

California Pest Rating Proposal

Cydalima perspectalis (Walker): box tree moth

Lepidoptera: Crambidae

Current Rating: None

Proposed Rating: A

Comment Period: **09/07/2021 – 10/22/2021**

Initiating Event:

In April 2021, *Cydalima perspectalis* was found on boxwood plants at a nursery in Ontario, Canada (USDA Confirms Box Tree Moth and Takes Action to Contain and Eradicate the Pest). This species was known to be present in Ontario since 2018 (Canadian Food Inspection Agency). During the eight months prior to this detection, this nursery had shipped almost 2,000 boxwood plants to the eastern United States. It was possible that some of these plants may have been infested. Properties known to have received these plants in the United States were visited and plants suspected of being infested were destroyed. This pest could possibly have become established somewhere in the United States as a result of this incident. It has not been officially rated and therefore a pest rating proposal is needed.

History & Status:

Background: *Cydalima perspectalis* is a moth with a distinctive appearance as an adult. It has a wingspan of approximately 4 cm and has white wings with brown fringes (Canadian Food Inspection Agency). The larva feeds mostly on leaves of box trees (*Buxus* species). Other host plants in several additional genera and families are reported (e.g., *Eonymus*, *Ilex*, *Ligustrum*, and *Murraya* species), but many of these references are not available and it appears the level of damage to these other hosts may be minor. In addition, hosts other than *Buxus* species are not reported in Europe, where

C. perspectalis is introduced and widespread. The overwintering stage is the larva and pupation occurs between leaves. Multiple generations occur per year, apparently depending on climate; for example, three in the Republic of Macedonia and two in Germany (Göttig, 2017; Načeski et al., 2018). In Germany, Göttig (2017) reported the adults of the first generation to be active in June and July and those of the second generation to be active from August to October. Besides the number of generations, variation is also reported in the overwintering larval instar and even the number of instars in the larval stage.

The impact to box trees resulting from larval feeding is reported to be dramatic and to often result in complete defoliation. Severe impacts were reported in Slovakia, Switzerland, Turkey, (Akinci and Kurdoğlu, 2019; Kulfan et al., 2020; Leuthardt, 2013). The defoliation is reported to result in the death of trees (Nacambo et al., 2013). Besides defoliation, plants are also impacted by webbing and frass produced by the larvae (Canadian Food Inspection Agency).

Methods used to control *C. perspectalis* include insecticides, biological control, and pheromone traps (Plant et al., 2019). In laboratory and field experiments, *Bacillus thuringiensis* and *Beauveria bassiana* caused high mortality of *C. perspectalis* larvae (Burjanadze et al., 2019). A commercial lure is available.

Worldwide Distribution: The geographic origin of *C. perspectalis* is likely eastern Asia. It has been introduced to Asia (Turkey), Europe (including, but not limited to, Italy, Republic of Macedonia, Slovakia, Spain, Switzerland, and the United Kingdom), and North America (Canada) (Akinci and Kurdoğlu, 2019; Canadian Food Inspection Agency; Dincă et al., 2017; Kulfan et al., 2020; Leuthardt, 2013; Načeski et al., 2018; Plant et al., 2019; Raineri et al., 2017).

Official Control: *Cydalima perspectalis* is considered reportable by the United States Department of Agriculture (United States Department of Agriculture).

California Distribution: *Cydalima perspectalis* is not known to be established in California (California Department of Food and Agriculture).

California Interceptions: *Cydalima perspectalis* has not been intercepted in California (California Department of Food and Agriculture).

The risk *Cydalima perspectalis* poses to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** The main hosts of *C. perspectalis* are *Buxus* species. Although there are no native California species in this genus, *B. sempervirens* and *B. microphylla*, known hosts of the pest, are widely grown in California. *Cydalima perspectalis* is established in areas with a variety of climate, including relatively cool and temperate as well as Mediterranean. Much of California likely has a suitable climate. Therefore, *C. perspectalis* receives a **High (3)** in this category.
 - Low (1) Not likely to establish in California; or likely to establish in very limited areas.
 - Medium (2) may be able to establish in a larger but limited part of California.
 - **High (3) likely to establish a widespread distribution in California.**
- 2) **Known Pest Host Range:** The main hosts of *C. perspectalis* are *Buxus* species. The status of other plant genera as hosts does not appear to be strongly supported. Therefore, it receives a **Low (1)** in this category.
 - **Low (1) has a very limited host range.**
 - Medium (2) has a moderate host range.
 - High (3) has a wide host range.
- 3) **Pest Reproductive and Dispersal Potential:** *Cydalima perspectalis* could be moved with infested *Buxus* plants and it can fly. Therefore, it receives a **Medium (2)** in this category.

- Low (1) does not have high reproductive or dispersal potential.
- **Medium (2) has either high reproductive or dispersal potential.**
- High (3) has both high reproduction and dispersal potential.

4) **Economic Impact.** *Cydalima perspectalis* has a severe impact on Buxus trees and its presence in California could have an impact on nursery stock. It could also trigger quarantines by other states. Therefore, it receives a **High (3)** in this category.

Economic Impact: A, B, C

- A. The pest could lower crop yield.**
- B. The pest could lower crop value (includes increasing crop production costs).**
- C. The pest could trigger the loss of markets (includes quarantines).**
- D. The pest could negatively change normal cultural practices.
- E. The pest can vector, or is vectored, by another pestiferous organism.
- F. The organism is injurious or poisonous to agriculturally important animals.
- G. The organism can interfere with the delivery or supply of water for agricultural uses.

