California Pest Rating Proposal

Graphocephala versuta **(Say): versute sharpshooter**

Hemiptera: Cicadellidae

Current Rating: Q

Proposed Rating: B

Comment Period: 06/20/2022 – 08/04/2022

Initiating Event:

Graphocephala versuta has been present in California since 2003. It has not been through the new pest rating process and a pest rating proposal is needed.

History & Status:

Background: *Graphocephala versuta* is a polyphagous leafhopper native to North America, including the southeastern United States. Reported hosts (including plants that this leafhopper has been captured or found on in large numbers as well as plants that have been infected by *Xylella fastidiosa* in experiments, which is an indication of feeding) include: **Cannabaceae:** *Cannabis sativa*; **Ulmaceae:** *Ulmus* sp.; **Fagaceae:** *Quercus* spp.; **Malvaceae:** *Gossypium* sp. (cotton); **Rutaceae:** *Citrus* sp.; **Vitaceae:** *Vitis vinifera* (Bentz and Townsend, 2005; Ewing and McGarr, 1933; Lago and Stanford, 1989; Lauzière et al., 2008; Ma et al., 2010; Overall and Rebek, 2015; Zhang et al., 2011). It has been reported to be the most abundant cicadellid in vineyards in Oklahoma, on oaks in New Jersey, and on cannabis in Mississippi (Lago and Stanford, 1989; Overall and Rebek, 2015; Zhang et al., 2011). There is apparently one generation per year (Overall and Rebek, 2015).

No reports were found of *G. versuta* having direct impacts on host plants through feeding. In an experiment, Ewing and McGarr (1933) did not find any feeding-related impacts of *G. versuta* on

cotton. Impacts from *G. versuta* have not been reported in southern California where it occurs (G. Arakelian, pers. comm.).

Graphocephala versuta is a known vector of *Xylella fastidiosa*. In experiments, it was shown to vector *X. fastidiosa* to grapes, alfalfa, and ragweed (Myers et al., 2007; Overall and Rebek, 2015).   Twenty percent of *G. versuta* from oaks in New Jersey and two percent of *G. versuta* in Oklahoma vineyards tested positive for the bacterium (Overall and Rebek, 2010; Zhang et al., 2011). Ma et al. (2010) hypothesized that *G. versuta* may be the most important vector of *X. fastidiosa* to peach in two counties in Alabama.

Worldwide Distribution: *Graphocephala versuta* is native to North America (including the southeastern United States) and possibly Central America as well. It is reported from North America: United States (including Alabama, Florida, Louisiana, Maryland, Mississippi, New Jersey, North Carolina, Oklahoma, Texas; **Central America:** Costa Rica (Ball, 1979; Ewing and McGarr, 1933 Garrita-Cambronero et al., 2008; Lago and Stanford, 1989; Lauzière et al., 2008; Ma et al., 2010; Myers et al., 2007; Nielson, 1968; Overall and Rebek, 2015; Zhang et al., 2011).

Official Control: *Graphocephala versuta* is considered an A1 pest in the European Union (EPPO global database).

California Distribution: *Graphocephala versuta* has been found in Los Angeles and Orange counties. Citizen scientist reports on the web site iNaturalist suggest it is present in San Diego County as well (iNaturalist).

California Interceptions: *Graphocephala versuta* has apparently not been intercepted in California (California Department of Food and Agriculture).

The risk *Graphocephala versuta* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This leafhopper is widely distributed in the eastern United States. It is already established in southern California, and is wide distribution in eastern states suggests it could establish further north in California. Its host plants, including grape, 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:** *Graphocephala versuta* is polyphagous. Therefore, it receives a **High (3)** 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:** *Graphocephala versuta* 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:** *Graphocephala versuta* is not reported to cause direct impacts through its feeding. However, it is a known vector of *Xylella fastidiosa*, which affects many crops including grapes and stone fruit. As an additional vector of this bacterium, this leafhopper could decrease

yield and increase production costs in California. This leafhopper is regulated by the European Union. Therefore, it receives a **High (3)** in this category.

