CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Longidorus macrosoma Hooper, 1961
needle nematode

Current Pest Rating: none

Proposed Pest Rating: A

Kingdom: Animalia, Phylum: Nematoda,
Class: Enoplea, Order: Dorylaimina;
Superfamily: Dorylaimoidea,
Family: Longidoridae

Comment Period: 02/06/2026-03/23/2026

Initiating Event:

This nematode has not been through the pest rating process. The risk to California from *Longidorus macrosoma* is described herein, and a permanent pest rating is proposed.

History & Status:

Background: The Longidoridae are a family of ectoparasitic nematodes, including two subfamilies and six genera with hundreds of species. They are called “needle nematodes” because they are very long and slender; some are the longest phytopathogenic nematodes known, reaching up to 12 mm in length. In addition to having a very long and narrow body, they have an elongated axial spear called an odontostyle and an extension called an odontophore. They are migratory ectoparasites; they are found throughout the warmer and temperate regions of the world on a variety of plants that include fruit and forest trees, ornamentals, grapevine, grass, and vegetable plant species. In many species, males are rare, and reproduction is by parthenogenesis. Where males are found, bisexual reproduction occurs. Some longidorids are vectors of nepoviruses (Taylor and Brown, 1997). This species, *L. macrosoma*, is phytopathologically important because it is a known virus vector

California is a major producer of small fruits (berries and grapes) and tree fruit. Scottish raspberry leaf curl disease was first described by Cadman (1956) in Scotland, which was later attributed to Raspberry ringspot nepovirus (RpRSV), which can be transmitted by nematode vectors, including *L. elongatus* and *L. macrosoma*. Different strains are often associated with specific nematode types, with *L. macrosoma* described as transmitting the “Scottish strains”. This nematode species, singularly or as part of a nematode complex, also transmits Tomato black ring virus to small fruits (Trudgill and Brown, 1978;

Taylor and Brown, 1997), and Spoon leaf virus to red currants, certain raspberry varieties, and weeds (Harrison, 1961).

Hosts: Mainly woody perennials such as cherry, rose, brambles, and grape (Nemaplex, 2010). High population densities were found under raspberry, blackcurrant, and cherry, and low densities under grass and alternating spring barley and fallow (Cotton, 1976; Brown and Boag, 1975).

Symptoms: Severe damage to certain crops has been caused by the direct feeding of the nematode. However, the major economic impact caused by this nematode is due to its ability to vector plant viruses. *Longidorus macrosoma* transmits the Scottish strains of raspberry ringspot virus (RpRSV) and tomato black ring virus (TBRV). Strawberry roots are slightly damaged by direct feeding of the nematode, but the bigger damage is caused by the nepoviruses. Raspberry, although a poor host to the nematode, is readily infected by both viruses transmitted by the nematode, resulting in severe crop loss. *Longidorus spp.* and *Trichodorus* spp. (stubby root nematode) and viruses are involved in the "docking disorder" of sugar beet (Cooke, 1973). The virus is carried on the inner surface of the guiding sheath of the nematode's stylet (Taylor and Brown, 1997). The nematode species also transmits spoon leaf virus to red currants, certain raspberry varieties, and weeds.

Transmission: This nematode species can spread over both short and long distances when transported in infested soils accompanying plant stock, farm machinery, runoff, and irrigation water, as well as through human and animal activity, and soil-contaminated clothing (Chitambar et al., 2018).

Damage Potential: Longidorus macrosoma is found in a wide range of soils, especially sandy and sandy loam soils. Hatched juveniles are attracted to crop plants to feed on the root tips and externally on the roots by inserting their piercing mouthparts into cells of the root and the root hairs. Enzymes are injected into these cells, and the resulting substrate is withdrawn into the gut of the nematode. Feeding on the tap root of sugar beets at an early stage of plant development can result in the growing tip being killed, which encourages lateral roots to take over. The net result is short, stubby, stunted plants with numerous laterally growing side roots, which creates a condition described as "fanging". Affected plants can be stunted, resulting in so-called 'hen and chick' symptoms where a large, healthy plant has a small, stunted plant as a neighbor. Nematode feeding also wounds the roots, allowing secondary attack by other soil-borne pathogens (Cooke, 1973; Gratwick, 1992).

RpRSV causes severe disease in raspberries, reducing 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, 2026).

Worldwide Distribution: Europe's temperate and Mediterranean zones, including Bulgaria, France, Greece, Germany, Portugal, Spain, and the United Kingdom (Navas et al., 1990 and 1993; Gutierrez-Gutierrez et al., 2016; Robbins and Brown, 1991; Brown and Taylor, 1987).

Official Control*: Longidorus macrosoma* is listed by the EPPO as an A1 pest and regulated in Chile and is a regulated non-quarantine pest in Switzerland and the United Kingdom (EPPO, 2026). It is on the USDA PCIT's harmful organisms list for Canada, Chile, and Ecuador (USDA-PCIT, 2026).

California Distribution: none

California Interceptions: none

The risk that *Longidorus macrosoma* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Longidorus macrosoma* is able to establish in temperate and moist regions of California.

   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:** *Longidorus macrosoma* has a host range that includes herbaceous annual and perennial crops, turf grass, and weeds.

   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:** The nematode's life cycle and increase is dependent on soil temperature and plant host. Long and short distance spread is mainly through infested soils accompanying plant stock, farm machinery, runoff, splash contaminated irrigation water, human and animal activity and soil contaminated clothing.

   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:** Infestations of *Longidorus macrosoma* could result in lowered crop yield and value, loss in market, and a change in cultural practices to mitigate the risk of spread to non-infested sites. The main economic damage is due to its ability to vector nepoviruses.

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:** The impact of *Longidorus macrosoma* on natural environments is not known, however, the infestations of the pest could affect cultural practices, home gardening and ornamental plantings.

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

Environmental Impact: 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: 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 *Longidorus macrosoma:* 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**: 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* ***= 13***

Uncertainty:

There is limited information on the environmental impacts of this nematode.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for *Longidorus macrosoma* **is A.**

References:

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Responsible Party:

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***Comment Period: 02/06/2026-03/23/2026**

***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