Economic Impact Score: High

- Low (1) causes 0 or 1 of these impacts.
- Medium (2) causes 2 of these impacts.
- **High (3) causes 3 or more of these impacts.**

5) **Environmental Impact.** There are no native *Buxus* species in California. However, infestations of *C. perspectalis* in ornamental plantings could trigger treatments. Therefore, *C. perspectalis* receives a **High (3)** in this category.

Environmental Impact: D, E

- A. The pest could have a significant environmental impact such as lowering biodiversity, disrupting natural communities, or changing ecosystem processes.
- B. The pest could directly affect threatened or endangered species.
- C. The pest could impact threatened or endangered species by disrupting critical habitats.
- D. The pest could trigger additional official or private treatment programs.**
- E. The pest significantly impacts cultural practices, home/urban gardening or ornamental plantings.**

Environmental Impact Score: High (3)

- Low (1) causes none of the above to occur.
- Medium (2) causes one of the above to occur.
- **High (3) causes two or more of the above to occur.**

Consequences of Introduction to California for *Cydalima perspectalis*: Medium (12)

Add up the total score and include it here.

- Low = 5-8 points
- Medium = 9-12 points**
- High = 13-15 points

6) Post Entry Distribution and Survey Information: *Cydalima perspectalis* is not known to be established in California. It receives a **Not established (0)** in this category.

- Not established (0) Pest never detected in California, or known only from incursions.**
- Low (-1) Pest has a localized distribution in California, or is established in one suitable climate/host area (region).
- Medium (-2) Pest is widespread in California but not fully established in the endangered area, or pest established in two contiguous suitable climate/host areas.

–High (-3) Pest has fully established in the endangered area, or pest is reported in more than two contiguous or non-contiguous suitable climate/host areas.

Final Score:

7) The final score is the consequences of introduction score minus the post entry distribution and survey information score: Medium (12)

Uncertainty:

There is some uncertainty regarding the potential of *C. perspectalis* to feed on plants other than *Buxus* species.

Conclusion and Rating Justification:

Cydalima perspectalis is a severe pest of box trees (*Buxus* species). These trees are widely grown in California. This pest is not known to occur in the United States. Its presence in California would likely have a significant impact on box trees planted in the state, and it could have trade impacts as well. For these reasons, an “A” rating is justified.

References:

Akinci, H. A. and Kurdoğlu, O. 2019. Damage level of *Cydalima perspectalis* (Lepidoptera: Crambidae) on naturally growing and ornamental box populations in Artvin, Turkey. Kastamonu University, Journal of Forestry Faculty 19:144-151.

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California Department of Food and Agriculture. Pest and damage record database. Accessed June 7, 2021:

<https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx>

Canadian Food Inspection Agency. *Cydalima perspectalis* (Walker) – (box tree moth) – fact sheet. Accessed July 23, 2021: <https://inspection.canada.ca/plant-health/plant-pests-invasive-species/insects/box-tree-moth/fact-sheet/eng/1552914498593/1552914498889>

Dincă, V., Viader, S., and Vila, R. 2017. Presence of the invasive *Cydalima perspectalis* (Walker, 1859) in the province of Barcelona (Lepidoptera: Crambidae). Butlletí Societat Catalana de Lepidopterologia 107:161-164.

Göttig, S. G. 2017. Development of eco-friendly methods for monitoring and regulating the box tree pyralid, *Cydalima perspectalis* (Lepidoptera: Crambidae), an invasive pest in ornamentals. Ph.D. dissertation, Technical University of Darmstadt, Darmstadt, Germany

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Leuthardt, F. L. G. 2013. Distribution, Life History, Food Choice and Chemical Ecology of the Invasive Box-Tree Pyralid *Cydalima perspectalis*. Ph.D. dissertation, University of Basel, Basel, Switzerland.

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Načeski, S., Papazova-Anakieva, I., Ivanov, B., Lazarevska, S., and Šurbevski, B. 2018. Occurrence of the new invasive insect *Cydalima perspectalis* Walker on box tree in the Republic of Macedonia. *Contributions, Section of Natural, Mathematical and Biotechnical Sciences, MASA* 39:135-141.

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USDA Confirms Box Tree Moth and Takes Action to Contain and Eradicate the Pest. Accessed July 23, 2021:

https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2021/sa-05/box-tree-moth

U.S. regulated plant pest table. Accessed June 7, 2021:

<https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/rppl/rppl-table>

Responsible Party:

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***Comment Period: 09/07/2021 – 10/22/2021**

***NOTE:**

You must be registered and logged in to post a comment. If you have registered and have not received the registration confirmation, please contact us at [permits\[@\]cdfa.ca.gov](mailto:permits[@]cdfa.ca.gov).

Comment Format:

- ❖ Comments should refer to the appropriate California Pest Rating Proposal Form subsection(s) being commented on, as shown below.

Example Comment:

Consequences of Introduction: 1. Climate/Host Interaction: [Your comment that relates to “Climate/Host Interaction” here.]

- ❖ Posted comments will not be able to be viewed immediately.

- ❖ Comments may not be posted if they:

Contain inappropriate language which is not germane to the pest rating proposal;

Contains defamatory, false, inaccurate, abusive, obscene, pornographic, sexually oriented, threatening, racially offensive, discriminatory or illegal material;

Violates agency regulations prohibiting sexual harassment or other forms of discrimination;

Violates agency regulations prohibiting workplace violence, including threats.

- ❖ Comments may be edited prior to posting to ensure they are entirely germane.
- ❖ Posted comments shall be those which have been approved in content and posted to the website to be viewed, not just submitted.

Proposed Pest Rating: A