CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

***Arcola malloi* (Pastrana): Alligatorweed stem borer moth**

Lepidoptera: Pyralidae

Current Rating: Q

Proposed Rating: D

Comment Period: 09/27/2019 through 11/11/2019

Initiating Event:

An application was submitted for the purpose of releasing *A. malloi* in California for the control of alligatorweed.

History & Status:

Background: *Arcola malloi*, previously known as *Vogtia malloi*, is native to South America. It was released as a biological agent to control alligatorweed in the United States in the 1970s and in California in 1976. It is now established in the southeastern United States. The adult moth has a wingspan of approximately 30 mm. The female lays eggs on leaves and newly-hatched larvae tunnel into the stems. (Buckingham, 1996). Pupation occurs inside the plant.

Arcola malloi attack aquatic and terrestrial alligatorweed stems, which turn yellow and die, and heavily damaged mats eventually rot and sink (Brown and Spencer, 1973).

Field observations of 51 species of plants in the native habitat of *A. malloi* in Argentina, including seven species of Amaranthaceae (*besides A. philoxeroides*) and 26 species of Chenopodiaceae, did not reveal feeding damage by *A. malloi* on any except *A. philoxeroides* (Maddox and Hennessey, 1970). The host range of *A. malloi* was studied by Maddox and Hennessey (1970). They tested the ability of this moth to feed on 30 species of plants in six families. Full development was restricted to

the tribe Gomphrenae, although there was moderate feeding on other Amaranthaceae and two species of Chenopodiaceae. In South America, *A. malloi* was reared from *Alternanthera hassleriana* and possibly *Philoxerus portulacoides* (Maddox and Hennessey, 1970), and it was found to develop on *Blutaparon vermiculare* in the southeastern United States. This suggests a very narrow host range for *A. malloi*. *Arcola malloi* has not been reported to cause economic or environmental damage in the United States.

Worldwide Distribution: *Arcola malloi* is native to South America and reported to be found over most of the area occupied by alligatorweed, from La Plata, Argentina in the south to Georgetown, Guyana in the north (Brown, 1973). It is currently established in the southeastern United States (Alabama, Texas, Arkansas, North Carolina, Louisiana, and Mississippi) (Buckingham, 2018).

Official Control: *Arcola malloi* is not listed as a harmful organism by any states or nations and it is not known to be under official control anywhere.

California Distribution: *Arcola malloi* was released as a biological agent to control alligatorweed in southern California, but the site was later destroyed and *A. malloi* is not currently known to be established in California (Richmond, 1977).

California Interceptions: *Arcola malloi* has never been intercepted in California (California Department of Food and Agriculture).

The risk *Arcola malloi* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** The distribution of *Arcola malloi* is largely restricted to areas with a tropical or subtropical climate. It is possible that it could become established in a limited portion of California, for

example, wetlands in the southern portion of the state. Therefore, *Arcola malloi* receives a **Low (1)** 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 evidence found in literature suggests that *Arcola malloi* is limited to the subfamily Gomphrenoideae of the Amaranthaceae. 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:** *Arcola malloi* 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:** *Arcola malloi* is only known to feed on the Gomphrenoideae subfamily of the Amaranthaceae. There are no important crop or ornamental plants in this subfamily in California. 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**. The only native California plants in the subfamily Gomphrenoideae are in the genus *Tidestromia*. These plants occur in arid regions, and *Arcola malloi* is not expected to become established in these areas. Arcola malloi is not expected to have any significant environmental impacts. Therefore, it receives a **low (1)** in this category.

Evaluate the environmental impact of the pest on California using the criteria below.

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: 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 *Arcola malloi:* Low (6)

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:** *Arcola malloi* is presumed not to be established in California. It has not been reported in the state after the release site was destroyed. 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: **Low (6)**

Uncertainty:

There is little information available on this species and no official survey been done in California. It is possible this moth may be present in California. It is possible that the *Arcola malloi* could have a wider

host range than has been reported. If this is the case, its establishment in the state could have greater consequences than what is considered in this proposal.

Conclusion and Rating Justification:

Arcola malloi was previously released in California for the control of alligatorweed, but it is presumed to no longer be present in the state. No economic or environmental impacts have been attributed to this moth, and its release in California could benefit the state through control of alligatorweed. Based on the score listed above, *Arcola malloi* is low risk. A "D" rating is recommended.

References:

Brown, J. L. 1973. *Vogtia malloi*, a newly introduced pyralid (Lepidoptera) for the control of alligatorweed in the United States. Ph.D. dissertation. University of Florida.

Brown, J. L. and Spencer, N. R. 1973. *Vogtia malloi*, a newly introduced phycitine moth (Lepidoptera: Pyralidae) to control alligatorweed. Environmental Entomology 2: 519-523.

Buckingham, G. R. 1996. Biological control of alligatorweed, *Alternanthera philoxeroides*, the world's first aquatic weed success story. Castanea 61: 231-243.

Buckingham, G. R. 2018 Alligatorweed. Accessed July 5, 2019:
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California Department of Food and Agriculture. Pest and damage record database. Accessed July 5, 2019:
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Maddox, D. M. and Hennessey, R. D. 1970. The biology and host range of *Vogtia malloi* Pastrana. United States Department of Agriculture, Agricultural Research Service, Entomology Research Division Report. U.S. Government Printing Office.

Richmond, C. A. 1977. *Vogtia malloi*. A biological control on alligatorweed. Thesis. California State Polytechnic University.

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***Comment Period: 09/27/2019 through 11/11/2019**

***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 plant.health[@]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