

California Pest Rating Proposal

***Phenacoccus peruvianus* Granara de Willink: Bougainvillea mealybug**

Hemiptera: Pseudococcidae

Current Rating: A

Proposed Rating: B

Comment Period: 10/23/2019 through 12/7/2019

Initiating Event:

Phenacoccus peruvianus was assigned a rating of A in 2015. In September and October 2019, it was found at ornamental plantings in residential areas in Orange and San Diego counties and is now considered established in California. Therefore, its rating is revised here.

History & Status:

Background: Adult female *P. peruvianus* reach approximately 3 mm in length (Malumphy and Eyre, 2015).

Although they are usually considered pests of bougainvillea, they feed on a variety of plants in at least nine families (Beltrà et al., 2010). Crops reported to be attacked include sweet and chili peppers (Arakelian, 2013; Malumphy et al., 2015) and this mealybug was successfully reared on potato plants in the laboratory (Beltrà et al., 2013). Effects of their feeding include reduced plant growth, leaf loss, and dieback (Malumphy and Eyre, 2015). In addition, these mealybugs produce honeydew, which causes sooty mold, decreasing photosynthesis (Beltrà et al., 2010).

An (apparently also introduced) parasitoid wasp in the genus *Acerophagus* (family Encyrtidae) was found to attack all stages of *P. peruvianus* in Spain (Beltrà et al., 2013).

Worldwide Distribution: *Phenacoccus peruvianus* is native to South America and has been introduced to Europe (including Mediterranean countries and the United Kingdom) (European and Mediterranean Plant Protection Organization, 2019).

Official Control: *Phenacoccus peruvianus* is an A-rated pest in California and is considered reportable by the United States Department of Agriculture.

California Distribution: *Phenacoccus peruvianus* was found on bougainvillea in residential areas in Orange and San Diego counties in September and October 2019.

California Interceptions: Since 2013, *P. peruvianus* has been intercepted 469 times in California, mostly in nurseries, in Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura counties (California Department of Food and Agriculture).

The risk *Phenacoccus peruvianus* poses to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** The distribution of *P. peruvianus*, including much of the Mediterranean region and the United Kingdom, suggests a tolerance for a range of climates. It has a wide host range. This species could establish a wide distribution in California. Therefore, *P. peruvianus* 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:** *Phenacoccus peruvianus* is reported to feed on plants in at least nine families. It may have broader feeding habits than this because it has been found on at least 30 genera of plants in 19 families during nursery inspections in California. 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:** *Phenacoccus peruvianus* is presumed to be capable of dispersal via wind (as first instars) and movement of infested plants. 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.** *Phenacoccus peruvianus* is reported to cause dieback in infested plants, so it could lower yield and increase production costs in crops (including peppers) and ornamental plants. It is not known to be present in other states in the United States, so its presence in California could trigger quarantines. Therefore, it receives a **High (3)** in this category.

Economic Impact: A, B, C

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.** *Phenacoccus peruvianus* is not known to have any environmental impacts. Its presence could trigger treatments by growers of crops and ornamental plants. Therefore, it receives a **High (3)** in this category.

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

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 *Phenacoccus peruvianus*: 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:** *Phenacoccus peruvianus* was found at two locations in California in Orange and San Diego 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:

Phenacoccus peruvianus has been found numerous times in nurseries (many of these in outdoor situations) in multiple southern California counties. These are considered regulatory incidents rather than established populations. Nevertheless, this mealybug is likely to be more widely established than Orange and San Diego counties considering the number of outdoor nursery infestations and presumed ability of this species to disperse as first instars via wind. One species of parasitoid wasp attacks *P. peruvianus* in Spain. It is possible that this and/or other species of natural enemies may be used for control of *P. peruvianus* in California.

Conclusion and Rating Justification:

Phenacoccus peruvianus is a mealybug that has not until now been known to be established in the United States. It has been detected numerous times in nurseries in southern California, and is now known to be established in Orange and San Diego counties. It may impact trade due to its limited distribution in the United States. For these reasons, a “B” rating is justified.

References:

- Arakelian, G. 2013. Bougainvillea mealybug (*Phenacoccus peruvianus*). Accessed October 14, 2019: https://www.cdfa.ca.gov/plant/ppd/PDF/Phenacoccus_peruvianus.pdf
- Beltrà, A., Garcia-Marí, F., and Soto, A. 2013. Seasonal phenology, spatial distribution, and sampling plan for the invasive mealybug *Phenacoccus peruvianus* (Hemiptera: Pseudococcidae). *Journal of Economic Entomology* 106:1486-1494.
- Beltrà, A., Tena, A., and Soto, A. 2013. Reproductive strategies and food sources used by *Acerophagus* n. sp. near *coccos*, a new successful parasitoid of the invasive mealybug *Phenacoccus peruvianus*. *Journal of Pest Science* 86:253-259.
- California Department of Food and Agriculture. Pest and damage record database. Accessed August 28, 2019: <https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx>
- European and Mediterranean Plant Protection Organization. EPPO global database: *Phenacoccus peruvianus*. Accessed August 29, 2019: <https://gd.eppo.int/taxon/PHENPR>
- Malumphy, C., and Eyre, D. 2015. Plant pest factsheet: Bougainvillea mealybug, *Phenacoccus peruvianus*. Accessed August 29, 2019: <https://planthealthportal.defra.gov.uk/assets/factsheets/phenacoccus-peruvianus-defra-factsheet-v2.pdf>
- Malumphy, C., Moyses, A., and Kahrer, A. 2015. Erstnachweis der bougainvillea-wollhaus (*Phenacoccus peruvianus*, Pseudococcidae) an paprika unter glas in Österreich. *Journal für Kulturpflanzen* 67:254-256.

Responsible Party:

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***Comment Period: 10/23/2019 through 12/7/2019**

***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: B