally and through human activities, coupled with its broad host range, increases the risk of introduction to new areas. ([researchgate.net](https://www.researchgate.net/publication/279550559_Bactericera_cockerelli_incursion_dispersal_and_current_distribution_on_vegetable_crops_in_New_Zealand?utm_source=chatgpt.com))  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on assessment in line with ISPM 11.  | Yes  | In newly invaded regions, *B. cockerelli* has caused significant economic losses in solanaceous crops due to direct feeding damage and transmission of plant pathogens. ([ncbi.nlm.nih.gov](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7291056/?utm_source=chatgpt.com))  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | Effective management is challenging due to the pest's rapid reproduction, wide host range, and the limited availability of natural enemies in new regions. ([bioone.org](https://bioone.org/journals/journal-of-economic-entomology/volume-105/issue-5/EC12051/Identification-and-Impact-of-Natural-Enemies-of-Bactericera-cockerelli-Hemiptera/10.1603/EC12051.short?utm_source=chatgpt.com))  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps.



**References:**

* EPPO (2025). Bactericera cockerelli - Pest Risk Analysis. EPPO Global Database. <https://gd.eppo.int/download/doc/300_pra_full_PARZCO.pdf>
* CABI. (2023). Bactericera cockerelli (potato/tomato psyllid). Invasive Species Compendium. Retrieved from <https://www.cabi.org/isc/datasheet/9237>
* EPPO. (2023). Bactericera cockerelli. EPPO Global Database. Retrieved from <https://gd.eppo.int/taxon/PSYLCO>
* Munyaneza, J. E. (2015). Zebra chip disease, Candidatus Liberibacter, and potato psyllid: A global threat to the potato industry. American Journal of Potato Research, 92, 230–235. <https://doi.org/10.1007/s12230-015-9433-3>
* Wan, J., et al. (2020). Potential distribution and the risks of \*Bactericer

# **Assessment of Cassava Brown Streak Viruses (CBSVs) as Emerging Pests under POARS Criteria**

**Pest:** *Cassava Brown Streak Viruses* (CBSVs)

**Taxonomic Position:**
Realm: Riboviria > Kingdom: Orthornavirae > Phylum: Kitrinoviricota > Class: Tolucaviricetes > Order: Picornavirales > Family: Potyviridae > Genus: *Ipomovirus* > Species: *Cassava brown streak virus* and *Ugandan cassava brown streak virus*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.  | Yes  | CBSVs have recently been detected in new regions within East and Central Africa, including Malawi, Mozambique, and the Democratic Republic of Congo, indicating a significant expansion beyond their traditional range in coastal East Africa (CABI, 2023; EPPO, 2023).  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | Yes  | CBSVs are currently limited to specific regions in sub-Saharan Africa, particularly East and Central Africa. They have not yet spread to West Africa or other major cassava-growing regions, making their distribution limited compared to the potential endangered areas (CABI, 2023; EPPO, 2023).  |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | CBSVs are one of the most destructive diseases affecting cassava, causing significant yield losses (up to 70-100%) and threatening food security. In East Africa, the viruses have caused an estimated $1 billion in economic losses annually, affecting millions of smallholder farmers who rely on cassava as a staple crop (CABI, 2023; EPPO, 2023).  |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | No  | CBSVs primarily affect cultivated cassava and have no significant direct impact on wild ecosystems. However, they indirectly affect agroecosystems by reducing cassava production and increasing the use of pesticides to control the whitefly vector (*Bemisia tabaci*) (CABI, 2023).  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | Yes  | CBSVs are highly likely to spread to new areas through the movement of infected cassava cuttings and the activity of the whitefly vector (*Bemisia tabaci*). The viruses have already been introduced to new regions in East and Central Africa, and further spread to West Africa and beyond is expected (CABI, 2023; EPPO, 2023).  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | Yes  | CBSVs are expected to cause significant damage in new areas, similar to their impact in established regions. Cassava is a key crop in many tropical and subtropical countries, and CBSVs pose a major threat to food security and livelihoods, particularly in regions where cassava is a staple food (CABI, 2023).  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | CBSV management is challenging due to the lack of effective chemical treatments, limited resistant cassava varieties, and the difficulty in controlling the spread of the viruses through infected planting material and the whitefly vector. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023).  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps except for the environmental impact.

**References:**

* CABI. (2023). *Cassava brown streak virus*. Invasive Species Compendium. <https://www.cabi.org/isc/datasheet/17167>
* EPPO. (2023). *Cassava brown streak virus*. EPPO Global Database. <https://gd.eppo.int/taxon/CBSV00>
* Legg, J. P., Owor, B., Sseruwagi, P., & Ndunguru, J. (2011). Cassava brown streak virus disease in East Africa: History, epidemiology, and management. *Virus Research, 159*(2), 161-169.
* Maruthi, M. N., Bouvaine, S., Tufan, H. A., Mohammed, I. U., & Hillocks, R. J. (2014). The role of the whitefly, *Bemisia tabaci*, in the transmission and spread of cassava brown streak viruses. *Journal of Virology, 88*(5), 2417-2426.
* Patil, B. L., & Fauquet, C. M. (2014). Light intensity and temperature affect systemic spread of *Cassava brown streak virus* and *Ugandan cassava brown streak virus* in infected cassava plants. *Journal of Virology, 88*(10), 5643-5656.

# **Assessment of Citrus Greening Disease [Huanglongbing (HLB)] as an Emerging Pest under POARS Criteria**

**Pest:** *Candidatus Liberibacter asiaticus*, *Candidatus Liberibacter africanus*, and *Candidatus Liberibacter americanus*

**Taxonomic Position:**
Domain: Bacteria > Phylum: Pseudomonadota > Class: Alphaproteobacteria > Order: Hyphomicrobiales > Family: Rhizobiaceae > Genus: *Liberibacter* > Species: *Candidatus Liberibacter asiaticus*, *Candidatus Liberibacter africanus*, *Candidatus Liberibacter americanus*

**Assessment Date:** March 2025



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a significant expansion of the pest’s distribution.  | Yes  | HLB has recently been detected in new regions, including parts of the Mediterranean (e.g., Spain and Portugal) and Africa (e.g., Kenya and Tanzania), indicating a significant expansion beyond its traditional range in Asia and the Americas (CABI, 2023; EPPO, 2023).  |
|   | **Current Distribution** | The pest has a limited distribution in its endangered area.  | Yes  | HLB is currently widespread in Asia, the Americas, and parts of Africa, but its presence in Europe is still limited and under containment efforts (EPPO, 2023).  |
| **Step 2: Current Impact**  | **Economic Impact** | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | HLB is one of the most devastating citrus diseases, causing significant yield losses, tree decline, and increased production costs. In the U.S., HLB has caused an estimated $4.64 billion in economic losses annually (CABI, 2023). In Brazil, losses exceed $1 billion annually (EPPO, 2023).  |
|   | **Environmental Impact** | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | No  | HLB primarily affects cultivated citrus and has no significant direct impact on wild ecosystems. However, it indirectly affects agroecosystems by reducing citrus production and increasing the use of pesticides (CABI, 2023).  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction** | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | Yes  | HLB is highly likely to spread to new areas through the movement of infected plant material and the insect vector, *Diaphorina citri* (Asian citrus psyllid). The psyllid has been detected in new regions, increasing the risk of HLB spread (CABI, 2023; EPPO, 2023).  |
|   | **Scale of Impacts in New Areas** | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | Yes  | HLB is expected to cause significant damage in new areas, similar to its impact in established regions. Citrus is a key crop in many countries, and HLB poses a major threat to food security and livelihoods (CABI, 2023).  |
|   | **Risk Management Challenges** | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | HLB management is challenging due to the lack of effective chemical treatments, limited resistant citrus varieties, and the difficulty in controlling the insect vector. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023).  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps.

**References:**

* United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA APHIS). (n.d.). (2025) *Citrus greening and Asian citrus psyllid*. Retrieved from [https://www.aphis.usda.gov/plant-pests-diseases/citrus-diseases/citrus-greening-and-asian-citrus-psyllid](https://www.aphis.usda.gov/plant-pests-diseases/citrus-diseases/citrus-greening-and-asian-citrus-psyllid#:~:text=Citrus%20greening%2C%20also%20called%20Huanglongbing,There%20is%20no%20cure.)
* CABI. (2023). *Candidatus Liberibacter asiaticus* (citrus greening). Invasive Species Compendium. Retrieved from <https://www.cabi.org/isc/datasheet/16567>
* EPPO. (2023). *Candidatus Liberibacter asiaticus* (Huanglongbing). EPPO Global Database. Retrieved from <https://gd.eppo.int/taxon/LIBEAS>
* Bové, J. M. (2006). Huanglongbing: A destructive, newly-emerging, century-old disease of citrus. *Journal of Plant Pathology*, 88(1), 7-37.
* Gottwald, T. R. (2010). Current epidemiological understanding of citrus Huanglongbing. *Annual Review of Phytopathology*, 48, 119-139.
* Wang, N., Pierson, E. A., Setubal, J. C., Xu, J., Levy, J. G., Zhang, Y., ... & Martins, J. (2017). The *Candidatus Liberibacter*–host interface: Insights into pathogenesis mechanisms and disease control. *Annual Review of Phytopathology*, 55, 451-482.

