CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

Anthonomus rubi (Herbst): strawberry blossom weevil

Coleoptera: Curculionidae

Current Rating: None

Proposed Rating: A

Comment Period: 09/15/2021 – 10/30/2021

Initiating Event:

Anthonomus rubi was found in the Vancouver area of British Columbia, Canada in 2019. Some finds occurred less than a mile from the United States border. This pest has not been rated and a pest rating proposal is needed.

History & Status:

Background: *Anthonomus rubi* is a small (2.5-3 mm in length) weevil that is shining and black with a covering of hair-like white scales (Franklin et al., 2021). It is reported to feed on raspberries, strawberries, and blackberries (*Fragaria* and *Rubus* species, including cultivated raspberries, blackberries, and strawberries as well as (based on presence on these plants) the native (to western North America) salmonberries (*Rubus spectabilis*) and thimbleberry (*Rubus parvifloris*), suggesting that these are hosts as well (Franklin et al., 2021). The adult female lays eggs inside the flower bud, in the process "severing" it (damaging it and preventing further development of it). Larvae feed on pollen in the bud (Franklin et al., 2021). This damage prevents the formation of fruit. In experiments, Jay et al. (2008) found that a single female *A. rubi* could sever 39.5 strawberry flowers in a year. There is apparently one generation per year. 33-54% of buds of Himalayan blackberry were found to be infested at one site in British Columbia (Franklin et al., 2021). In Serbia, up to 38%

of raspberry buds were damaged (Stamenković et al., 2010). In Estonia, up to 28% of strawberry flowers were damaged, but damage varied greatly by cultivar (Arus et al., 2008).
In a study in Poland, a variety of insecticides were found to be effective, including deltamethrin (Łabanowska, 2002). Cross et al. (2006) found a combination of grandlure I, grandlure II, and lavandulol to be attractive to *A. rubi*.

Worldwide Distribution: North America: Canada (British Columbia); Europe: Austria, Belgium, Denmark, Estonia, Finland, Italy, Poland, Russian Federation, Serbia, Sweden, Switzerland (Arus et al., 2008; CABI Invasive Species Compendium; Franklin et al., 2021; Stamenković et al., 2010). *Anthonomus rubi* was found in the Vancouver area of British Columbia, Canada in 2019 (Franklin et al., 2021). Some finds occurred less than one mile from the border, and it appears likely that this weevil will be established in Washington state if it is not already.

Official Control: *Anthonomus rubi* is considered an A 1 pest in Chile and Southern Africa (EPPO Global Database).

California Distribution: *Anthonomus rubi* is not known to be in California (CDFA).

California Interceptions: *Anthonomus rubi* has not been intercepted in California (CDFA).

The risk *Anthonomus rubi* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Anthonomus rubi* feeds on crops and wild plants that occur widely in California. Its known distribution appears mostly limited to cooler areas, so it seems likely that its potential distribution in California may be limited to northern and central regions. Therefore, *A. rubi* receives a **Medium (2)** 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:** *Anthonomus rubi* is only known to feed on plants in the family Rosaceae. 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:** *Anthonomus rubi* can presumably 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**. *Anthonomus rubi* is reported to be a significant pest of berries, including strawberries, which are an important crop in California. Oviposition apparently generally results in loss of floral development and therefore any fruit yield of the affected bud. Infestations could also increase 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**. *Anthonomus rubi* could impact berry plantings in residential areas and it could trigger treatments. Two known host plants, *Rubus spectabilis* and *R. parvifloris*, are native to California and widespread in coastal and higher-elevation areas. These plants could be impacted if *A. rubi* became established in California. Therefore, *A. rubi* 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 *Anthonomus rubi*: Medium (10)

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:** *Anthonomus rubi* 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 (10)

Uncertainty:

The records of *Anthonomus rubi* on *Rubus* species native to California may not indicate that these are reproductive hosts. This pest could already be present in California. It is possible that the climate in California's strawberry-growing areas could be too warm and dry for this pest.

Conclusion and Rating Justification:

Anthonomus rubi is a pest of berries that poses a threat to California's berry (including strawberry) industry and native *Rubus* species. It is not known to be established in California. For these reasons, an "A" rating is justified.

References:

Arus, L., Luik, A., Libek, A., and Olep, K. 2008. The damage of the strawberry blossom weevil (*Anthonomus rubi*) depending on raspberry cultivars and mulching in Estonia. Proceedings of international scientific conference "Sustainable fruit growing: From plant to product." May 28-31, 2008 Jūrmala - Dobele, Latvia 244-249.

CABI Invasive Species Compendium. Accessed August 27, 2021: https://www.cabi.org/isc/datasheet/5746

California Department of Food and Agriculture. Pest and damage record database. Accessed August 26, 2021: https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx

Cross, J. V., Hesketh, H., Jay, C. N., Hall, D. R., Innocenzi, P. J., Farman, D. I., and Burgess, C. M. 2006. Exploiting the aggregation pheromone of strawberry blossom weevil *Anthonomus rubi* Herbst (Coleoptera: Curculionidae): Part I. Development of lure and trap. Crop Protection 25:144-154.

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Franklin, M. T., Hueppelsheuser, T. K., Abram, P. K., Bouchard, P., Anderson, R. S., and Gibson, G. A. P. 2021. The Eurasian strawberry blossom weevil, *Anthonomus rubi* (Herbst, 1795), is established in North America. The Canadian Entomologist https://doi.org/10.4039/tce.2021.28.

Jay, C., Cross, J., and Burgess, C. 2008. Severing damage by *Anthonomus rubi* populations in the UK. IOBC/WPRS Bulletin 39:131-136.

Łabanowska, B. H. 2002. Efficacy of some new formulations and new insecticides in controlling the strawberry blossom weevil (*Anthonomus rubi* Hbst.) on strawberry. Journal of Fruit and Ornamental Plant Research 10:177-182.

Stamenković, S., Gudžić, S., Deletić, N., and Sladić, S. 2010. Pest entomofauna of raspberry in the production area of Ivanjica. 45th Croatian & 5th International Symposium on Agriculture 1134-1137.

CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

Responsible Party:

Kyle Beucke, 2800 Gateway Oaks Drive, Suite #200, Sacramento, CA, 95833,
916-698-3034, permits[@]cdfa.ca.gov

*Comment Period: 09/15/2021 – 10/30/2021

*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: A