Economic Impact: A, B, C, E

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:** *Graphocephala versuta* could trigger treatments and impact gardens (for example, backyard grapevines). It is a known vector of the subspecies of *Xylella fastidiosa* that causes oak leaf scorch (*X. f. multiplex*), so street plantings could be impacted. Therefore, *G. versuta* 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 *Graphocephala versuta*: High (14)

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:** *Graphocephala versuta* is known to be established in Los Angeles and Orange counties. It receives a **Low (-1)** 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: High (13)

Uncertainty:

Graphocephala versuta is known to have been established in California for approximately 20 years. It has not spread significantly north, or into the Central Valley. It is possible that it may not be able to establish over significantly greater area in California than it already has. If that is the case, then there is little further risk to California from this pest.

Conclusion and Rating Justification:

Graphocephala versuta is a leafhopper that vectors *Xyllella fastidiosa*, the causative agent of Pierce's disease in grape and a number of other diseases in other plants. It has the potential to impact grapes and other crops as well as street trees. It is currently restricted to coastal southern California. For these reasons, a "B" rating is justified.

References:

Bentz, J. and Townsend, A. M. 2005. Variation in leafhopper species abundance and diversity among elm seedlings and cultivars. HortScience 40:1389-1393.

California Department of Food and Agriculture. Pest and damage record database. Accessed April 26, 2022:
https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx

EPPO global database. Accessed May 26, 2022:
https://gd.eppo.int/

Ewing, K. P. and McGarr, R. L. 1933. The effect of certain homopterous insects as compared with three common mirids upon the growth and fruiting of cotton plants. Journal of Economic Entomology 26:943-953.

Garita-Cambronero, J., Villalobos, W., Godoy, C., and Rivera, C. 2008. Diversidad de cicadélidos y clastoptéridos (Hemiptera) en tres zonas productoras de café afectadas por *Xylella fastidiosa* Wells et al. en Costa Rica. Neotropical Entomology 37:436-448.

iNaturalist. Accessed May 26, 2022:
https://www.inaturalist.org/

Lago, P. K. and Stanford, D. F. 1989. Phytophagous insects associated with cultivated marijuana, *Cannabis sativa*, in northern Mississippi. Journal of Entomological Science 24:437-445.

Lauzière, I., Sheather, S., and Mitchell, F. 2008. Fluid-feeding Hemiptera in vineyards of central Texas and surrounding habitats. Environmental Entomology 37:925-937.

Ma, X., Coneva, E., Fadamiro, H., Murphy, J. F., Ray, C., and Dane, F. 2010. Seasonal occurrence and abundance of sharpshooter leafhoppers in Alabama orchards and vineyards. International Journal of Fruit Science 10:341-354.

Myers, A. L., Sutton, T. B., Abad, J. A., and Kennedy, G. G. 2007. Pierce's disease of grapevines: Identification of the primary vectors in North Carolina. Phytopathology 97:1440-1450.

Nielson, M. W. 1968. The leafhopper vectors of phytopathogenic viruses (Homoptera, Cicadellidae) taxonomy, biology, and virus transmission. United States Department of Agriculture Agricultural Research Service Technical Bulletin 1382:1-386.

Overall, L. M. and Rebek, E. J. 2015. Seasonal abundance and natural inoculativity of insect vectors of *Xylella fastidiosa* in Oklahoma tree nurseries and vineyards. Journal of Economic Entomology 108:2536-2545.

Zhang, J., Lashomb, J., Gould, A., and Hamilton, G. 2011. Cicadomorpha insects associated with bacterial leaf scorch infected oak in central New Jersey. Environmental Entomology 40:1131-1143.

Responsible Party:

Kyle Beucke, 1220 N Street, Sacramento, CA 95814, 916-698-3034, permits[@]cdfa.ca.gov

*Comment Period: 06/20/2022 – 08/04/2022

*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.]

❖ 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: B