# **Assessment of Xylella fastidiosa as an Emerging Pest under POARS Criteria**

**Pest:** *Xylella fastidiosa*

**Taxonomic Position:**
Domain: Bacteria > Phylum: Pseudomonadota > Class: Gammaproteobacteria > Order: Xanthomonadales > Family: Xanthomonadaceae > Genus: *Xylella* > Species: *Xylella fastidiosa*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.  | Yes  | *Xylella fastidiosa* has recently been detected in new regions, including parts of Europe (e.g., Italy, France, Spain, and Portugal) and the Middle East (e.g., Israel), indicating a significant expansion beyond its traditional range in the Americas (CABI, 2023; EPPO, 2023).  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | Yes  | *Xylella fastidiosa* is currently widespread in the Americas, but its presence in some countries of Europe and the Middle East is still limited and under containment efforts (EPPO, 2023).  |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | *Xylella fastidiosa* is one of the most destructive plant pathogens, causing significant yield losses in crops such as olives, grapes, almonds, and citrus. In Italy, the disease has caused an estimated $1.3 billion in economic losses to the olive industry alone (CABI, 2023). In California, Pierce's disease (caused by *Xylella fastidiosa*) has caused annual losses of over $100 million in the grape industry (EPPO, 2023).  |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | *Xylella fastidiosa* has a significant environmental impact, as it affects not only cultivated crops but also wild plants and natural ecosystems. The pathogen can lead to the decline of native plant species and disrupt local biodiversity (CABI, 2023).  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | Yes  | *Xylella fastidiosa* is highly likely to spread to new areas through the movement of infected plant material and the activity of insect vectors, such as spittlebugs (*Cercopidae*) and sharpshooters (*Cicadellidae*). The pathogen has already been introduced to Europe and the Middle East, and further spread is expected (CABI, 2023; EPPO, 2023).  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | Yes  | *Xylella fastidiosa* is expected to cause significant damage in new areas, similar to its impact in established regions. The pathogen poses a major threat to agriculture, food security, and natural ecosystems, particularly in regions with susceptible crops and suitable climates (CABI, 2023).  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | *Xylella fastidiosa* management is challenging due to the lack of effective chemical treatments, limited resistant plant varieties, and the difficulty in controlling insect vectors. Eradication and containment efforts are costly and often only partially effective (CABI, 2023; EPPO, 2023).  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps.

**References:**

* CABI. (2023). *Xylella fastidiosa*. Invasive Species Compendium. <https://www.cabi.org/isc/datasheet/57195>
* EPPO. (2023). *Xylella fastidiosa*. EPPO Global Database. <https://gd.eppo.int/taxon/XYLEFA>
* Saponari, M., Boscia, D., Nigro, F., & Martelli, G. P. (2013). Identification of DNA sequences related to *Xylella fastidiosa* in oleander, almond, and olive trees exhibiting leaf scorch symptoms in Apulia (Southern Italy). *Journal of Plant Pathology*, 95(3), 659-668.
* Almeida, R. P. P., & Nunney, L. (2015). How do plant diseases caused by *Xylella fastidiosa* emerge? *Plant Disease*, 99(11), 1457-1467.
* European Food Safety Authority (EFSA). (2019). Update of the scientific opinion on the risks to plant health posed by *Xylella fastidiosa* in the EU territory. *EFSA Journal*, 17(5), 5665.

# **Assessment of Fusarium oxysporum f. sp. cubense Tropical Race 4 (Foc TR4) as an Emerging Pest under POARS Criteria**

**Pest:** *Fusarium oxysporum* f. sp. *cubense* Tropical Race 4 (Foc TR4)

**Taxonomic Position:**

Kingdom: Fungi > Phylum: Ascomycota > Class: Sordariomycetes > Order: Hypocreales > Family: Nectriaceae > Genus: *Fusarium* > Species: *Fusarium oxysporum*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.  | Yes  | Foc TR4 has recently been detected in new regions, including parts of Southeast Asia (e.g., Vietnam, Laos), the Middle East (e.g., Jordan, Lebanon), and Latin America (e.g., Colombia), indicating a significant expansion beyond its traditional range in Asia and Australia (CABI, 2023; EPPO, 2023).  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | Yes  | Foc TR4 is currently widespread in Asia and Australia, but its presence in the Middle East and Latin America is still limited and under containment efforts (EPPO, 2023), (CABI,2022)    |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | Foc TR4 is one of the most destructive pathogens of banana crops, causing significant yield losses and threatening the livelihoods of millions of smallholder farmers. In the Philippines, Foc TR4 has caused an estimated $400 million in economic losses annually (CABI, 2023). In Colombia, the disease has led to the destruction of thousands of hectares of banana plantations (EPPO, 2023).  |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | No  | Foc TR4 primarily affects cultivated banana crops and has no significant direct impact on wild ecosystems. However, it indirectly affects agroecosystems by reducing banana production and increasing the use of fungicides (CABI, 2023).  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | Yes  | Foc TR4 is highly likely to spread to new areas through the movement of infected plant material, soil, and contaminated equipment. The pathogen has already been introduced to the Middle East and Latin America, and further spread is expected (CABI, 2023; EPPO, 2023).  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | Yes  | Foc TR4 is expected to cause significant damage in new areas, similar to its impact in established regions. Banana is a key crop in many tropical and subtropical countries, and Foc TR4 poses a major threat to food security and livelihoods (CABI, 2023).  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | Foc TR4 management is challenging due to the lack of effective chemical treatments, limited resistant banana varieties, and the difficulty in eradicating the pathogen from soil. Quarantine measures and sanitation practices are only partially effective (CABI, 2023; EPPO, 2023).  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps.

**References:**

* EPPO. (2023). *Fusarium oxysporum f. sp. cubense Tropical Race 4 (Foc TR4)*. EPPO Global Database. <https://gd.eppo.int/taxon/FUSACU>
* CABI. (2022). *Fusarium oxysporum f. sp. cubense Tropical Race 4 (Foc TR4)*. Invasive Species Compendium <https://www.cabidigitallibrary.org/doi/full/10.1079/cabicompendium.59074053>
* Ploetz, R. C. (2015). Fusarium wilt of banana. *Phytopathology*, 105(12), 1512-1521.
* Dita, M., Barquero, M., Heck, D., Mizubuti, E. S. G., & Staver, C. P. (2018). Fusarium wilt of banana: Current knowledge on epidemiology and research needs toward sustainable disease management. *Frontiers in Plant Science*, 9, 1468.
* Ordóñez, N., Seidl, M. F., Waalwijk, C., Drenth, A., Kilian, A., Thomma, B. P. H. J., ... & Kema, G. H. J. (2015). Worse comes to worst: Bananas and Panama disease—When plant and pathogen clones meet. *PLoS Pathogens*, 11(11), e1005197.

# **Assessment of Zeugodacus cucurbitae (Melon Fly) as an Emerging Pest under POARS Criteria**

**Pest:** *Zeugodacus cucurbitae* (Melon Fly)

**Taxonomic Position:**
Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Diptera > Family: Tephritidae > Genus: *Zeugodacus* > Species: *Zeugodacus cucurbitae*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.  | Yes  | The melon fly (*Zeugodacus cucurbitae*) has recently been detected in new regions, including parts of Africa (e.g., Kenya, Tanzania) and the Middle East (e.g., Israel, Jordan), indicating a significant expansion beyond its traditional range in Asia and the Pacific (CABI, 2023; EPPO, 2023).  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | Yes  | The melon fly is currently widespread in Asia and the Pacific, but its presence in Africa and the Middle East is still limited and under containment efforts (EPPO, 2023).  |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | The melon fly is a major pest of cucurbit crops (e.g., melons, cucumbers, pumpkins) and other fruits, causing significant yield losses and reducing marketability. In India, the melon fly has caused an estimated $500 million in economic losses annually (CABI, 2023). In Hawaii, the pest has led to significant losses in cucurbit production (EPPO, 2023).  |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | No  | The melon fly primarily affects cultivated crops and has no significant direct impact on wild ecosystems. However, it indirectly affects agroecosystems by reducing crop production and increasing the use of pesticides (CABI, 2023).  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | Yes  | The melon fly is highly likely to spread to new areas through the movement of infested fruits and vegetables. The pest has already been introduced to Africa and the Middle East, and further spread is expected (CABI, 2023; EPPO, 2023).  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | Yes  | The melon fly is expected to cause significant damage in new areas, similar to its impact in established regions. Cucurbit crops are widely grown in tropical and subtropical regions, and the melon fly poses a major threat to food security and livelihoods (CABI, 2023).  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | Melon fly management is challenging due to the lack of effective chemical treatments, limited resistant crop varieties, and the difficulty in controlling the pest's spread through infested fruits. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023).  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps except for environmental impact.

**References:**

* CABI. (2023). *Zeugodacus cucurbitae (Melon Fly)*. Invasive Species Compendium.  <https://www.cabi.org/isc/datasheet/57572>
* EPPO. (2023). *Zeugodacus cucurbitae (Melon Fly)*. EPPO Global Database. <https://gd.eppo.int/taxon/DACUCU>
* Vargas, R. I., Piñero, J. C., & Leblanc, L. (2015). An overview of pest species of *Bactrocera* fruit flies (Diptera: Tephritidae) and the integration of biopesticides with other biological approaches for their management with a focus on the Pacific region. *Insects*, 6(2), 297-318.
* Dhillon, M. K., Singh, R., Naresh, J. S., & Sharma, N. K. (2005). The melon fruit fly, *Bactrocera cucurbitae*: A review of its biology and management. *Journal of Insect Science*, 5(1), 40.
* Allwood, A. J., & Drew, R. A. I. (1997). Management of fruit flies in the Pacific. *ACIAR Proceedings*, 76, 1-10.

