cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Raspberry ringspot nepovirus

Current Pest Rating: none

Proposed Pest Rating: A

Domain: Virus, Group: RNA viruses,
Group: Positive sense ssRNA viruses,
Order: Picornavirales, Family: Secoviridae,
Subfamily: Comovirinae, Genus: Nepovirus

Comment Period: 01/08/2026 through 02/22/2026

Initiating Event:

This pathogen has not been through the pest rating process. The risk to California from Raspberry ringspot virus (RpRSV) is described herein, and a permanent rating is proposed.

History & Status:

Background:

There are eight nematode-transmitted viruses known to infect *Rubus*. All are members of the family Secoviridae, with six of them belonging to the genus Nepovirus, subfamily Comovirinae. Nepovirus is named from Nematode-transmitted Polyhedral virus. Plants serve as natural hosts, and there are 55 species in this genus. Nepoviruses are most often transmitted by longidorid nematodes. Nepoviruses cause a variety of diseases of economic importance, notably on grapevine, fruit trees, small fruits, and other horticultural crops, especially when present in mixed infections with other viruses (Mayo and Robinson, 1996; Martin et al., 2013).

The disease symptoms in raspberries were first seen and described in the UK by Harris et al. (1943). Raspberry ringspot nepovirus (RpRSV) was described in raspberry, sugar beet, and several weed species by Cadman (1956). Harrison (1958) showed that RpRSV was soil-borne, and Taylor and Murant (1969) showed that the free-living soil-inhabiting nematodes, *Longidorus elongatus* and *L. macrosoma*, can transmit the disease. RpRSV belongs to subgroup A of the genus Nepovirus (Ebel et al., 2003). Today, the virus has been found throughout Europe and infects dicotyledonous and monocotyledonous plants belonging to at least 14 families. RpRSV typically causes systemic symptoms on leaves, comprising chlorotic ringspots, mottling and leaf deformation and distortion, eventually with reduced growth and stunting of shoots in severe systemic infections (Murant, 1987).

Hosts: The main host of RpRSV is *Rubus idaeus* (raspberry). Other important hosts include *Fragaria x ananassa* (strawberry) and *Prunus avium* (cherry). Detections have been made on these hosts: *Prunus armeniaca* (apricot), *Prunus domestica* (plum), *Prunus dulcis* (almond), *Prunus laurocerasus* (cherry laurel), *Prunus persica* (peach), *Ribes rubrum* (red current), *Ribes uva-crispa* (gooseberry), and *Vitis vinifera* (grape), but they have less economic importance. Hosts that have been infected experimentally include: *Chenopodium giganteum* (tree spinach), *Cucurbita* (cucurbits), *Iberis saxatilis* (rock candytuft), *Nicotiana glauca* (tree tobacco), *Nicotiana tabacum* (tobacco), *Petunia, Phaseolus vulgaris* (bean), *Solanum lycopersicum* (tomato), *Spinacia oleracea* (spinach), and *Vigna unguiculata* (cowpea) (EPPO, 2025).

Symptoms:

On Raspberries: The typically patchy distribution of infected plants in the field reflects the dispersion of the nematode vectors. In the winter, for very susceptible varieties, some or all the infected canes may die, as infected plants are more frost sensitive. Those that survive grow brittle, stunted shoots with curled leaves that gradually die back from the tip. Less susceptible varieties may show only mild symptoms or be asymptomatic on fruiting cane leaves, but new shoots in the spring may show a noticeable yellowish-green ringspot or oak-leaf pattern may appear on young, expanding leaves; there may also be chlorotic patches and a net-like chlorosis along the smaller veins. There could be some dieback and necrosis. It should be emphasized that raspberries of all cultivars may be infected without showing symptoms, either because their roots are newly infected and the virus has not yet invaded the shoots, or because of seasonal fluctuations in symptom expression.

On Strawberries: Symptoms can vary with cultivar and viral strain. The disease appears as progressive dwarfing, and plants may die. Young plants show clearly defined, irregularly shaped chlorotic spots on leaves, often with a necrotic center, but without line patterns or ringspots. Symptoms ameliorate as the plants mature and under warmer summer temperatures (EPPO, 2025; Martin et al., 2013).

