

California Pest Rating Proposal for Watermelon crinkle leaf-associated virus 2

Current Pest Rating: none

Proposed Pest Rating: B

Kingdom: Orthornavirae, Phylum: Negarnaviricota,
Class: Bunyaviricetes, Order: Hareavirales,
Family: Phenuiviridae, Genus:
Species: *Coguvirus henanense*

Comment Period: 07/21/2026 through 09/04/2026

Initiating Event:

In May 2026, Professor Robert Gilbertson (University of California, Davis) informed CDFA Permits that watermelon crinkle leaf-associated virus 1 (WCLaV-1) and 2 (WCLaV-2) had been detected from symptomatic watermelon ‘Celebration’ collected by UCCE plant pathologist Tom Turini from a commercial field in Fresno County (personal communication). An official sample was collected by Fresno County agricultural biologists and submitted to CDFA’s Plant Pest Diagnostics Center. Plant pathologist Tongyan Tian detected WCLaV-2 with RT-PCR and sequencing. This virus has not been evaluated through the pest rating process. The risk that WCLaV-2 poses to California agriculture is evaluated herein, and a permanent rating is proposed.

History & Status:

Background:

Cucurbits are a significant specialty crop in California, grown mainly in the Central Valley and desert production regions, and California is a leading U.S. producer. In 2024, the farm gate value was approximately \$400M for watermelon, cantaloupe, honeydew, squash, and cucumber crops. California is also a major producer of cucurbit seeds for export (USDA NASS, 2026).

The initial identification of WCLaV-2 was made in China on watermelon during surveys conducted in 2015 and 2016 (Xin et al., 2017). The first US report was on watermelon from Texas in 2020 (Hernandez et al., 2021). It was detected in 2023 from watermelon and zucchini in Yuma, Arizona, which is on the border with California (Murcia Bermudez et al., 2025). WCLaV-1 and WCLaV-2 were

placed in the genus *Coguvirus* (family Phenuiviridae) based on genome organization (Zhang et al., 2021). Little is known about the mode(s) of transmission or potential vectors of *Coguvirus* spp., although it has been suggested that seed is a probable means of transmission. The impact on watermelon health and yield is unknown, and WCLaV-2 often co-occurs with WCLaV-1 and with other cucurbit viruses (Hendricks and Roberts, 2023). This co-infection makes it difficult to clarify its transmission, symptoms, and potential risk.

Hosts: *Citrullus lanatus* (watermelon), *Cucumis melo* (melon), *C. sativus* (cucumber), *Cucurbita pepo* (squash), *Cucurbita pepo* var. *recticollis* (straightneck squash) (de Moya-Ruiz et al., 2025; EPPO, 2026; Jailani et al., 2023).

Symptoms: Watermelon is the host in which symptoms have been most thoroughly described. Reported symptoms include leaf crinkling, wrinkling, curling, and puckering. Chlorosis and yellow mottling, mosaic patterns, thickened leaves, distorted new growth, stunting, and reduced vigor have also been reported. Fruit symptoms may include circular lesions and deformation (Hendricks and Roberts, 2023; EPPO, 2026).

Straightneck squash reported symptoms include chlorosis, crinkling, mild mosaic, and mottling. Because mixed infections with other cucurbit viruses are common, symptom expression may vary, and visual diagnosis is not considered reliable (Jailani et al., 2023; Hendricks and Roberts, 2023).

Transmission: The natural mode of transmission of WCLaV-2 remains uncertain. No arthropod vector has been identified despite investigations. This is somewhat unusual because many members of this group are known to be transmitted by arthropods such as thrips, mites, or other insects (EPPO, 2026). It can be mechanically transmitted (Xin et al., 2017; EPPO, 2026). Strong evidence of seed transmission comes from Kauffmann et al. (2024), although others have also suggested it. They developed specific antibodies against WCLaV-1 and WCLaV-2 and used them to test seedlings grown from commercial watermelon seed lots. They detected WCLaV-2 in seedlings from commercial seed lots, with high infection rates in some lots. They also showed that seed lots that were 8 years old still had detectable levels of virus.

Damage Potential: The impact of WCLaV-2 remains incompletely understood because the virus was only recently discovered and is frequently detected in mixed infections. Available evidence indicates that WCLaV-2 has the potential to damage cucurbit production. The virus has been reported in production fields and has been associated with symptoms including leaf crinkling, chlorosis, mosaic, stunting, and fruit lesions or deformation. Although quantitative yield loss data are lacking, the ability of the virus to infect multiple economically important cucurbit crops, its occurrence in commercial production areas, and its increasing geographical distribution suggest that WCLaV-2 could negatively affect the production and marketability of cucurbits.

Worldwide Distribution: Brazil, China, Greece, Italy, Slovenia, Spain, United States (Arizona, Florida, Georgia, Oklahoma, Texas) (EPPO, 2026).

Official Control: none

California Distribution: one detection in Fresno County (see 'Initiating event')

California Interceptions: none

The risk that watermelon crinkle leaf-associated virus 2 would pose to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** This virus is likely to be found wherever its hosts can grow.

Evaluate if the pest would have suitable hosts and climate to establish in California.

Score: 2

- Low (1) Not likely to be established 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 host range is limited to some cucurbits.