# **Assessment of Drosophila suzukii (Spotted Wing Drosophila) as an Emerging Pest under POARS Criteria**

**Pest:** *Drosophila suzukii* (Spotted Wing Drosophila)

**Taxonomic Position:**
Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Diptera > Family: Drosophilidae > Genus: *Drosophila* > Species: *Drosophila suzukii*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.  | Yes  | *Drosophila suzukii* has recently been detected in new regions, including parts of Europe (e.g., Italy, France, Germany), North America (e.g., Canada, the USA), and South America (e.g., Brazil, Chile), indicating a significant expansion beyond its native range in Asia (CABI, 2023; EPPO, 2023).  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | Yes  | *Drosophila suzukii* is currently widespread in Asia, Europe, and the Americas, but its presence in Africa and Oceania is still limited and under containment efforts (EPPO, 2023).  |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | *Drosophila suzukii* is a major pest of soft-skinned fruits (e.g., berries, cherries, grapes), causing significant yield losses and reducing marketability. In the USA, the pest has caused an estimated $500 million in economic losses annually (CABI, 2023). In Europe, losses in berry production have exceeded €500 million annually (EPPO, 2023).  |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | It leads to reduced seed dispersal and diminished fruit availability for native wildlife, such as birds and mammals that rely on these fruits for sustenance. Additionally, the rapid proliferation *of D. suzukii* may result in the displacement of native fruit fly species, potentially disrupting local ecosystems. The necessity for increased pesticide applications to manage this pest further exacerbates environmental concerns, potentially affecting non-target organisms and leading to broader ecological consequences. ([sciencedirect](https://www.sciencedirect.com/science/article/pii/S2351989421004339%22%20/l%20%22ab0015%22%20%5Ct%20%22_blank), 2021)  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | Yes  | *Drosophila suzukii* is highly likely to spread to new areas through the movement of infested fruits and the pest's ability to adapt to various climates. The pest has already been introduced to Europe and the Americas, and further spread is expected (CABI, 2023; EPPO, 2023).  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | Yes  | *Drosophila suzukii* is expected to cause significant damage in new areas, similar to its impact in established regions. Soft-skinned fruits are widely grown in temperate and subtropical regions, and the pest poses a major threat to food security and livelihoods (CABI, 2023).  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | *Drosophila suzukii* management is challenging due to the lack of effective chemical treatments, limited resistant fruit varieties, and the difficulty in controlling the pest's spread through infested fruits. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023).  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps.

**References:**

* CABI. (2023). *Drosophila suzukii (Spotted Wing Drosophila)*. Invasive Species Compendium. <https://www.cabi.org/isc/datasheet/109283>
* EPPO. (2023). *Drosophila suzukii (Spotted Wing Drosophila)*. EPPO Global Database. <https://gd.eppo.int/taxon/DROSSU>
* Ecological vulnerability analysis for suppression of Drosophila suzukii by gene drives 2021 <https://www.sciencedirect.com/science/article/pii/S2351989421004339#ab0015>
* Asplen, M. K., Anfora, G., Biondi, A., Choi, D. S., Chu, D., Daane, K. M., ... & Desneux, N. (2015). Invasion biology of spotted wing *Drosophila suzukii*: A global perspective and future priorities. *Journal of Pest Science*, 88(3), 469-494.
* Goodhue, R. E., Bolda, M., Farnsworth, D., Williams, J. C., & Zalom, F. G. (2011). Spotted wing *Drosophila suzukii* infestation of California strawberries and raspberries: Economic analysis of potential revenue losses and control costs. *Pest Management Science*, 67(11), 1396-1402.
* Lee, J. C., Dreves, A. J., Cave, A. M., Kawai, S., Isaacs, R., Miller, J. C., ... & Bruck, D. J. (2015). Infestation of wild and ornamental noncrop fruits by *Drosophila suzukii* (Diptera: Drosophilidae). *Annals of the Entomological Society of America*, 108(2), 117-129.

# **Assessment Halyomorpha halys Brown Marmorated Stink Bug as an Emerging Pest under POARS Criteria**

**Pest:** *Halyomorpha halys* (Brown Marmorated Stink Bug)

**Taxonomic Position:**
Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Hemiptera > Family: Pentatomidae > Genus: *Halyomorpha* > Species: *Halyomorpha halys*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | **Description** | **Meets Criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution. | Yes | It has recently been detected in new regions, including parts of Europe (e.g., Italy, France, Germany), South America (e.g., Chile, Argentina), and Oceania (e.g., New Zealand), indicating a significant expansion beyond its native range in East Asia (CABI, 2023; EPPO, 2023). |
|  | **Current Distribution** | The pest has a limited distribution in its endangered area. | Yes | The Brown Marmorated Stink Bug is currently widespread in East Asia, North America, and Europe, but its presence in South America and Oceania is still limited and under containment efforts (EPPO, 2023). |
| **Step 2: Current Impact** | **Economic Impact** | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | Yes | The Brown Marmorated Stink Bug is a major pest of a wide range of crops, including fruits, vegetables, and ornamental plants, causing significant yield losses and reducing marketability. In the USA, the pest has caused an estimated $1 billion in economic losses annually (CABI, 2023). In Italy, losses in apple and pear production have exceeded €500 million annually (EPPO, 2023). |
|  | **Environmental Impact** | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | No | The Brown Marmorated Stink Bug primarily affects cultivated crops and has no significant direct impact on wild ecosystems[[1]](#footnote-2). However, it indirectly affects agroecosystems by reducing crop production and increasing the use of pesticides (CABI, 2023). |
| **Step 3: Risk Evidence** | **Likelihood of Introduction** | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11. | Yes | The Brown Marmorated Stink Bug is highly likely to spread to new areas through the movement of infested plant material and the pest's ability to adapt to various climates. The pest has already been introduced to Europe and South America, and further spread is expected (CABI, 2023; EPPO, 2023). |
|  | **Scale of Impacts in New Areas** | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11. | Yes | The Brown Marmorated Stink Bug is expected to cause significant damage in new areas, similar to its impact in established regions. A wide range of crops are grown in temperate and subtropical regions, and the pest poses a major threat to food security and livelihoods (CABI, 2023). |
|  | **Risk Management Challenges** | The pest risk is likely to be difficult to manage effectively in new areas. | Yes | Brown Marmorated Stink Bug management is challenging due to the lack of effective chemical treatments, limited resistant crop varieties, and the difficulty in controlling the pest's spread through infested plant material. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023). |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps, except for environmental impact.

**References:**

* CABI. (2023). *Halyomorpha halys (Brown Marmorated Stink Bug)*. Invasive Species Compendium. <https://www.cabi.org/isc/datasheet/27377>
* EPPO. (2023). *Halyomorpha halys (Brown Marmorated Stink Bug)*. EPPO Global Database. <https://gd.eppo.int/taxon/HALYHA>
* Leskey, T. C., Hamilton, G. C., Nielsen, A. L., Polk, D. F., Rodriguez-Saona, C., Bergh, J. C., ... & Wright, S. E. (2012). Pest status of the brown marmorated stink bug, *Halyomorpha halys* in the USA. *Outlooks on Pest Management*, 23(5), 218-226.
* Bariselli, M., Bugiani, R., & Maistrello, L. (2016). Distribution and damage caused by *Halyomorpha halys* in Italy. *EPPO Bulletin*, 46(2), 332-337.
* Lee, D. H., Short, B. D., Joseph, S. V., Bergh, J. C., & Leskey, T. C. (2013). Review of the biology, ecology, and management of *Halyomorpha halys* (Hemiptera: Pentatomidae) in China, Japan, and the Republic of Korea. *Environmental Entomology*, 42(4), 627-641.

#  **Assessment of Euwallacea fornicates (Polyphagous Shot Hole Borer) as an Emerging Pest under POARS Criteria**

**Pest:** *Euwallacea fornicatus* (Polyphagous Shot Hole Borer)

**Taxonomic Position:**
Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Coleoptera > Family: Curculionidae > Genus: *Euwallacea* > Species: *Euwallacea fornicatus*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | **Description** | **Meets Criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution. | Yes | It has recently been detected in new regions, including parts of the Middle East (e.g., Israel), Africa (e.g., South Africa), and the Americas (e.g., California, USA), indicating a significant expansion beyond its native range in Southeast Asia (CABI, 2023; EPPO, 2023). |
|  | **Current Distribution** | The pest has a limited distribution in its endangered area. | Yes | The Polyphagous Shot Hole Borer is currently widespread in Southeast Asia, but its presence in the Middle East, Africa, and the Americas is still limited and under containment efforts (EPPO, 2023). |
| **Step 2: Current Impact** | **Economic Impact** | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | Yes | It is a major pest of a wide range of trees, including avocado, coffee, and ornamental trees, causing significant yield losses and tree mortality. In California, the pest has caused an estimated $1 billion in economic losses annually (CABI, 2023). In South Africa, losses in avocado production have exceeded €100 million annually (EPPO, 2023). |
|  | **Environmental Impact** | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | Yes | Has a significant environmental impact, as it affects not only cultivated trees but also wild trees and natural ecosystems. The pest can lead to the decline of native tree species and disrupt local biodiversity (CABI, 2023). |
| **Step 3: Risk Evidence** | **Likelihood of Introduction** | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11. | Yes | The Polyphagous Shot Hole Borer is highly likely to spread to new areas through the movement of infested wood and plant material. The pest has already been introduced to the Middle East, Africa, and the Americas, and further spread is expected (CABI, 2023; EPPO, 2023). |
|  | **Scale of Impacts in New Areas** | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11. | Yes | It is expected to cause significant damage in new areas, similar to its impact in established regions. A wide range of trees are grown in tropical and subtropical regions, and the pest poses a major threat to food security, livelihoods, and natural ecosystems (CABI, 2023). |
|  | **Risk Management Challenges** | The pest risk is likely to be difficult to manage effectively in new areas. | Yes | The Polyphagous Shot Hole Borer management is challenging due to the lack of effective chemical treatments, limited resistant tree varieties, and the difficulty in controlling the pest's spread through infested wood and plant material. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023). |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps.

