CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Profile for

Xiphinema hunaniense Wang & Wu, 1992

Dagger nematode

Pest Rating: A

Kingdom: Animalia, Phylum: Nematoda,
Class: Enoplea, Order: Dorylaimida,
Family: Longidoridae

Comment Period: 10/05/2026 through 11/19/2026

Initiating Event:

In September 2025, Santa Clara County agricultural inspectors intercepted a large package with over 100 lbs. of various tree species at UPS. The trees were shipped by a resident of Wake Co., North Carolina, to a resident of Santa Clara Co. A notice of rejection was issued to the shipper and the receiver for multiple State Exterior quarantine violations. A soil and root sample was submitted to CDFA's Plant Pest Diagnostics Center at Meadowview. CDFA Nematologist Sergei Subbotin identified *Pratylenchus coffeae,* a B-rated pathogen, and, for the first time in California, *Xiphinema hunaniense*. The identification was made with DNA sequencing, and he assigned *X. hunaniense* a temporary Q-rating.

History & Status:

Background:

Xiphinema is an important genus of longidorid nematodes, recognized by a long, slender body and a long spear-like feeding apparatus called an odontostylet. From this, they derive their common name, the 'dagger nematodes'. The odontostylet has no stylet knobs but rather has flanges, which support and anchor the base. There is a guiding ring in the middle that holds the long stylet in position. Dagger nematodes have six life stages, and the life cycle is similar to other ectoparasitic, vermiform nematodes. Parthenogenesis, a form of reproduction that does not require males, is common in many, but not all species. Females lay eggs in soil. Juveniles hatch from eggs and molt four times, increasing in size with each molt until they become female adults.

All stages, except eggs, attack and feed on the roots of the host plants. The nematode inserts the long stylet deep into the root while the body remains outside. The stylet punctures cell walls, and during feeding, enzymes such as cellulases, pectinases, hemi-cellulases, and chitinases are secreted to digest plant cell contents. This destroys root cells, resulting in malformed root tissues (Heve et al., 2018).

There are over 250 species within the genus, and these have been divided into various groups and/or subgenera based mainly on morphological affinities. *Xiphinema* is a migratory ectoparasite of roots, adapted to feeding on woody plants. They are primarily problematic in biennial and permanent crops. The different species are spread worldwide; some can vector nepoviruses which are directly damaging to important orchard, soft fruit, and vine crops (Decraemer and Robbins, 2007; Nemaplex, 2010; Chitambar et al., 2018).

Xiphinema hunaniense is a polyphagous dagger nematode species found in East and Southeast Asia. It is associated with a wide variety of woody plants, fruit crops, ornamentals, and ferns. *Xiphinema hunaniense* was first described from soil around grapevines in Hunan province, China (Wang and Wu, 1992). In a 2007 study, Wu et al. collected and measured a population of females and juveniles. Males were absent. *Xiphinema hunaniense* is not currently known to be a virus vector and is in the 'non-americanum' group.

Hosts: *Acacia confusa* (Formosa acacia), *A. mangium* (black wattle), *Blechnum orientale* (centipede fern), *Camellia japonica* (Japanese camellia), *C. sasanqua* (sasanqua camellia), *C. sinensis* (tea), *Juniperus chinensis* (Chinese juniper), *Citrus grandis* (pumelo), *C. sinensis* (sweet orange), *Cycas revoluta* (sago palm), *Dicranopteris linearis* (false staghorn fern), *Dimocarpus longan* (longan), *Eriobotrya japonica* (loquat), *Hibiscus rosa-sinensis* (Chinese hibiscus), *Ligustrum quihoui* (waxyleaf privet), *Litchi chinensis* (litchi), *Mangifera indica* (mango), *Pinus* sp. (pine), *Pyrus pyrifolia* var. *Yokoyama* (pear), *Vitis vinifera* (grape) (Wang and Wu, 1992; Chen et al., 2004; Wu et al., 2007; Zheng et al., 2015; Li et al., 2014; Zheng et al., 1999; and Long et al., 2021).

Symptoms: The symptoms of plants in response to feeding by *X. hunaniense* are like those of other migratory ectoparasitic nematodes: Poor overall growth and/or stunting of the plant, yellowing or wilting of the foliage, and damaged/reduced root systems, including root necrosis, lack of feeder or secondary roots, and occasional tufts of stubby rootlets (Chitambar et al., 2018).

Transmission: Natural spread through undisturbed soils is slow, likely less than 1 m per year. More important for spread is the movement of infected rooted plants and soil; cultural practices that result in the movement of infected soil to clean, non-infected sites, infected nursery stock, and contaminated irrigation water.

Damage Potential: Nematode feeding damages root cells. *Xiphinema* species use a long, sharp mouthpart called a stylet to puncture root cells from the outside while remaining in the soil. They inject digestive enzymes that break down cell contents, causing root tips to swell, form terminal galls,

or stop growing. Heavy feeding leads to necrotic (dead) root tissues, a lack of feeder roots, and an overall reduced root volume. Damaged roots restrict water and nutrient uptake, causing above-ground symptoms like yellowing, wilting, patchy crop fields, and stunted plant growth (Heve et al., 2018).

Worldwide Distribution: China, Taiwan, and Vietnam (Want and Wu, 1992; Chen et al., 2004; Nguyen et al., 2021).

Official Control: None

California Distribution: None

California Interceptions: One interception in Santa Clara County (see 'Initiating events').

The risk that *Xiphinema hunaniense* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This nematode is likely to be able to establish wherever its hosts are grown.

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

   Score: 3
   - Low (1) Not likely to be established 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:** This nematode is polyphagous, and the host range includes plants in multiple genera.

   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 are dependent on soil temperature and plant host. Long- and short-distance spread is mainly through infested soils accompanying plant stock, farm machinery, runoff and splash-contaminated irrigation water, and human and animal activity.

   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 reproductive and dispersal potential.

4) **Economic Impact:** Infestations of dagger nematodes result in lowered crop yield and value, and changes in cultural practices to mitigate the risk of spread to non-infested sites.

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

Economic Impact: A

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 *Xiphinema hunaniense* on natural environments is not known. However, infestations 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 *Xiphinema hunaniense:* High

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

Uncertainty:

It is likely the host range is larger than has been reported. In California, it could find new hosts such as additional fruit tree species.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for *Xiphinema hunaniense* is A.

References:

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Responsible Party:

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***Comment Period: 10/05/2026 through 11/19/2026**

***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.

Pest Rating: A