Evaluate the host range of the pest.

Score: 1

- **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 Potential:** WCLaV-2 replicates inside its host plants. If it is proven to be seed-borne, the movement of infected seed will facilitate its spread around the world. No insect vectors have been identified.

Evaluate the natural and artificial dispersal potential of the pest.

Score: 2

- Low (1) does not have high reproductive or dispersal potential.
- **Medium (2) has either high reproductive or dispersal potential.**
- High (3) has both high reproductive and dispersal potential.

- 4) **Economic Impact:** New or emerging cucurbit viruses are a major concern. It is difficult to gather yield information when viruses are commonly found in mixed infections.

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

Economic Impact: A, B

A. The pest could lower crop yield.

B. The pest could lower crop value (including increasing crop production costs).

- C. The pest could trigger the loss of markets (including 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:

- 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:** Several native species in the family Cucurbitaceae occur in California. Although the susceptibility of these native species to WCLaV-2 has not been investigated, they could potentially serve as reservoirs for the virus if they are susceptible.

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

Environmental Impact: A

- 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: 2

- 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 watermelon crinkle leaf-associated virus 2: Medium

Add up the total score and include it here. **9**

- Low = 5-8 points
- Medium = 9-12 points**
- High = 13-15 points

- 6) Post-Entry Distribution and Survey Information:** Evaluate the known distribution in California. Only official records identified by a taxonomic expert and supported by voucher specimens deposited in natural history collections should be considered. Pest incursions that have been eradicated, are under eradication, or have been delimited with no further detections should not be included.

Evaluation is: 'Not established'.

Score: 0

-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.

7) The final score is the consequences of the introduction score minus the post-entry distribution and survey information score: (Score)

Final Score: *Score of Consequences of Introduction – Score of Post Entry Distribution and Survey Information = 9*

Uncertainty:

If surveys eventually show that WCLaV-2 is already widespread in California cucurbit production areas, a C-rating would become more appropriate. The current California distribution is uncertain. The natural transmission biology of WCLaV-2 is also incompletely understood. Seed transmission has been reported, but no insect or mite vector has been identified.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for **watermelon crinkle leaf-associated virus-2 is B.**

References:

de Moya-Ruiz, C., Juárez, M., Ferriol, I. and Gómez, P., 2025. First report of watermelon crinkle leaf-associated virus 1 and 2 in different cucurbit hosts in Spain. *New Disease Reports*, 51(2), e70040. DOI: 10.1002/ndr2.70040.

EPPO Database, 2026. *Coguvirus henanense*. EPPO Global Database. <https://gd.eppo.int/taxon/WCLAV2>. Accessed 6/30/2026.

Hendricks, K.E. and Roberts, P.D., 2023. Distribution and incidence of watermelon crinkle leaf-associated virus 1, watermelon crinkle leaf-associated virus 2, and other viruses in cucurbits in South Florida. *Plant Health Progress*, 24(4), pp.488-497.

Hernandez, R.N., Isakeit, T., Al Rwahnih, M., Villegas, C. and Alabi, O.J., 2021. First report of watermelon crinkle leaf-associated virus 1 (WCLaV-1) and WCLaV-2 infecting watermelon (*Citrullus lanatus*) in the United States. *Plant Disease*, 105(7), p.2025.

Jailani, A.A.K., Iriarte, F.B. and Paret, M.L., 2023. First report of watermelon crinkle leaf-associated virus (WCLaV)-1 and WCLaV-2 infecting straightneck squash in the United States. *Plant Disease*, 107(8), p.2561.

Kauffmann, C.M., Vendramini, M., Batista, A.M., Mota, H.B., Andrade, I.A., Cárdenas, S.B., Queiroz, P.S., Silva, B.A., Correa, J.R. and Nagata, T., 2024. Specific antibody production using recombinant proteins to elucidate seed transmission and nuclear localization of *Coguvirus citrulli* and *Coguvirus henanense* in radicles of watermelon crop. *Journal of Virological Methods*, 325, p.114886.

Murcia Bermudez, J.M., Porchas, M., Gonzalez-Bello, D.A., Soto-Robles, R. and Poudel-Ward, B., 2025. First report of Watermelon crinkle leaf-associated virus 1 (WCLaV-1) and (WCLaV-2) infecting *Citrullus lanatus* in Arizona, USA. *Plant Disease*, 109(11), p.2448.

USDA NASS, 2026. 2025 State Agriculture Overview for California. United States Department of Agriculture, National Agricultural Statistics Service. Accessed 6/30/2026.

Xin, M., Cao, M., Liu, W., Ren, Y., Zhou, X. and Wang, X., 2017. Two negative-strand RNA viruses identified in watermelon represent a novel clade in the order Bunyavirales. *Frontiers in Microbiology*, 8, p.1514.

Zhang, S., Tian, X., Navarro, B., Di Serio, F. and Cao, M., 2021. Watermelon crinkle leaf-associated virus 1 and watermelon crinkle leaf-associated virus 2 have a bipartite genome with molecular signatures typical of the members of the genus *Coguvirus* (family Phenuiviridae). *Archives of Virology*, 166(10), pp.2829-2834.

Responsible Party:

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***Comment Period: 07/21/2026 through 09/04/2026**

*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](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.

Proposed Pest Rating: B