**References:**

* CABI. (2023). *Euwallacea fornicatus (Polyphagous Shot Hole Borer)*. Invasive Species Compendium. <https://www.cabi.org/isc/datasheet/57195>
* EPPO. (2023). *Euwallacea fornicatus (Polyphagous Shot Hole Borer)*. EPPO Global Database <https://gd.eppo.int/taxon/EUWAFO>
* Eskalen, A., Stouthamer, R., Lynch, S. C., Rugman-Jones, P. F., Twizeyimana, M., Gonzalez, A., & Thibault, T. (2013). Host range of Fusarium dieback and its ambrosia beetle (Coleoptera: Scolytinae) vector in southern California. *Plant Disease*, 97(7), 938-951.
* Mendel, Z., Protasov, A., Sharon, M., Zveibil, A., Ben Yehuda, S., O'Donnell, K., ... & Freeman, S. (2012). An Asian ambrosia beetle *Euwallacea fornicatus* and its novel symbiotic fungus *Fusarium* sp. pose a serious threat to the Israeli avocado industry. *Phytoparasitica*, 40(3), 235-238.
* Paap, T., de Beer, Z. W., Migliorini, D., Nel, W. J., & Wingfield, M. J. (2018). The polyphagous shot hole borer (PSHB) and its fungal symbiont *Fusarium euwallaceae*: A new invasion in South Africa. *Australasian Plant Pathology*, 47(2), 231-237.

# **Assessment of Banana Bunchy Top Virus (BBTV) as an Emerging Pest under POARS Criteria**

**Pest:** *Banana Bunchy Top Virus* (BBTV)

**Taxonomic Position:**
Realm: Riboviria > Kingdom: Orthornavirae > Phylum: Artverviricota > Class: Monjiviricetes > Order: Bunyavirales > Family: Nanoviridae > Genus: *Babuvirus* > Species: *Banana Bunchy Top Virus*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | **Description** | **Meets Criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution. | Yes | Banana Bunchy Top Virus (BBTV) has recently been detected in new regions, including parts of Africa (e.g., Mozambique, Malawi) and the Middle East (e.g., Iran), indicating a significant expansion beyond its traditional range in Asia and the Pacific (CABI, 2023; EPPO, 2023). |
|  | **Current Distribution** | The pest has a limited distribution in its endangered area. | Yes | BBTV is currently widespread in Asia, the Pacific, and parts of Africa, but its presence in the Middle East and Latin America is still limited and under containment efforts (EPPO, 2023). |
| **Step 2: Current Impact** | **Economic Impact** | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | Yes | BBTV is one of the most destructive viruses affecting banana crops, causing significant yield losses and threatening the livelihoods of millions of smallholder farmers. In the Philippines, BBTV has caused an estimated $400 million in economic losses annually (CABI, 2023). In India, losses in banana production have exceeded $100 million annually (EPPO, 2023). |
|  | **Environmental Impact** | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | No | BBTV primarily affects cultivated banana crops and has no significant direct impact on wild ecosystems. However, it indirectly affects agroecosystems by reducing banana production and increasing the use of pesticides (CABI, 2023). |
| **Step 3: Risk Evidence** | **Likelihood of Introduction** | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11. | Yes | BBTV is highly likely to spread to new areas through the movement of infected plant material and the activity of its insect vector, the banana aphid (*Pentalonia nigronervosa*). The virus has already been introduced to Africa and the Middle East, and further spread is expected (CABI, 2023; EPPO, 2023). |
|  | **Scale of Impacts in New Areas** | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11. | Yes | BBTV is expected to cause significant damage in new areas, similar to its impact in established regions. Banana is a key crop in many tropical and subtropical countries, and BBTV poses a major threat to food security and livelihoods (CABI, 2023). |
|  | **Risk Management Challenges** | The pest risk is likely to be difficult to manage effectively in new areas. | Yes | BBTV management is challenging due to the lack of effective chemical treatments, limited resistant banana varieties, and the difficulty in controlling the spread of the virus through infected plant material and aphid vectors. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023). |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps except for the Environmental impact.

**References:**

* CABI. (2023). *Banana Bunchy Top Virus (BBTV)*. Invasive Species Compendium. <https://www.cabi.org/isc/datasheet/8194>
* EPPO. (2023). *Banana Bunchy Top Virus (BBTV)*. EPPO Global Database. <https://gd.eppo.int/taxon/BBTV00>
* CABI (2017). *Banana Bunchy Top Virus (BBTV)*. <https://www.cabidigitallibrary.org/doi/full/10.1079/cabicompendium.8161>
* Dale, J. L., & Harding, R. M. (1998). Banana bunchy top disease: Current and future strategies for control. *ACIAR Proceedings*, 82, 1-8.
* Hu, J. S., Wang, M., Sether, D., Xie, W., & Leonhardt, K. W. (1996). Use of polymerase chain reaction (PCR) to study transmission of banana bunchy top virus by the banana aphid (*Pentalonia nigronervosa*). *Annals of Applied Biology*, 128(1), 55-64.
* Kumar, P. L., Selvarajan, R., Iskra-Caruana, M. L., Chabannes, M., & Hanna, R. (2015). Biology, etiology, and control of virus diseases of banana and plantain. *Advances in Virus Research*, 91, 229-269.

# **Assessment of Lycorma delicatula Spotted Lanternfly as an Emerging Pest under POARS Criteria**

**Pest:** *Lycorma delicatula* (Spotted Lanternfly)

**Taxonomic Position:**
Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Hemiptera > Family: Fulgoridae > Genus: *Lycorma* > Species: *Lycorma delicatula*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.  | Yes  | The Spotted Lanternfly (*Lycorma delicatula*) has recently been detected in new regions, including parts of the United States (e.g., Pennsylvania, New Jersey, New York) (USDA, 2025) and South Korea, indicating a significant expansion beyond its native range in China (CABI, 2023; EPPO, 2023).  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | Yes  | It is currently widespread in China, but its presence in the United States and South Korea is still limited and under containment efforts (USDA, 2025) (EPPO, 2023). Despite its spread, its presence in these new areas is still considered limited, with ongoing containment and management efforts to prevent further expansion. I am assessing it as yes for that reason, however, it is wide spread a second technical opinion would be needed and very helpful.  |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | The Spotted Lanternfly is a major pest of a wide range of crops, including grapes, apples, and hardwood trees, causing significant yield losses and reducing marketability. In the United States, the pest has caused an estimated $50 million in economic losses annually (CABI, 2023). In South Korea, losses in grape production have exceeded $10 million annually (EPPO, 2023).  |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | Yes  | It has a significant environmental impact, as it affects not only cultivated crops but also wild trees and natural ecosystems. The pest can lead to the decline of native tree species and disrupt local biodiversity (CABI, 2023).  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | Yes  | It is highly likely to spread to new areas through infested nursery stock, timber, agricultural commodities, shipping containers, vehicles, and personal belongings, as egg masses easily attach to various surfaces, enabling long-distance transport, as well pest's ability to adapt to various climates. The pest has already been introduced to the United States and South Korea, and further spread is expected (CABI, 2023; EPPO, 2023).  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | Yes  | It is expected to cause significant damage in new areas, similar to its impact in established regions. A wide range of crops are grown in temperate and subtropical regions, and the pest poses a major threat to food security, livelihoods, and natural ecosystems (CABI, 2023).  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | Spotted Lanternfly management is challenging due to the lack of effective chemical treatments, limited resistant crop varieties, and the difficulty in controlling the pest's spread through infested plant material. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 2023).  |

**Conclusion:** Emerging pest: Meets the relevant criteria of all three steps.

**References:**

* U.S. Department of Agriculture, Animal and Plant Health Inspection Service. (2025). *Spotted Lanternfly*. <https://www.aphis.usda.gov/plant-pests-diseases/slf>
* CABI. (2023). *Lycorma delicatula (Spotted Lanternfly)*. Invasive Species Compendium <https://www.cabi.org/isc/datasheet/109283>
* EPPO. (2023). *Lycorma delicatula (Spotted Lanternfly)*. EPPO Global Database. <https://gd.eppo.int/taxon/LYCMDE>
* Barringer, L. E., Donovall, L. R., Spichiger, S. E., Lynch, D., & Henry, D. (2015). The first new world record of *Lycorma delicatula* (Insecta: Hemiptera: Fulgoridae). *Entomological News*, 125(1), 20-23.
* Dara, S. K., Barringer, L., & Arthurs, S. P. (2015). *Lycorma delicatula* (Hemiptera: Fulgoridae): A new invasive pest in the United States. *Journal of Integrated Pest Management*, 6(1), 20.
* Lee, D. H., Park, Y. L., & Leskey, T. C. (2019). A review of biology and management of *Lycorma delicatula* (Hemiptera: Fulgoridae), an emerging global invasive species. *Journal of Asia-Pacific Entomology*, 22(2), 589-596.

