CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

Agonopterix alstroemeriana (Clerck): a moth

Lepidoptera: Depressariidae

Current Rating: Q

Proposed Rating: D

Comment Period: 5/19/2021 – 7/3/2021

Initiating Event:

There is interest in distributing *Agonopterix alstroemeriana* in California for control of poison hemlock. It has not gone through the pest rating process. Therefore, a pest rating proposal is needed.

History & Status:

Background: The larvae of the moth *Agonopterix alstroemeriana* feed on the leaves of its only known host plant, *Conium maculatum* (poison hemlock) (Berenbaum, 1983; HOSTS). In Washington state, the larvae are present from early June to mid-July (Castell et al., 2005). The larvae are leaf-rollers. They can reach densities of hundreds of larvae per plant and defoliation of entire stands and death of plants are reported (Castells and Berenbaum, 2006). Poison hemlock is toxic to humans and livestock and is widespread in California. As one of the few insects known to feed on this plant, *A. alstroemeriana* is considered a biological control agent for it.

Worldwide Distribution: *Agonopterix alstroemeriana* is native to Europe and has been introduced to Canada and the United States, where it is established primarily in the northeast and Pacific Northwest. It was first reported in the United States in Tompkins County, New York in 1973 and was found in California, Oregon, and Utah in 1983 (Powell, 1991).

Official Control: *: Agonopterix alstroemeriana* is not known to be under official control anywhere.

California Distribution: *Agonopterix alstroemeriana* is widely distributed in northern and central California. There are official records from Alameda, Contra Costa, Mendocino, Napa, San Benito, Santa Cruz, Solano, Sonoma, and Siskiyou counties (California Department of Food and Agriculture).

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

The risk *Agonopterix alstroemeriana* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Agonopterix alstroemeriana* appears to be a temperate species. Its host plant, poison hemlock, is widely distributed in California except for the desert (Calflora). It seems likely that *A. alstroemeriana* could establish over a large proportion of California. Therefore, it 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:** *Agonopterix alstroemeriana* is only know to feed on one host plant species. 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:** *Agonopterix alstroemeriana* 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**. The only known host plant, poison hemlock, is not of significant economic value. This moth has been established in California since the 1980s and no reports were found of any economic impacts. Therefore, it receives a **Low (1)** in this category.

Economic Impact:

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: Low

– 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**. *Agonopterix alstroemeriana* is only known to feed on one host plant, poison hemlock, which is considered an invasive weed. This moth has been established in California since the 1980s and no reports were found of any environmental impacts or pest impacts. Therefore, *A. hartii* receives a **Low (1)** in this category.

Environmental Impact:

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: Low (1)

– 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 *Aspidiella hartii*: Low (8)

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:** *Agonopterix alstroemeriana* is widely distributed in California but may not be present in southern California. It receives a **Medium (-2)** 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: Low (6)

Uncertainty:

There appears to be very little uncertainty with this proposal. A formal host specificity test does not appear to have been done, but this moth is widely distributed and no records were found of feeding on any plant other than poison hemlock. Therefore, there is very little uncertainty regarding its potential negative impacts. It is not known how significant an impact this moth has had on poison hemlock in California or elsewhere.

Conclusion and Rating Justification:

Agonopterix alstroemeriana is a monophagous moth that feeds on poison hemlock, an invasive weed. It is already widely distributed in California and appears to have no potential for negative economic or environmental impacts. For these reasons, a "D" rating is justified.

References:

Berenbaum, M. 1983. Notes on the biology of *Agonopterix alstroemeriana* (Clerck), with descriptions of the immature stages (Oecophoridae). Journal of the Lepidopterists' Society 37:38-45.

Calflora. Accessed April 30, 2021: https://www.calflora.org/

California Department of Food and Agriculture. Pest and damage record database. Accessed April 30, 2021:
https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx

Castells, E. and Berenbaum, M. R. 2006. Laboratory rearing of *Agonopterix alstroemeriana*, the defoliating poison hemlock (*Conium maculatum* L.) moth, and the effects of piperidine alkaloids on preference and performance. Environmental Entomology 35:607-615.

Castells, E., Berhow, M. A., Vaughn, S. F., Berenbaum, M. R. 2005. Geographic variation in alkaloid production in *Conium maculatum* populations experiencing differential herbivory by *Agonopterix alstroemeriana*. Journal of Chemical Ecology 31:1693-1709.

HOSTS. Accessed April 30, 2021:
https://www.nhm.ac.uk/our-science/data/hostplants/

Powell, J. A. 1991. Rapid colonization of the western United States by the Palearctic moth, *Agonopterix alstroemeriana* (Oecophoridae). Journal of the Lepidopterists' Society 45:234-236.

Responsible Party:

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*Comment Period: 5/19/2021 – 7/3/2021

*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.

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: D