CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

Nipaecoccus viridis (Newstead): Lebbeck mealybug

Hemiptera: Pseudococcidae

Current Rating: Q

Proposed Rating: A

Comment Period: 7/1/2021 – 8/15/2021

Initiating Event:

Nipaecoccus viridis is occasionally intercepted in California on fruit, cut foliage, and plants from Florida, Hawaii, and Thailand. It has not been rated. Therefore, a pest rating proposal is needed.

History & Status:

Background: Adult female *Nipaecoccus viridis* are approximately 4 mm long and blue-green, purple, or black (Stocks and Hodges, 2010). This mealybug is polyphagous and reported hosts include, but are not limited to: Apiaceae: *Apium graveolens*; Apocynaceae: *Nerium oleander*; Arecaceae: *Phoenix dactylifera*; Asparagaceae: *Asparagus sprengeri*; Asteraceae: *Helianthus annuus*; Cactaceae: *Cactus* sp.; Cucurbitaceae: *Lagenaria siceraria*; Cuscutaceae: *Cuscuta exaltata*; Euphorbiaceae: *Ricinus communis*; Fabaceae: *Alhagi maurorum*, *Leucaena leucocephala*; Malvaceae: *Corchorus capsularis*, *Gossypium* sp.; Moraceae: *Morus alba*; Oleaceae: *Olea europea*; Polygonaceae: *Antigon leptopus*; Punicaceae: *Punica granatum*; Rhamnaceae: *Ziziphus spina-christi*; Rosaceae: *Malus* sp., *Prunus armeniaca*, *Pyrus communis*; Rubiaceae: *Gardenia jasminoides*; Rutaceae: *Citrus* sp., Solanaceae: *Cestrum nocturnum*, *Solanum lycopersicum*, *Solanum melongena*, *Solanum tuberosum*; Tamaricaceae: *Tamarix* sp.; Urticaceae: *Pilea serpyllacea*; Vitaceae: *Vitis* sp. (Abdul-Rassoul, 2014; Nechols, 2002; Stocks and Hodges, 2010).

Nipaecoccus viridis is a pest of citrus in Florida and the Mediterranean region. Feeding damage reported on citrus in Florida includes distorted fruit and leaves, branch dieback, and (in the case of young trees) tree death (Diepenbrock and Ahmed, 2020; Franco et al., 2004). This mealybug is also reported to be a pest of soybean and cotton in India, with host impacts including wilting and sooty mold, and white mulberry in Iraq (Abdul-Rassou, 2014; Babu, 2016; Nagrare et al., 2014).

Nipaecoccus viridis is parthenogenetic and is reported to undergo multiple, overlapping generations per year (Thomas and Leppla, 2008; García Morales et al., 2016).

Several parasitoid wasps are reported to be effective biological control agents against *N. viridis*: *Anagyrus aegypticus*, *A. dactylopii*, *A. indicus*, *Leptomastix phenacocci* (Thomas and Leppla, 2008). The ladybird beetle *Cryptolaemus montrouzieri* is also a reported natural enemy (Stocks and Hodges, 2010).

Some insecticides that are used on citrus in California and that were found to cause high mortality of *N. viridis* in laboratory assays include acetamiprid, dimethoate, and zeta-cypermethrin (Diepenbrock, 2021).

Worldwide Distribution: *Nipaecoccus viridis* is widely distributed across the world in subtropical and tropical regions. It is thought to be native to India and its distribution includes North America: Mexico, United States (Florida); South America: Colombia; the Caribbean: Bahamas; Oceania: Australia, New Caledonia, United States (Guam, Hawaii); Africa: Algeria, Angola, Benin, Burkina Faso, Comoros, Côte d'Ivoire, Egypt, Eritrea, Kenya, Madagascar, Malawi, Mauritius, Niger, Nigeria, Réunion, Rwanda, Senegal, Seychelles, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe, Ethiopia, South Africa; Asia: Afghanistan, Bangladesh, Bhutan, Cambodia, China, Hong Kong, Indonesia, India, Iran, Iraq, Israel, Japan, Jordan, Nepal, Oman, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Taiwan, Laos, Malaysia, Myanmar, Singapore, Thailand, Vietnam (Bayisa, 2016; Caballero et al., 2020; CABI Invasive Species Compendium; Diepenbrock and Ahmed, 2020; Mille et al., 2016; Nagrare et al., 2014; Soysouvanh and Hong, 2016; Stocks and Hodges, 2010; Walton et al., 2009).

Official Control: *Nipaecoccus viridis* is considered reportable by the United States Department of Agriculture and it is on the A2 list for East Africa, Southern Africa, and Bahrain and on the A1 list for Brazil, Chile, and Turkey (EPPO global database; United States Department of Agriculture).

California Distribution: *Nipaecoccus viridis* is not known to be established in California.

California Interceptions: *Nipaecoccus viridis* is occasionally intercepted in California. It has been intercepted on rambutan fruit from Thailand, cut flowers from Hawaii, and gardenia plants, cut foliage, sapote fruit, and *Solanum torvum* fruit from Florida (California Department of Food and Agriculture).

The risk *Nipaecoccus viridis* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Nipaecoccus viridis* is polyphagous and is likely to be able to find suitable hosts in most areas of California that have a suitable climate. The climate of much of California (except for the higher mountains) may allow establishment. 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:** *Nipaecoccus viridis* is highly polyphagous and reported to feed on plants in at least 23 families. 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:** *Nipaecoccus viridis* is parthenogenetic. It can be moved with infested plant material, for example, hiding under the sepals of citrus fruit (CABI Invasive Species Compendium). Therefore, it receives a **High (3)** 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**. *Nipaecoccus viridis* is a known pest of citrus, cotton, soybean, and a variety of ornamental plants. It is reported to have significant impacts on citrus fruit and is capable of killing its host plants. Infestations of this mealybug in California could lower crop yield and increase crop production costs. It could also 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**. *Nipaecoccus viridis* is highly polyphagous and is reported to kill plants. Native plants may be impacted by this mealybug. Infestations could affect ornamental plantings as well, and this may trigger treatments. Therefore, *N. viridis* 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 *Nipaecoccus viridis*: High (15)

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:** *Nipaecoccus viridis* 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: High (15)

Uncertainty:

Some of the insecticides that are used on citrus in California were shown in laboratory tests to inflict high mortality on this mealybug. There may also be predators and parasitoids already in California that could be effective in controlling it. Therefore, it is possible that infestations in California may be controllable.

Conclusion and Rating Justification:

Nipaecoccus viridis is a polyphagous mealybug that is known to kill plants. It poses a threat to crop (including citrus), ornamental, and native plants in California and it is not known to be established in this state. For these reasons, an “A” rating is justified.

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*Comment Period: 7/1/2021 – 8/15/2021

*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