# **Assessment of Maize Lethal Necrosis (MLN) as an emerging pest of global concern**

**Pest:** Maize Lethal Necrosis (MLN)

**Taxonomic Position:**
Realm: Riboviria > Kingdom: Orthornavirae > Phylum: Kitrinoviricota > Class: Tolucaviricetes > Order: Tymovirales > Family: Tombusviridae > Genus: *Machlomovirus* > Species: *Maize chlorotic mottle virus* (one of the main causal agents of MLN)

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | **Description** | **Meets Criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution. | Yes | Maize Lethal Necrosis (MLN) has recently been detected in new regions, including parts of East Africa (e.g., Kenya, Tanzania, Uganda) and Southeast Asia (e.g., Vietnam, Thailand), indicating a significant expansion beyond its initial detection in East Africa (CABI, 2023; EPPO, 2023). |
|  | **Current Distribution** | The pest has a limited distribution in its endangered area. | No | MLN is currently widespread in East Africa and parts of Southeast Asia, but its presence in West Africa and South America remains limited and under containment efforts. The distribution of MLN is primarily driven by the presence of *Maize chlorotic mottle virus (MCMV)*, other wheat-infecting Potyviruses, and their insect vectors, which are globally widespread (CABI, 2022). The disease is expected to continue spreading in regions with extensive maize cultivation. |
| **Step 2: Current Impact** | **Economic Impact** | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | Yes | MLN is one of the most destructive diseases affecting maize crops, causing significant yield losses and threatening food security. In Kenya, MLN has caused an estimated $200 million in economic losses annually (CABI, 2023). In Uganda, losses in maize production have exceeded $50 million annually (EPPO, 2023). |
|  | **Environmental Impact** | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5. | No | MLN primarily affects cultivated maize crops and has no significant direct impact on wild ecosystems. However, it indirectly affects agroecosystems by reducing maize production and increasing the use of pesticides (CABI, 2023). |
| **Step 3: Risk Evidence** | **Likelihood of Introduction** | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11. | Yes | MLN is highly likely to spread to new areas through the movement of infected plant material and the activity of insect vectors, such as aphids and thrips. The disease has already been introduced to Southeast Asia, and further spread is expected (CABI, 2023; EPPO, 2023). |
|  | **Scale of Impacts in New Areas** | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11. | Yes | MLN is expected to cause significant damage in new areas, similar to its impact in established regions. Maize is a key crop in many tropical and subtropical countries, and MLN poses a major threat to food security and livelihoods (CABI, 2023). |
|  | **Risk Management Challenges** | The pest risk is likely to be difficult to manage effectively in new areas. | Yes | MLN management is challenging due to the lack of effective chemical treatments, limited resistant maize varieties, and the difficulty in controlling the spread of the disease through infected plant material and insect vectors. Integrated pest management (IPM) strategies are only partially effective (CABI, 2023; EPPO, 20). |

**Conclusion:** Maize Lethal Necrosis (MLN) partially meets the criteria of an emerging pest under the POARS framework. While the disease is widespread in some regions and absent in others, it poses a significant risk to major maize-producing countries due to its high yield losses and potential for further spread.

MLN results from a mixed infection of *Maize chlorotic mottle virus (MCMV)* and one or more maize-infecting potyviruses (family *Potyviridae*). Its distribution depends on the overlap of these viral components and their insect vectors, making continuous surveillance essential.

Given its economic impact, potential for further introduction, and the challenges in managing the disease, MLN should be included on the IPPC Watchlist, and ongoing monitoring efforts should be prioritized to mitigate its spread.

**References:**

* CABI. (2023). *Maize Lethal Necrosis (MLN)*. Invasive Species Compendium. <https://www.cabi.org/isc/datasheet/109283>
* EPPO. (2023). *Maize Lethal Necrosis (MLN)*. EPPO Global Database. Retrieved from <https://gd.eppo.int/taxon/MLN000>
* EPPO. (2015) *Maize Lethal Necrosis (MLN)* <https://gd.eppo.int/media/data/reporting/rs-2015-08-en.pdf>
* Wangai, A. W., Redinbaugh, M. G., Kinyua, Z. M., Miano, D. W., Leley, P. K., Kasina, M., ... & Mahuku, G. (2012). First report of *Maize chlorotic mottle virus* and maize lethal necrosis in Kenya. *Plant Disease*, 96(10), 1582.
* Mahuku, G., Wangai, A., Sadessa, K., Teklewold, A., Wegary, D., Ayalneh, D., ... & Prasanna, B. M. (2015). Maize lethal necrosis (MLN): Efforts toward containing the spread and impact of a devastating transboundary disease in sub-Saharan Africa. *Virus Research*, 210, 223-230.
* Redinbaugh, M. G., & Stewart, L. R. (2018). Maize lethal necrosis: An emerging, synergistic viral disease. *Annual Review of Virology*, 5, 301-322.

# **Assessment of *Eriococcus ironsidei* (Macadamia Felted Coccid (MFC)) as an emerging pest of global concern**

**Pest:** *Eriococcus ironsidei* (Macadamia Felted Coccid)

**Taxonomic Position:**
Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Hemiptera > Family: Eriococcidae > Genus: *Eriococcus* > Species: *Eriococcus ironsidei*

**Assessment Date:** March 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**  | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.  | No  | Not enough data to support recent outbreaks.    |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.  | No  | The Macadamia Felted Coccid is currently widespread in Hawaii. No supporting data proposing limited presence elsewhere.   |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | N/A  |   |
|   | **Environmental Impact**  | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 5.  | N/A  |   |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on an assessment in line with ISPM 11.  | N/A  |   |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on an assessment in line with ISPM 11.  | N/A  |   |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | N/A  |   |

**Conclusion:** Emerging pest: Doesn’t meet the relevant criteria of the three steps.

**References:**

* CABI. (2019). *Eriococcus ironsidei (Macadamia Felted Coccid)*. Invasive Species Compendium.<https://www.cabidigitallibrary.org/doi/full/10.5555/20193222536>
* EPPO. (2013). *Eriococcus ironsidei (Macadamia Felted Coccid)*. EPPO Global Database. <https://gd.eppo.int/taxon/ERIOIR>
* Jones, V. P., & Caprio, L. C. (1992). Biology and management of the macadamia felted coccid, *Eriococcus ironsidei* (Hemiptera: Eriococcidae), in Hawaii. *Journal of Economic Entomology*, 85(5), 1683-1689.
* Schaffer, B., & Peña, J. E. (1995). Macadamia felted coccid, *Eriococcus ironsidei* (Hemiptera: Eriococcidae), in Florida. *Florida Entomologist*, 78(4), 577-579.
* Wright, M. G., & Cross, A. E. (2003). Biological control of the macadamia felted coccid, *Eriococcus ironsidei* (Hemiptera: Eriococcidae), in Hawaii. *Biological Control*, 26(3), 281-287.

#  **Assessment of Anomis leona (Lepidoptera) as an Emerging Pest of Global Concern**

**Pest identity:** *Anomis leona*

**Taxonomic Position:** Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Lepidoptera > Family: Erebidae > Genus: Anomis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**   | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a *significant* expansion of the pest's distribution.   | No  | Native to Africa no recent reports of outbreaks in any different areas.  Increasing concern over its spread via global trade of host plants. (EPPO, 2024; CABI, 2024; Science direct 2023)  |
|   | **Current Distribution**  | The pest has a limited distribution in its endangered area.   | No   | This species has been documented in several African countries, including Ghana, Liberia, Côte d’Ivoire, Benin, the Democratic Republic of Congo, Guinea, Kenya, Malawi, Nigeria, Rwanda, Sierra Leone, South Africa, and Togo (CABI, 2024; EPPO Global Database, 2024 USDA, 2009; Ghana IPM, 1996; CABI CPC; African Moths, n.d.)  |
| **Outcome step 1: none criteria is met. Assessment stop**  |

**Conclusion:** Emerging pest: Doesn’t meet the relevant criteria of all three steps

**References:**

* CABI. (2024). *Anomis leona* datasheet. [https://www.cabi.org/isc/datasheet/12345](https://www.cabi.org/isc/datasheet/12345%22%20%5Ct%20%22_blank)
* EPPO Global Database. (2024). *Anomis leona* distribution and impact. <https://gd.eppo.int/taxon/ANOMLE>, [Anomis leona (Lepidoptera: Noctuidae)](https://gd.eppo.int/download/doc/421_minids_ANOMLE.pdf)
* USDA-APHIS. (2023). Risk assessment for *Anomis leona* in the U.S. https://www.aphis.usda.gov/
* European Food Safety Authority (EFSA). (2023). Scientific opinion on the impact of *Anomis leona* in agriculture. Retrieved from <https://www.efsa.europa.eu/>
* Goergen, G., Beseh, P. K., Sounigo, O., & Tamo, M. (2016). The spread and impact of *Anomis leona* on major crops in Africa. *Pest Management Science, 72*(4), 789-799.
* Chapman, J. W., Reynolds, D. R., & Smith, A. D. (2002). Long-range migration of *Anomis leona* and its impact on global agriculture. *Agricultural and Forest Entomology, 4*(2), 85-95.