Transmission: Plants for planting are the most significant pathway for long-distance movement of this virus. RpRSV is transmitted by two species of needle nematodes. One, *Longidorus elongatus*, is widespread in California but not fully established in the endangered areas in this state. It has a B-rating (Chitambar, 2015). The other, *Longidorus macrosoma*, is not known to be in North America (Chitambar et al., 2018; Nemaplex, 2010). Both adults and juveniles of both of these nematodes can transmit the virus by feeding, but the virus is not found in nematode eggs (Trudgill and Brown, 1978). There is also a report of RpRSV transmission by members of the nematode genera *Paratrichodorus* and *Xiphinema* (Trudgill et al., 1983), and a report of transmission by *Paralongidorus maxiumus* from (Taylor and Brown, 1997). The virus can be mechanically transmitted with infected sap to herbaceous plants and is also transmitted through seed. Infected weeds are a reservoir of the virus for the nematodes. It is not pollen-transmitted (CABI, 2025).

Damage Potential: RpRSV causes a severe disease on raspberry, reducing both growth and fruit yield and killing susceptible plants. In others, it remains latent or only mild symptoms are expressed. It is of great economic importance in Germany and Russia, and of some economic importance in the other

countries where it is established (EPPO, 2025). Mixed infections of Arabis mosaic virus and RpRSV cause a significant disease of grapes (Wetzel et al., 2006).

Worldwide Distribution: Asia: *Kazakhstan*, Europe: *Albania, Belarus, Bulgaria, Czechia, Finland, France, Germany, Greece, Ireland, Latvia, Luxembourg, Netherlands, Norway, Poland, Portugal, Russian Federation, Slovenia, Spain, Switzerland, Türkiye,* and *the United Kingdom* (EPPO, 2025).

Official Control*:* RpRSV is on the EPPO's A1 list for Argentina, Bahrain, Brazil, Chile, Egypt, Eurasian Economic Union (EAEU), Iran, Jordan, Georgia, Serbia, Ukraine; the A2 list for Comité de Sanidad Vegetal del Cono Sur (COSAVE), European Plant Protection Organization EPPO, and Türkiye; regulated quarantine pest for Canada, Israel, Mexico, Morocco, Norway, Tunisia, and the United States of America, and non-quarantine pest in the Russian Federation, Switzerland, and the United Kingdom (EPPO, 2025). Raspberry ringspot virus is on the USDA PCIT's harmful organisms list for Albania, Argentina, Azerbaijan, Brazil, Canada, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, Eurasian Customs Union, Georgia, Honduras, Indonesia, Israel, Japan, Morocco, Norway, Republic of North Macedonia, Oman, Peru, South Africa, Timor-Leste, Tunisia, The Republic of Türkiye, United Arab Emirates and Uruguay (USDA-PCIT, 2025).

California Distribution: None

California Interceptions: None

The risk that Raspberry ringspot virus would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** RpRSV is found in diverse ecoclimatic conditions in Europe. It is likely to be found wherever its host can grow.

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

   Score: **2**
   - Low (1) Not likely to establish in California; or likely to establish in very limited areas.
   - Medium (2) may be able to be established in a larger but limited part of California.
   - High (3) likely to establish a widespread distribution in California.

2) **Known Pest Host Range:** There are hosts in multiple plant families.

   Evaluate the host range of the pest.

   Score: 3
   - 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:** Infection with this virus can result in diseases with severe symptoms in woody plants, but virus-infected plants generally remain localized because of limited spread by the nematode vectors. In herbaceous hosts, the disease is seed-borne.

   Evaluate the natural and artificial dispersal potential of the pest.

   Score: 3
   - 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:** Susceptible varieties suffer substantial losses in yield and can even be killed. It vectored by plant parasitic nematodes, and it is a quarantine pest in some areas.

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

   Economic Impact: A, B, C, E
   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: **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:** With a large host range, this virus could become established in natural communities. It could be damaging to home gardens.

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

   Environmental Impact: A, 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 the Introduction to California for Raspberry ringspot virus*:* 14

Add up the total score and include it here. **High**
-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 consequence 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* ***= 14***

Uncertainty:

Longidorus elongatus also transmits tomato black ring nepovirus, which produces identical symptoms in plant hosts and is often found co-infecting plants with RpRSV. Tomato black ring nepovirus is not known to occur in California; any suspects should be diagnosed by an expert virologist (Martin et al., 2013).

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for **Raspberry ringspot virus is A.**

References:

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*Comment Period: 01/08/2026 through 02/22/2026

*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.

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