

CALIFORNIA PEST RATING PROFILE

Acalitus phloeocoptes (Nalepa): Plum bud gall mite

Eriophyidae

Pest Rating: A

Initiating Event:

On February 12, 2019, galls of *Acalitus phloeocoptes* were found on plum trees at an orchard in Morgan Hill, California. This mite has not been rated. A permanent pest rating proposal is required to support an official pest rating.

History & Status:

Background: *Acalitus phloeocoptes* is a gall-forming mite that is apparently restricted to the genera *Prunus* and *Cotoneaster*. The adult females are approximately 0.15 mm in length, white, and worm-like (Vacante, 2016). They disperse from galls in spring and crawl under bud scales, where they feed. This induces gall formation. The mites become enclosed by the galls, which enlarge and become woody through the course of the year. There are apparently multiple generations per year (Jeppson et al., 1975). The mites overwinter in the galls, and in the spring, the galls split and adult females disperse.

Damage has been reported on almond, apricot, and plum trees, but this mite is reported to cause more severe damage to almonds. Bud dieback and death of trees are reported in almonds (Kamali et al., 2016; Temreshev et al., 2016).

Recommended control methods include pruning infested shoots in winter and spraying pesticides. For example, in Spain, two sprayings of endosulfan proved effective, reducing infestation by 95%. Spraying needs to be synchronized with the spring emergence of adults and beginning of gall formation (Vacante, 2016)

Worldwide Distribution: *Acalitus phloeocoptes* is known to be present in Southern and Central Europe and Asia Minor (including Lebanon and Syria) (Jeppson et al., 1975; Talhouk, 1977; Temreshev et al., 2018). It was reported from the United States (Pennsylvania) by Garman (1894), but this appears to be the only record of the species in the United States (Castagnoli and Oldfield, 1996). It may also be in China (Navia et al., 2010).

Official Control: *Acalitus phloeocoptes* is considered reportable by the United States Department of Agriculture (USDA-APHIS).

California Distribution: *Acalitus phloeocoptes* has not previously been found in California.

California Interceptions: The 2019 finds at the orchard in Morgan Hill are the only interceptions of *Acalitus phloeocoptes* in California (California Department of Food and Agriculture).

The risk *Acalitus phloeocoptes* poses to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** *Acalitus phloeocoptes* has been reported from areas with temperate and Mediterranean climates. This mite is reported to attack *Prunus* species, including almond and stone fruit trees that are planted widely in California. It is likely that this mite could become established over a large portion of California. Therefore, *A. phloeocoptes* 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:** *Acalitus phloeocoptes* is apparently restricted to two genera, *Prunus* and *Cotoneaster*. 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:** Female *Acalitus phloeocoptes* are reported to produce as many as 700-850 eggs. Dispersal of mites following splitting of the galls is reported to occur via wind and even insects (Jeppson et al., 1975). 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:** Almonds and stone fruit trees (including plums and apricots) in California are threatened by *A. phloeocoptes*. Damage to apricots was reported to be economically significant in Kazakhstan (Temreshev et al., 2018). Damage to almond trees is reported to be severe, and death of trees is reported. Almond production in California was worth \$5.6 billion in 2017 (California Department of Food and Agriculture (b)). Control methods include pruning of infested shoots and spraying of pesticides, which would likely increase production costs. The presence of this mite in California could lead to quarantines by other states or countries that grow *Prunus* species. Therefore, it receives a **High (3)** in this category.

Economic Impact: A, B, C, D

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: 3

- 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:** Infestations of this mite could impact ornamental cultivars of *Prunus* as well as native *Prunus* species and it could also trigger treatments. Therefore, it receives a **High (3)** in this category.

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

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: 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 *Acalitus phloeocoptes*: High (13)

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:** *Acalitus phloeocoptes* 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 (13)**

Uncertainty:

The galls of this species may have gone unnoticed in some trees in California. In addition, it is possible that this mite has already dispersed to other areas of the state. For these reasons, it is not possible to exclude the possibility that this species is already established in the state. This would not substantially affect the risk estimate of this pest.

Conclusion and Rating Justification:

Acaletus phloeocoptes is considered a significant pest of almonds, the third most valuable crop in California. It may also pose a threat to stone fruits in the genus *Prunus*. It is not known to be established in the state. For these reasons, an “A” rating is justified.

References:

California Department of Food and Agriculture (a). Pest and damage record database. Accessed February 22, 2019:

<https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx>

California Department of Food and Agriculture (b). California agricultural production statistics. Accessed February 22, 2019:

<https://www.cdfa.ca.gov/statistics/>

Castagnoli, M. and Oldfield, G. N. 1996. 3.2.3 Other fruit trees and nut trees. pp. 543-559 in Lindquist, E. E., Sabelis, M. W., and Bruin, J. (eds.), *Eriophyoid mites – Their Biology, Natural Enemies and Control*. Elsevier, Amsterdam, Netherlands.

Garman, H. 1894. A plum twig gall produced by a mite. Kentucky Agricultural Experiment Station, Seventh annual report.

Jeppson, L. T., Keifer, H. H, and Baker, E. W. 1975. *Mites Injurious to Economic Plants*. University of California Press, Berkeley, California.

Kamali, H., Sirjani, M., and Bazoobandi, M. 2016. Biological characteristics of almond bud mite, *Acalitus phloeocoptes* (Nalepa) (Acari: Eriophyoidea) in Khorasan-e-Razavi Province. *Plant Pest Research* 6:63-74.

Navia, D., Ochoa, R., Welbourn, C., and Ferragut, F. 2010. Adventive eriophyoid mites: A global review of their impact, pathways, prevention and challenges. *Experimental & Applied Acarology* 51:225-255.

Talhok, A. S. 1977. Contribution to the knowledge of almond pests on East Mediterranean countries. VI. The sap-sucking pests. *Zeitschrift für angewandte Entomologie* 83:248-257.

Temreshev, I. I., Kopzhasarov, B. K., Slyamova, N. D., Beknazarova, Z. B., and Darubayev, A. A. 2018. First records of invasive pests almond bud mite *Acalitus phloeocoptes* (Nalepa, 1890) (Acari, Trombidiformes, Eriophyidae) in Kazakhstan. *Acta Biologica Sibirica* 4:6-11.

USDA-APHIS. U.S. regulated plant pest table. Accessed February 22, 2019:

<https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/rppl/rppl-table>

Vacante, V. 2016. *The handbook of mites of economic plants*. CAB International. Wallingford, United Kingdom.

Responsible Party:

Kyle Beucke, 1220 N Street, Room 221, Sacramento, CA, 95814, 916-403-6741,
plant.health[@]cdfa.ca.gov

CLOSED Comment Period: 3/4/19 – 4/18/19