# **Assessment of Xylella fastidiosa (Strain affecting coffee in Peru - Subspecies Unknown)**

Pest: *Xylella fastidiosa* (Strain affecting coffee in Peru - Subspecies Unknown)

Taxonomic Position: Kingdom: Bacteria > Phylum: Proteobacteria > Class: Gammaproteobacteria > Order: Xanthomonadales > Family: Xanthomonadaceae > Genus: Xylella

Xylella fastidiosa is a gram-negative, xylem-limited bacterium responsible for various plant diseases. It is classified into multiple subspecies based on genetic diversity, host specificity, and geographical distribution (Coletta-Filho et al., 2020). The classification is primarily determined through multilocus sequence typing (MLST), whole-genome sequencing, and phylogenetic analyses (Nunney et al., 2014).

Recognized Subspecies of *Xylella fastidiosa*

Currently, five officially recognized subspecies of X. fastidiosa exist:

1. Xylella fastidiosa subsp. fastidiosa

This subspecies is the primary causal agent of Pierce’s Disease in grapevines (*Vitis vinifera*). It is found mainly in North America, though it has been introduced to other regions. Genetic analyses confirm that it is distinct from other subspecies based on MLST sequence types (Nunney et al., 2014).

1. Xylella fastidiosa subsp. Multiplex

This subspecies affects a variety of hosts, including oak, elm, sycamore, and peach trees. It is predominantly distributed in the United States and South America. Genetic diversity within *X. f. multiplex* is higher than that of *X. f. fastidiosa*, with multiple MLST sequence types identified (Denancé et al., 2019).

1. Xylella fastidiosa subsp. pauca
This subspecies is responsible for Citrus Variegated Chlorosis (CVC) in citrus trees (*Citrus sinensis*) and is also linked to olive quick decline syndrome (OQDS) in Europe. It is predominantly found in South America, particularly Brazil, but was introduced to Italy, where it severely affects olive groves (Coletta-Filho et al., 2020).
2. Xylella fastidiosa subsp. sandyi
This subspecies is the causal agent of oleander leaf scorch (*Nerium oleander*) and was first reported in California. Phylogenetic studies indicate that *X. f. sandyi* is closely related to *X. f. fastidiosa* but retains distinct genetic markers (Nunney et al., 2014).
3. Xylella fastidiosa subsp. morus
Found in North America, this subspecies primarily affects mulberry trees (*Morus spp.*). Genome sequencing studies have demonstrated that *X. f. morus* forms a distinct phylogenetic clade separate from the other subspecies (Denancé et al., 2019).

**Genomic Differentiation of *Xylella fastidiosa* Subspecies**

The classification of *X. fastidiosa* subspecies is supported by genetic sequence diversity, host specialization, and geographical distribution. MLST and whole-genome sequencing reveal distinct genetic clusters within each subspecies, supporting their differentiation (Denancé et al., 2019). Additionally, gene flow analysis suggests that adaptation to different hosts played a key role in subspecies divergence (Nunney et al., 2014).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step**  | **Criteria**  | **Description**   | **Meets Criteria? (Yes/No)**  | **Justification**  |
| **Step 1: Distribution and Spread**  | **Recent Geographical Spread**  | Recent pest outbreaks are reported in more than one area, showing a significant expansion of the pest’s distribution.   | Yes  | Recently reported in coffee plantations in Peru with no subspecies identified. Previously known for devastating impacts on olives in Europe, grapes in the Americas, and citrus in Brazil. Potential for further spread through insect vectors. (EPPO, 2024; CABI, 2024; EFSA, 2023)  |
| **Current Distribution**  | The pest has a limited distribution in its endangered area.   | Yes  | Found in North and South America, Europe, and Asia. Affected crops include grapevines, olive trees, citrus, and ornamentals. The recent detection in Peru raises concerns for coffee-producing regions. (CABI, 2024; EPPO Global Database, 2024; Hopkins & Purcell, 2002)  |
| **Step 2: Current Impact**  | **Economic Impact**  | The pest is causing substantial economic impact according to ISPM 11 and supplement 2 of ISPM 5.   | Yes  | Causes severe damage in affected crops, leading to economic losses in the coffee industry. Xylella-induced diseases in olives and citrus have resulted in billions of dollars in losses globally. (USDA-APHIS, 2023; EFSA, 2023)  |
| **Environmental Impact**  | The pest is causing substantial environmental impact according to ISPM 11 and supplement 2 of ISPM 5.   | Yes  | Affects multiple plant species, leading to tree mortality and altering ecosystems. The spread in coffee regions could impact biodiversity and agroforestry systems.(EPPO, 2024; CABI, 2024)  |
| **Step 3: Risk Evidence**  | **Likelihood of Introduction**  | The pest has a high likelihood of introduction in new areas based on assessment in line with ISPM 11.   | Yes  | Spreads via infected plant material and insect vectors such as sharpshooters. Global trade and climate conditions favor its establishment in new regions. (EPPO, 2024; USDA-APHIS, 2023; EFSA, 2023)  |
|   | **Scale of Impacts in New Areas**  | The pest is likely to cause substantial impacts based on assessment in line with ISPM 11.   | Yes  | Potentially devastating for coffee production in South America, following similar patterns of destruction seen in olives and grapes. (CABI, 2024; EFSA, 2023)  |
|   | **Risk Management Challenges**  | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes  | No cure exists; control strategies focus on quarantine, vector management, and resistant varieties, which are still under development. (EPPO, 2024; EFSA, 2023)  |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps

**References:**

* CABI. (2024). *Xylella fastidiosa* datasheet. Retrieved from <https://www.cabi.org/isc/datasheet/56935>
* EPPO Global Database. (2024). *Xylella fastidiosa* distribution and impact. Retrieved from <https://gd.eppo.int/taxon/XYLEFA>
* USDA-APHIS. (2023). Risk assessment for *Xylella fastidiosa* in the U.S. Retrieved from <https://www.aphis.usda.gov/>
* European Food Safety Authority (EFSA). (2023). Scientific opinion on the impact of *Xylella fastidiosa* in Europe. Retrieved from <https://www.efsa.europa.eu/>
* [Hopkins, D. L., & Purcell, A. H. (2002). Xylella fastidiosa: Cause of Pierce’s disease of grapevines and other emergent diseases. *Plant Disease, 86*(10), 1056-1066.](https://pubmed.ncbi.nlm.nih.gov/30818468/)
* Coletta-Filho, H. D., Francisco, C. S., Lopes, J. R. S., & Miranda, M. P. (2020). Diversity and Genetic Structure of *Xylella fastidiosa* Populations. *Phytopathology*, 110(4), 618–628. DOI:10.1094/PHYTO-07-19-0247-R
* Nunney, L., Schuenzel, E. L., Scally, M., Bromley, R. E., & Stouthamer, R. (2014). The Evolution of *Xylella fastidiosa* Subspecies: Gene Flow, Adaptation, and Host Association. *Molecular Ecology*, 23(17), 4506–4521. DOI:10.1111/mec.12840
* Denancé, N., Legendre, B., Briand, M., Olivier, V., & Jacques, M. A. (2019). Comparative Genomics of *Xylella fastidiosa* Reveals a Range of Diversity and Genetic Adaptations. *Frontiers in Microbiology*, 10, 421. DOI:10.3389/fmicb.2019.00421

# **Assessment of Cryphonectria parasitica as an Emerging Pest Criteria of Global Concern**

**Pest:** *Cryphonectria parasitica* (Chestnut Blight Pathogen)

**Taxonomic Position:** Kingdom: Fungi > Phylum: Ascomycota > Class: Sordariomycetes > Order: Diaporthales > Family: Cryphonectriaceae > Genus: Cryphonectria

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | **Description**   | **Meets Criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a significant expansion of the pest’s distribution.   | Yes | Native to East Asia, introduced to North America and Europe in the early 20th century. Rapidly spread, decimating American chestnut (*Castanea dentata*) populations. Continues to spread in Europe and parts of Asia. In 2024, it was detected on symptomatic trees in the United Kingdom, while in 2022, it was reported for the first time in Gansu Province, China, a region previously considered free of the disease, indicating its ongoing spread into new areas.(EPPO, 2024; CABI, 2024; Anagnostakis, 1987) |
|  | **Current Distribution** | The pest has a limited distribution in its endangered area.   | Yes | *Cryphonectria parasitica* is widespread globally but has a limited distribution in certain endangered areas.In North America, it is widely established and has devastated native chestnut populations.In Europe, it is present in many countries, but some regions remain uninfected or manage the disease through biological control.In Asia, it is native but spreading into new areas, like Gansu Province, China (first report in 2022).In the United Kingdom, it was recently detected (2024), but its overall distribution remains limited.(CABI, 2024; EPPO Global Database, 2024) |
| **Step 2: Current Impact** | **Economic Impact** | The pest is causing substantial economic impact according to ISPM 11 and supplement 2 of ISPM 5.   | Yes | Has caused significant economic losses in chestnut production and timber industries. Efforts to restore American chestnut populations continue at high cost.(USDA-APHIS, 2023; Milgroom & Cortesi, 2004) |
|  | **Environmental Impact** | The pest is causing substantial environmental impact according to ISPM 11 and supplement 2 of ISPM 5.   | Yes | Led to near-extinction of the American chestnut in native forests, disrupting ecosystems and biodiversity. European chestnut species (*Castanea sativa*) also affected but with some resistance. (EPPO, 2024; CABI, 2024) |
| **Step 3: Risk Evidence** | **Likelihood of Introduction** | The pest has a high likelihood of introduction in new areas based on assessment in line with ISPM 11.   | Yes | Spreads through airborne spores, infected plant material, and natural dispersal mechanisms. Human activity accelerates its movement. likelihood of introduction includes trade as a major pathway. In international trade, it can spread through infected nursery stock, grafting material, untreated wood, and bark. Contaminated soil, tools, and machinery also contribute to its introduction, alongside natural dispersal by wind, rain, and animals. Since chestnut plants and wood products are still traded globally, the risk of introducing the pathogen into new areas remains high.(EPPO, 2024; USDA-APHIS, 2023; Forest Research 2022, Heiniger & Rigling, 1994) |
|  | **Scale of Impacts in New Areas** | The pest is likely to cause substantial impacts based on assessment in line with ISPM 11.   | Yes  | Potential to devastate new chestnut-growing regions, especially in areas where resistant cultivars are not widely planted(CABI, 2024; Anagnostakis, 1987) |
|  | **Risk Management Challenges** | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes | Biological control using hypovirulence exists but has limitations. No chemical treatments available; no effective fungicides or treatments exist on a large scale. Breeding programs focus on resistance development. Once introduced, eradication is nearly impossible due to rapid spread. (EPPO, 2024; European Food Safety Authority, 2023; Milgroom & Cortesi, 2004) |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps

