CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

***Harrisina metallica* Stretch: western grapeleaf skeletonizer**

Synonym: Harrisina brillians Barnes and McDunnough

Lepidoptera: Zygaenidae

Current Rating: C

Proposed Rating: C

Comment Period: 06/01/2022 – 07/16/2022

Initiating Event:

Harrisina metallica has been present in California since the 1940s. However, it has not been through the new pest rating process and a pest rating proposal is needed.

History & Status:

Background: The adult *Harrisina metallica*, or the western grapeleaf skeletonizer, is a metallic blue to green moth. The larvae are also distinctive in appearance; older instars are yellow with black bands. The eggs are laid on grape leaves. The gregarious larvae feed on the lower surfaces of the leaves in early instars; older larvae continue to feed in groups and consume the entire leaf except for veins, and they can feed on fruit as well (Clausen, 1961). Reported host plants are all in the family Vitaceae and include *Vitis* spp. (including *V. vinifera* and wild grapevines) and *Parthenocissus* spp. (HOSTS – a database of the world's lepidopteran hostplants). There are reportedly two or three generations per year in California (Clausen, 1961). This pest is capable of causing complete defoliation of grapevines. Impacts include loss of leaves, sunburned fruit, and loss of fruit when they are fed upon by older larvae (Mayse and Carr, 1990).

After it was first found in California in 1941, *H*. *metallica* soon became a significant pest and grape crop losses of up to 90 were reported in some vineyards (Clausen, 1961). Eradication was attempted in the 1940s, but eventually this was given up.

A braconid wasp and tachinid fly were introduced in an effort to control this pest. In addition, an apparently unintentionally-introduced virus (apparently Harrisina brillians granulovirus, or HbGV) was reported to kill off heavy *H*. *metallica* infestations (Clausen, 1961). All three of these agents are capable of inflicting heavy mortality on *H*. *metallica* (Clausen, 1961). HbGV causes high levels of mortality in vineyards in Fresno and Madera counties (Stark et al., 1999). There is clearly some level of control of *H*. *metallica* in California by natural enemies.

Dara et al. (2019) report that it has not been a problem in conventional vineyards in California, but that it is sometimes a significant pest in organic and backyard grapevines.

A wide variety of control options are available for this pest, including *Bacillus thuringiensis* and Spinosad for organic situations (Western grapeleaf skeletonizer).

As of May 2022, Mendocino, Napa, Nevada, and Sonoma counties have ordinances against *H*. *metallica* (Western grape-leaf skeletonizer).

Worldwide Distribution: *Harrisina metallica* is native to the southwestern United States (Arizona, New Mexico, Texas, Utah, and Colorado) and northern Mexico. It was introduced to California (Clausen, 1961).

Official Control: *Harrisina metallica* is not known to be under official control anywhere.

California Distribution: *Harrisina metallica* was first found in California in San Diego County in 1941 (Clausen, 1961). It has spread and is now known to be present in at least 30 counties: Alameda, Amador, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Los Angeles, Marin, Mendocino, Napa, Nevada,

Orange, Placer, Riverside, Sacramento, San Bernardino, San Diego, San Joaquin, San Luis Obispo, Santa Barbara, Santa Clara, Shasta, Siskiyou, Sonoma, Stanislaus, Tulare, Ventura, and Yolo counties (California Department of Food and Agriculture; Essig museum of entomology collections).

California Interceptions: *Harrisina metallica* has apparently not been intercepted in California on material from outside of the state (California Department of Food and Agriculture).

The risk *Harrisina metallica* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This moth is widely established across California. Its host plants, including cultivated and wild grapevines, occur widely in the state. 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:** *Harrisina metallica* is known to feed on plants in one family, Vitaceae. 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:** *Harrisia metallica* could be moved with infested grapevines and bunches of grapes (older larvae can feed on grapes). The adults 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:** *Harrisina metallica* is a significant pest of grapevines that causes decreased yield and increased production costs. Therefore, it receives a **Medium (2)** in this category.

Economic Impact: A, B

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:Medium

– 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:** *Harrisia metallica* is known to be a pest in backyard grapevines. It feeds on wild grapevines and significant defoliation could impact natural communities. Infestations are likely to trigger treatments. Therefore, *H. metallica* receives a **High (3)** in this category.

Environmental Impact: A, 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 *Harrisina metallica*: Medium (11)

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:** *Harrisina metallica* is widely distributed across the state (at least 30 counties). It receives a **High (-3)** 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 (8)

Uncertainty:

Harrisina metallica has already spread throughout most of the state of California, including the major grape-growing areas. There is low uncertainty with this proposal.

Conclusion and Rating Justification:

Harrisina metallica is a grape pest that has been established in California since at least 1941 and it is now widespread in the state. For these reasons, a "C" rating is justified. This does not affect the county ordinances that currently exist against this pest.

References:

California Department of Food and Agriculture. Pest and damage record database. Accessed April 26, 2022:
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Clausen, C. P. 1961. Biological control of western grape leaf skeletonizer (*Harrisina brillians* B and McD) in California. Hilgardia 31:613-638.

Dara, S. K., Dara, S. S., Jaronski, S. 2019. Controlling the western grapeleaf skeletonizer with biorational products and California isolate of entomopathogenic fungi. CAPCA Adviser April 2019:46-48.

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https://essigdb.berkeley.edu/

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Mayse, M. A. and Carr, Jr., W. C. 1990. Alternative chemical control of western grapeleaf skeletonizer on grapes in central California. Viticulture and Enology Research Center Research Bulletin February 1990:1-2.

Stark, D. M., Purcell, A. H., and Mills, N. J. 1999. Natural occurrence of *Ametadoria misella* (Diptera: Tachinidae) and the granulovirus of *Harrisina brillians* (Lepidoptera: Zygaenidae) in California. Environmental Entomology 28:868-875.
Western grapeleaf skeletonizer. Accessed May 25, 2022: https://www2.ipm.ucanr.edu/agriculture/grape/western-grapeleaf-skeletonizer/

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Responsible Party:

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***Comment Period: 06/01/2022 – 07/16/2022**

***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: C