

California Pest Rating Profile for
***Lilioceris lili* (Scopoli): lily leaf beetle**
Coleoptera: Chrysomelidae
Previous Pest Rating: Q
Pest Rating: A as of 05/30/2021

Comment Period: 4/15/2021 – 5/30/2021

Initiating Event:

The United States Department of Agriculture has proposed to deregulate *Lilioceris lili* for the continental United States. This beetle has not been rated. Therefore, a pest rating proposal is needed.

History & Status:

Background: Adult *Lilioceris lili* are distinctive, bright-red beetles that reach approximately 10 mm in length. They feed on the leaves and probably other parts of host plant and lay eggs on leaves in early to midsummer. The larvae are orange with a black head and cover themselves with a fecal shield. They feed externally on the host plant. Larvae leave the plant in the late summer to pupate in the soil. Adults emerge and feed on the host plant until the fall, when they re-enter the soil for overwintering. The adults emerge the following spring to feed and lay eggs. There is one generation per year (Brzica, 2011; Hiskes, 2020; Murray et al., 2012).

This beetle is a well-known pest of cultivated lilies (Liliaceae: *Lilium* spp.), but it has been shown to have a broader host range. *Lilioceris lili* has been reported to complete development on cultivated *Lilium* species of Asian origin as well as the following species native to North America: *Lilium canadense*, *L. philadelphicum*, and *Streptopus amplexifolius* (Liliaceae) (Bouchard, 2008; Ernst, 2005;

Salisbury et al., 2010). Regarding other native North American host plants, *L. lili* adults and larvae were found feeding on (suggesting these may also be reproductive hosts) *Lilium michiganense* (with 40% of plants infested and a mean of 36% of the leaf area removed in infested plants) and *Streptopus lanceolatus* (Blackman, 2016), and adult beetles have been found feeding on *Lilium superbum* and *Polygonatum biflorum* (Asparagaceae) (Blackman, 2017). *Lilium* species appear to be preferred hosts, although different species in the genus vary in their suitability. The fact that *Lilium canadense* and *L. philadelphicum* are reproductive hosts for *L. lili* is evidence that this beetle of Asian origin can easily move to new hosts in North America.

Worldwide Distribution: *Lilioceris lili* is widespread and reported from Europe (including the Mediterranean), Asia, northern Africa, and North America (Canada and the United States). Orlova-Bienkowskaja (2013) presented evidence that *L. lili* is native to temperate East Asia and was introduced to western Europe in the 16th or 17th century. In Canada, it is reported from Newfoundland and Québec (Kealey et al., 2013). In the United States, it is known from the northeastern United States, Michigan, and Washington (Dieni et al., 2015; Hicks and Sellars, 2014; Saeed, 2017). Dieni et al. (2015) suggest, based on molecular evidence, that the infestations in Canada and the United States are the result of two separate introductions.

Official Control: : *Lilioceris lili* is considered reportable by the United States Department of Agriculture, although they are proposing to deregulate the species (USDA-APHIS). It is considered a quarantine pest by Mexico (EPPO Global Database).

California Distribution: *Lilioceris lili* is not known to be established in California.

California Interceptions: *Lilioceris lili* has not been intercepted in California (California Department of Food and Agriculture).

The risk *Lilioceris lili* poses to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** *Lilioceris lili* is reported from a large area in temperate Asia and Europe as well as northern Africa and eastern North America. The climate of much of California is likely suitable, although niche modelling by Freeman et al. (2020) suggest only far northern California may have a suitable climate. Lilies, both native as well as cultivated, are widespread in California. This beetle could probably establish over a large area 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:** The reported reproductive hosts are in the family Liliaceae. 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:** *Lilioceris lili* could be moved on infested plant material. It also flies. 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.** *Lilicoris lili* is considered a serious pest of lilies in cultivation in the northeastern United States. It could lower yield and increase crop production costs if it became established in California. An important easter lily (*Lilium longiflorum*)-growing area (for cut flowers) is present in Curry County, Oregon and Del Norte County, California; this industry could be at risk from an infestation of *L. lili* in this area. 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.** *Lilium lili* could defoliate native California *Lilium* species, of which there are 12; some of these are rare and at least one (*Lilium occidentale*) is endangered. There is a species of *Streptopus*, *S. amplexifolius*, in California and this could be a suitable host as well (Calflora). Infestations of cultivated lilies could trigger treatments, and manual removal of beetles and larvae may occur in gardens, as this is a common method of control. Therefore, *L. lili* receives a **High (3)** in this category.

Environmental Impact: A, B, 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 *Liliocoris lili*: Medium (11)

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: *Liliocoris lili* 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 (11)

Uncertainty:

The native California *Lilium* species may not be suitable hosts for *L. lili*, although it seems likely that at least some of them would be, based on the fact that native *Lilium* species in eastern North America have been shown to be good hosts. Niche modelling by Freeman et al. (2020) suggests that only the far northern portion of California might have a suitable climate for this beetle.

Conclusion and Rating Justification:

Lilioceris lili is a beetle that feeds on lilies, both cultivated as well as wild, and a few other plants. If it became established in California, it could impact lily cultivation as well as native lilies, some of which are rare. It is not known to be in California. For these reasons, an “A” rating is justified.

References:

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Responsible Party:

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***Comment Period:**

***NOTE: 4/15/2021 – 5/30/2021**

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](mailto: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.
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Pest Rating: A