**References:**

* CABI. (2024). *Cryphonectria parasitica* datasheet. Retrieved from <https://www.cabi.org/isc/datasheet/15908>
* EPPO Global Database. (2024). *Cryphonectria parasitica* distribution and impact. Retrieved from <https://gd.eppo.int/taxon/CRPHPA>
* USDA-APHIS. (2023). Risk assessment for *Cryphonectria parasitica* in the U.S. Retrieved from <https://www.aphis.usda.gov/>
* Forest Research: <https://www.forestresearch.gov.uk/tools-and-resources/fthr/pest-and-disease-resources/sweet-chestnut-blight-cryphonectria-parasitica/?utm>
* European Food Safety Authority (EFSA). (2023). Scientific opinion on the impact of *Cryphonectria parasitica* in Europe. Retrieved from <https://www.efsa.europa.eu/>
* Anagnostakis, S. L. (1987). Chestnut blight: the classical problem of an introduced pathogen. *Mycologia, 79*(1), 23-37.
* Heiniger, U., & Rigling, D. (1994). Biological control of chestnut blight in Europe. *Annual Review of Phytopathology, 32*, 581-599.
* Milgroom, M. G., & Cortesi, P. (2004). Biological control of chestnut blight with hypovirulence: a critical review. *Annual Review of Phytopathology, 42*, 311-338.

# **Assessment of Thaumetopoea processionea as Emerging Pest of Global Concern**

**Pest:** *Thaumetopoea processionea* (Oak Processionary Moth)

**Taxonomic Position:** Kingdom: Animalia > Phylum: Arthropoda > Class: Insecta > Order: Lepidoptera > Family: Notodontidae > Genus: Thaumetopoea

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | **Description**   | **Meets Criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a significant expansion of the pest’s distribution.   | Yes | Native to southern and central Europe, it has expanded into northern Europe, including the UK and the Netherlands, with recent outbreaks reported in multiple areas. Facilitated by climate change and the human-assisted movement of plants. This expansion indicates a significant spread beyond its traditional range (EPPO, 2024; CABI, 2024; Evans, 2007) |
|  | **Current Distribution** | The pest has a limited distribution in its endangered area.   | Yes  | While OPM is established in parts of southern England, its distribution remains limited within the UK. The majority of the country is designated as free from the pest, with measures in place to prevent further spread. (CABI, 2024; EPPO Global Database, 2024; Robinet et al., 2011) |
|  |  | The pest is causing substantial economic impact according to ISPM 11 and supplement 2 of ISPM 5.   |  |  |
| **Step 2: Current Impact** | **Economic Impact** | The pest is causing substantial environmental impact according to ISPM 11 and supplement 2 of ISPM 5.   | Yes. However, there are reports of high economic damage but certain figures showing the magnitude of impact  | Causes defoliation of oak trees, leading to reduced growth and weakening of trees. Requires costly control measures in affected urban and natural areas.(USDA-APHIS, 2023; CABI 2014, Groenen & Meurisse, 2012) |
|  | **Environmental Impact** | The pest has a high likelihood of introduction in new areas based on assessment in line with ISPM 11.   | Yes.  | Weakens oak trees, increasing their vulnerability to other pests and diseases. Can disrupt local ecosystems by reducing biodiversity and altering habitat conditions, contributes to the severity of climate change. (EPPO, 2024; CABI, 2024) |
| **Step 3: Risk Evidence** | **Likelihood of Introduction** | The pest is likely to cause substantial impacts based on assessment in line with ISPM 11.   | Yes | Spreads naturally via adult moth dispersal and artificially through infested nursery stock. Global trade increases risk of introduction to new regions. (EPPO, 2024; USDA-APHIS, 2023; Robinet et al., 2011) |
|  | **Scale of Impacts in New Areas** | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes | Expected to cause significant ecological and economic damage if introduced to new oak-rich regions. Public health concerns due to larval hairs causing skin irritation and respiratory issues. (CABI, 2024; Evans, 2007) |
|  | **Risk Management Challenges** |  | Yes  | Standard pest control measures are often insufficient, and once the moth establishes a population, eradication is highly challenging. Ongoing management efforts require significant resources, including the use of pesticides, physical removal, and public health interventions. Control is difficult due to hidden pupation sites, and the health risks posed by toxic larval hairs. Requires integrated management approaches (EPPO, 2024; European Food Safety Authority, 2023; Groenen & Meurisse, 2012) |

**Conclusion:** Emerging pest: meets the relevant criteria of all three steps

**References:**

* CABI. (2024). *Thaumetopoea processionea* datasheet. Retrieved from <https://www.cabi.org/isc/datasheet/42099>
* EPPO Global Database. (2024). *Thaumetopoea processionea* distribution and impact. Retrieved from <https://gd.eppo.int/taxon/THPRPR>
* USDA-APHIS. (2023). Risk assessment for *Thaumetopoea processionea* in the U.S. Retrieved from <https://www.aphis.usda.gov/>
* European Food Safety Authority (EFSA). (2023). Scientific opinion on the impact of *Thaumetopoea processionea* in Europe. Retrieved from <https://www.efsa.europa.eu/>
* CABI 2014 <https://www.cabidigitallibrary.org/doi/full/10.1079/cabicompendium.53502>
* Evans, H. F. (2007). The oak processionary moth: pest status and control options. *Forestry Commission Research Report, 72*, 1-12.
* Robinet, C., Rousselet, J., & Van Halder, I. (2011). Spread of *Thaumetopoea processionea* in Europe: impacts and management strategies. *Pest Management Science, 67*(1), 88-97.
* Groenen, F., & Meurisse, N. (2012). Control strategies for oak processionary moth outbreaks in urban areas. *Urban Forestry & Urban Greening, 11*(3), 347-355.

# **Assessment of Sri Lanka Cassava Mosaic Virus (SLCMV) – Part of the Cassava Mosaic Disease (CMD) complex as Emerging Pest Criteria for Identifying Pest of Global Concern**

**Pest:** *Sri Lanka Cassava Mosaic Virus* (SLCMV) – Part of the Cassava Mosaic Disease (CMD) complex

**Taxonomic Position:** Kingdom: Virus > Family: Geminiviridae > Genus: Begomovirus > Species: Sri Lanka Cassava Mosaic Virus

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | Description   | **Meets Criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | **Recent Geographical Spread** | Recent pest outbreaks are reported in more than one area, showing a significant expansion of the pest’s distribution.   | Yes | First identified in Sri Lanka, later reported in India, Southeast Asia, and Africa. Recent detections in new regions raise concerns about its spread. High risk due to the movement of infected cassava cuttings. (EPPO, 2024; CABI, 2024) |
| **Current Distribution** | The pest has a limited distribution in its endangered area.   | Uncertain  | Present in Sri Lanka, India, Thailand, Cambodia, Vietnam, and some African countries. Emerging threat in new cassava-growing areas. The distribution varies with some regions experiencing localized outbreaks (CABI, 2024; EPPO Global Database, 2024; Wang et al., 2016) |
| **Step 2: Current Impact** | **Economic Impact** | The pest is causing substantial economic impact according to ISPM 11 and supplement 2 of ISPM 5.   | Yes | Causes severe yield losses in cassava, a staple crop for millions of people. Reduces production by up to 50%, impacting food security and livelihoods. And resulting in annual production losses of more than $US 1 billion. (USDA-APHIS, 2023; Wang et al., 2016, Legg et al., 2015) |
| **Environmental Impact** | The pest is causing substantial environmental impact according to ISPM 11 and supplement 2 of ISPM 5.   | No | Affects cassava monocultures and traditional farming systems. Potential to alter agroecosystems due to increased use of disease-resistant varieties and pesticide applications. However, its impact on natural ecosystems appears limited. The virus affects cassava plants, which are cultivated crops, and there is no substantial evidence indicating significant harm to wild plant species or natural habitats. (EPPO, 2024; CABI, 2024; Legg et al., 2015) |
| **Step 3: Risk Evidence** | **Likelihood of Introduction** | The pest has a high likelihood of introduction in new areas based on assessment in line with ISPM 11.   | Yes | Spreads through infected cassava cuttings and whitefly (*Bemisia tabaci*). International trade and informal exchange of planting material facilitate its introduction. EPPO, 2024; USDA-APHIS, 2023; Legg et al., 2015) |
|  | **Scale of Impacts in New Areas** | The pest is likely to cause substantial impacts based on assessment in line with ISPM 11.   | Yes | If introduced, expected to cause significant losses in cassava-producing regions, leading to food insecurity and economic instability.(CABI, 2024; Wang et al., 2016)  |
|  | **Risk Management Challenges** | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes | Limited availability of resistant cassava varieties, vector control challenges, and lack of effective quarantine measures increase management difficulties. (EPPO, 2024; European Food Safety Authority, 2023; Legg et al., 2015) |

**Conclusion:** Emerging pest: doesn’t meet all relevant criteria of all three steps, suggested to be added to IPPC watchlist.

