CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

***Toumeyella liriodendri* (Gmelin): tuliptree scale**

Hemiptera: Coccidae

Current Rating: B

Proposed Rating: C

Comment Period: 01/04/2023 – 02/18/2023

Initiating Event:

Toumeyella liriodendri has been found in the environment in California in seven counties, from San Diego in the south to Alameda in the north. It is currently rated B. Members of the Nursery Advisory Board requested that a pest rating proposal be prepared in light of the fairly widespread distribution in the state and regulatory impacts associated with nursery infestations.

History & Status:

Background: *Toumeyella liriodendri* is a large (adult females reach 12 mm in length) soft scale. The species is ovoviviparous; eggs hatch inside the adult female and first instar nymphs ("crawlers") emerge in the late summer/early fall (Borden and Dale, 2016). There is reportedly one generation per year in northern part of its range but multiple generations in the south (Van Driesche et al., 2013).

Reported host plants of *T. liriodendri* include 13 genera in nine families: Fabaceae, Hypericaceae, Malvaceae, Polygonaceae, Juglandaceae, Magnoliaceae, Rubiaceae, Salicaceae, and Sapindaceae (García Morales et al., 2016; Novoa et al., 2001; Van Driesche et al., 2013). Impacts only appear to be reported for members of the Magnoliaceae, especially *Liriodendron tulipifera* (tuliptree). Regarding tuliptree, feeding removes sap and the large amount of honeydew results in sooty mold (Borden and Dale, 2016). Heavy infestations can kill trees and impact tree vigor. Seedlings are reported to be

impacted to a greater degree, but tuliptrees with a 10 inch diameter at breast height were reported to be killed by the scale (Burns, 1970; Van Driesche et al., 2013). *Toumeyella liriodendri* is reported to be tended by ants, which makes control more difficult (Borden and Dale, 2016; Van Driesche et al., 2013).

Worldwide Distribution: *Toumeyella liriodendri* is native to the eastern United States. It is reported from: **Caribbean:** Cuba; **North America:** United States (California and the eastern United States, from Florida north to New York and west to Texas) (Borden and Dale, 2016; Novoa et al., 2001; Van Driesche et al., 2013).

Official Control: *Toumeyella liriodendri* is not known to be under official control anywhere.

California Distribution: *Toumeyella liriodendri* has been found in the environment in California on tuliptree and *Magnolia* species in seven counties: Alameda, Los Angeles, Orange, San Diego, Santa Barbara, Santa Clara, and Ventura (California Department of Food and Agriculture).

California Interceptions: *Toumeyella liriodendri* has been intercepted on *Magnolia* species and found in California nurseries on *Magnolia* species on multiple occasions (California Department of Food and Agriculture).

The risk *Toumeyella liriodendri* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Toumeyella liriodendri* is already found in coastal southern California and the San Francisco Bay area. Its known hosts include tuliptree and *Magnolia* species; this scale has been found on both of these in California. It could establish more widely in the state. Therefore, *T. liriodendri* 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:** *Toumeyella liriodendri* is reported to feed on plants in nine families. Therefore, it receives a **Medium (2)** 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:** *Toumeyella liriodendri* could be dispersed via wind and movement of infested plant material. 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**. *Toumeyella liriodendri* is reported to be a significant pest of tuliptree, a commonly-planted tree in California. Impacts could include reduced yield and increased production costs in nurseries. 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**. *Toumeyella liriodendri* impacts street trees and it could trigger treatments. Therefore, *T. liriodendri* 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 *Toumeyella liriodendri*: Medium (12)

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:** *Toumeyella liriodendri* is established in coastal southern California and the San Francisco Bay area. It receives a **Medium (-2)** 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:

Toumeyella liriodendri is likely more widespread in California than the seven counties listed in this proposal. There are no ongoing surveys for this scale. It is possible that there may be native or crop plants in California that are not known hosts but that could be impacted. However, the reports of impacts that were found were limited to the family Magnoliaceae, which does not include any native California plants, and tuliptree and *Magnolia* species are already known to be hosts in California.

Conclusion and Rating Justification:

Toumeyella liriodendri is a pest of tuliptree that has a fairly wide distribution in California. It is not known to impact plants outside of the family Magnoliaceae, and it appears unlikely that significant impacts on new host plants will be found in the state. Eradication does not appear to be feasible. Finds in nurseries have regulatory impacts. For these reasons, a "C" rating is justified.

References:

Borden, M. and Dale, A. 2016. Tuliptree scale *Toumeyella liriodendri* (Gmelin) (Insecta: Hemiptera: Coccoidea: Coccidae). EENY-667. Accessed December 19, 2022: https://entnemdept.ufl.edu/creatures/orn/scales/tuliptree_scale.htm

Burns, D. P. 1970. Insect enemies of yellow-poplar. USFS Research Paper NE-159: 1-15.

California Department of Food and Agriculture. Pest and damage record database. Accessed November 28, 2022: https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx

García Morales, M., Denno, B.D., Miller, D.R., Miller, G.L., Ben-Dov, Y., and N.B. Hardy. 2016. ScaleNet: A literature-based model of scale insect biology and systematics. Accessed December 19, 2022: http://scalenet.info

Novoa, N. M., Hamon, A. B., and Oliver, P. H. 2001. Tres nuevos registros de cóccidos (Hemíptera: Coccoidea: Coccidae) para Cuba. Insecta Mundi 15:189-191.

Van Driesche, R. G., LaForest, J. H., Bargeron, C. T., Reardon, R. C., and Herlihy, M. 2013. Forest pest insects in North America: A photographic guide. United States Forest Service, Morgantown, West Virginia.

Responsible Party:

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

*Comment Period: 01/04/2023 – 02/18/2023

*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.

CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

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