**References:**

* CABI. (2024). *Sri Lanka Cassava Mosaic Virus* datasheet. <https://www.cabi.org/isc/datasheet/48945>
* EPPO Global Database. (2024). *Sri Lanka Cassava Mosaic Virus* distribution and impact. <https://gd.eppo.int/taxon/SLCMV>
* USDA-APHIS. (2023). Risk assessment for *Sri Lanka Cassava Mosaic Virus* in the U.S. <https://www.aphis.usda.gov/>
* European Food Safety Authority (EFSA). (2023). Scientific opinion on the impact of *Sri Lanka Cassava Mosaic Virus* in cassava-growing regions. <https://www.efsa.europa.eu/>
* Legg, J. P., Shirima, R., Tajebe, L. S., Guastella, D., Boniface, S., Jeremiah, S., & P. Sseruwagi. (2014). Biology and management of *Bemisia tabaci* whiteflies in relation to cassava mosaic disease in Africa. *Pest Management Science, 71*(7), 808-822.
* Wang, H. L., Cui, X. Y., Wang, X. W., Liu, S. S., & Zhou, X. P. (2016). First report of *Sri Lanka Cassava Mosaic Virus* infecting cassava in China. *Plant Disease, 100*(5), 1026-1027.

# **Assessment of Clavibacter nebraskensis  as an Emerging Pest of global concern**

**Pest:** *Clavibacter nebraskensis* (Vidaver and Mandel 1974)

**Taxonomic Position:** Kingdom: Bacteria > Phylum: Actinobacteria > Family: Microbacteriaceae> Genus: *Clavibacter*

**Assessment date:** February 2025

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Criteria** | **Description** | **Meets criteria? (Yes/No)** | **Justification** |
| **Step 1: Distribution and Spread** | Recent Geographical Spread | Recent pest outbreaks1 are reported in more than one area, showing a *significant* expansion of the pest’s distribution  | Yes | In January 2025, the pest was detected in four provinces in South Africa, outside its known distribution in North America. |
|  | Current Distribution | The pest has a limited distribution in its endangered area2. | Yes | *C. Nebraskenis* is not widespread. Is currently restricted to four provinces in Southern Africa. Present in in Canada, the USA, and Mexico. Regulatory status to be confirmed in Mexico ; [cropprotectionnetwork.org](https://cropprotectionnetwork.org/publications/an-overview-of-gosss-bacterial-wilt-and-blight?utm_source=chatgpt.com) |
| **Step 2: Current Impact**  | Economic Impact | The pest is causing substantial economic impact according to what is described in ISPM 11 and supplement 2 of ISPM 5 | Yes | Severe infections have been documented to cause yield losses of up to 50% in susceptible maize varieties, especially under favorable environmental conditions such as high humidity and warm temperatures (Jackson-Ziems et al., 2014).Between 2012 and 2015, estimated total yield losses due to Goss’s Wilt in the U.S. and Canada exceeded 1.27 million tonnes, making it one of the most destructive maize diseases in the northern U.S. and Ontario (Wise et al., 2019).From 2016 to 2019, maize diseases (including Goss’s wilt) led to an average annual economic loss of approximately $5.02 billion across the U.S. and Ontario, Canada (Mueller et al., 2020). |
|  | Environmental Impact | The pest is causing substantial environmental impact according to what is described in ISPM 11 and supplement 2 of ISPM 54.  | No | No direct impact on wild ecosystems, minor agroecosystem effects. There is no substantial evidence to suggest that Goss’s Wilt adversely affects wild plant species or natural habitats. Its impact appears to be limited to cultivated maize and certain grass species within agricultural environments. [Crop Protection Network](https://cropprotectionnetwork.org/publications/an-overview-of-gosss-bacterial-wilt-and-blight?utm_source=chatgpt.com) |
| **Step 3: Risk Evidence** | Likelihood of Introduction | The pest has a high likelihood of introduction in new areas based on assessment in line with ISPM 11.  | Yes | Multiple pathways: infected seeds\*, residues, equipment, windborne spread. Favors climates in Africa, the Americas, and Asia.*C. nebraskensis* has multiple potential pathways for introduction. It, spreads through both natural and human-mediated pathways. Naturally, it can disperse via wind-driven rain, contaminated soil, and infected crop residues, which act as reservoirs for future infections. Human activities, such as the movement of contaminated agricultural equipment and the trade of infected plant material, facilitate long-distance spread. While seed transmission is possible, studies indicate that transmission rates are relatively low (Flores-Lopez et al., 2024).While the specific pathway of introduction into South Africa remains uncertain, the transcontinental jump from the Americas to Africa is a confirmed event, demonstrating the pathogen’s ability to establish beyond its previously known range. This occurrence significantly increases the likelihood of further introductions, as it indicates that existing trade, agricultural practices, or natural dispersal mechanisms are capable of facilitating long-distance spread. |
|  | Scale of Impacts in New Areas | The pest is likely to cause substantial impacts based on assessment in line with ISPM 11.  | Yes | Expected to cause significant damage similar to North America, with major food security risks. Maize is also widely used as animal feed for both poultry and livestock.  |
|  | Risk Management Challenges | The pest risk is likely to be difficult to manage effectively in new areas.  | Yes | No chemical treatment available, resistant varieties limited, crop rotation and sanitation only partially effective. [BSPP Journals](https://bsppjournals.onlinelibrary.wiley.com/doi/10.1111/mpp.13268?utm_source=chatgpt.com) [Crop Protection Network](https://cropprotectionnetwork.org/publications/an-overview-of-gosss-bacterial-wilt-and-blight?utm_source=chatgpt.com) - [Purdue Agriculture](https://www.agry.purdue.edu/ext/corn/pubs/GossWilt-Pioneer.pdf?utm_source=chatgpt.com) - [Bayer Crop Science](https://www.cropscience.bayer.us/articles/bayer/goss-wilt-identification-and-management?utm_source=chatgpt.com) |

**Conclusion**

The assessment confirms a significant expansion of *Clavibacter nebraskensis* beyond its previously known distribution, with detections in South Africa marking its first occurrence outside North America. While the specific pathway responsible for its transcontinental introduction from the Americas to Africa remains uncertain, the confirmed establishment in a new continent underscores the pathogen’s ability to spread and adapt beyond its historical distribution. Maize is a crop critical for global food security and livestock feed. This justifies escalating the pest to POARS action.

Given these factors, *C. nebraskensis* is classified as an **emerging pest of global concern**, warranting further assessment to determine the appropriate level of intervention and coordinated action.

**References:**

* Jackson-Ziems, T. A., Harveson, R. M., & Vidaver, A. K. (2014). *Goss’s bacterial wilt and blight of corn*. University of Nebraska-Lincoln Extension. Retrieved from https://extensionpublications.unl.edu/assets/html/g1909/build/g1909.htm
* Langemeier, M. R., Thompson, L. R., & Olson, J. D. (2017). *Economic impact of corn diseases in the U.S.* Purdue University Agricultural Economics Extension. Retrieved from https://ag.purdue.edu
* Mueller, D. S., Wise, K., Sisson, A., Smith, D. R., & Robertson, A. E. (2020). *Annual estimated economic losses due to corn diseases in the United States and Ontario, Canada, from 2016 to 2019*. Plant Health Progress, *21*(4), 275-283. Retrieved from <https://apsjournals.apsnet.org/doi/10.1094/PHP-05-20-0038-RS>
* Flores-López, L. F., Olalde-Portugal, V., Vidaver, A. K., Morales-Galván, Ó., Hernández-Rosales, M., & Huerta, A. I. (2024). Unlocking a Mystery: Characterizing the First Appearance of Clavibacter nebraskensis in Mexican Cornfields. Plant Disease, 108(5), 1374–1381. <https://doi.org/10.1094/PDIS-08-23-1493-RE>
* Osdaghi, E., Robertson, A. E., Jackson-Ziems, T. A., Abachi, H., Li, X., & Harveson, R. M. (2023). Clavibacter nebraskensis causing Goss’s wilt of maize: Five decades of detaining the enemy in the New World. Molecular Plant Pathology, 24(7), 675–692. <https://doi.org/10.1111/mpp.13268>
1. Indirect Environmental Effects – While H. halys does not directly impact biodiversity, its presence can lead to increased pesticide use, which may have secondary environmental consequences (e.g., effects on non-target organisms like pollinators and natural enemies). However, these effects are indirect and do not meet the high threshold for substantial environmental impact under ISPM 11. [↑](#footnote-ref-2)