

California Pest Rating Proposal for
***Pratylenchus speijeri* De Luca et al., 2012**
Lesion nematode

Current Pest Rating: Q

Proposed Pest Rating: B

Domain: Eukaryota, Kingdom: Metazoa,
Phylum: Nematoda, Family: Pratylenchidae

Comment Period: 10/13/2026 through 11/27/2026

Initiating Event:

In May 2025, a package shipped from a nursery in Puerto Rico to a resident of San Joaquin County was intercepted by the Yolo County Detector Dog team at the West Sacramento USPS facility. The package contained a banana plant with soil. A soil and root sample was submitted to CDFA's Plant Pest Diagnostics Center at Meadowview. CDFA Nematologist Sergei Subbotin identified, for the first time in California, *Pratylenchus speijeri*. The identification was made with DNA sequencing, and he assigned *P. speijeri* a temporary Q-rating. A notice of rejection was issued to the shipper and the receiver for multiple State Exterior quarantine violations, and the plant was destroyed. The risk to California from *P. speijeri* is described herein, and a permanent rating is proposed.

History & Status:

Background:

The root lesion nematodes of the genus *Pratylenchus* Filipjev, 1936 are migratory endoparasites of plant roots. They are considered among the most widespread and destructive genera of phytopathogenic nematodes of agricultural crops (Chitambar et al., 2018; Sasser and Freckman, 1987; Nemaplex, 2010). As a migratory endoparasite, this nematode can enter plant roots, feed, reproduce, and move freely within the tissue while spending its entire life cycle there. The species can also be found in the soil around roots. Within the roots, feeding is confined to the root cortex. Like other *Pratylenchus* species, *P. speijeri* has six life stages: egg, four juvenile stages, and adults. Reproduction requires both females and males, and males are common. First-stage juveniles develop within the egg, followed by a first molt to the second-stage juvenile, which hatches from the egg. Each stage develops into the next via a molt of its cuticle (outer body covering). All juvenile and adult stages are worm-

shaped (vermiform). All post-hatch stages are motile and can infect plants. Generally, root lesion nematodes have a life cycle of 45-65 days, but the duration is affected by temperature and moisture. *Pratylenchus* survives the winter in infected roots or soil as eggs, juveniles, or adults. During spring, when plants are growing, eggs hatch to commence the life cycle within roots or in the rhizosphere soil. Within the root, nematodes feed on cortical tissue, causing necrosis of cortical cells, cell breakdown, and formation of cavities. Necrosis is apparent as lesions that expand as the nematodes move lengthwise within the infected roots. Some nematodes may leave the root, enter the soil, and re-enter the root at a different site, causing a new infection.

Traditionally, taxonomists identified *Pratylenchus* species using physical traits with light microscopy, looking at the number of lip annules, the shape of the spermatheca, stylet length, and tail shape. For over a century, *P. coffeae* was treated as a single, highly adaptable pest with a massive global footprint and host range. However, as molecular tools advanced, nematologists realized that what was being identified broadly as *P. coffeae* was a species complex whose members are morphologically indistinguishable. *Pratylenchus* species can be difficult to identify because of this overlapping morphology and because public molecular databases may include misidentified sequences. Subbotin et al. (2008) developed a phylogenetic framework for *Pratylenchus* using partial 18S rRNA and D2-D3 expansion segments of 28S rRNA and showed that molecular phylogenies were generally congruent with several morphological character groups. *Pratylenchus coffeae* is B-rated (<https://blogs.cdfa.ca.gov/Section3162/?p=2208>).

DNA sequencing split *P. coffeae* into three distinct genetic lineages (clades). *Pratylenchus coffeae* (sensu stricto) is found globally across diverse hosts like coffee and yam. *Pratylenchus speijeri* is a highly pathogenic group isolated predominantly from banana in Ghana. Putative *Pratylenchus* sp. C1 is a separate unidentified lineage isolated from taro in Japan (De Luca et al., 2012). This division has serious implications for biosecurity and agriculture. By splitting the species complex, target-specific PCR-RFLP diagnostic tools can detect *P. speijeri* at border checkpoints, helping prevent a highly destructive banana pathogen from spreading unnoticed globally.

Pratylenchus speijeri has a limited known geographical distribution, primarily centered in parts of West Africa where banana and plantain are cultivated. The nematode was named in honor of Paul Speijer, a nematologist from the International Institute of Tropical Agriculture who died in a plane crash in 2000 while working on banana and plantain pests in West Africa. Because it was only formally identified and separated from the broader *P. coffeae* species complex in 2012, official records are still relatively uncommon compared to other root-lesion nematodes.

Hosts: *Acalypha indica* (Indian copperleaf), *Boerhavia diffusa* (red spiderling), *Brachiaria deflexa* (annual millet grass), *Laportea aestuans* (West Indian woodnettle), *Megathyrus maximus* (Guinea grass), *Musa* (banana), *Rottboellia cochinchinensis* (itch grass), *Sida acuta* (sida) (Brentu et al., 2013; Luca et al., 2012).

Symptoms: As a migratory endoparasite, *P. speijeri* tunnels through and feeds on the internal cortical tissues of the roots. Infected roots split open longitudinally and show yellowish streaks, which gradually expand, turning purple, then reddish-brown, and finally dark brown or black. From the

outside, infected primary and secondary roots appear black, decayed, and dried out due to damage to the outer cortex. Multiple lesions frequently merge (coalesce), completely girdling the root and causing the lower section of the root to die and slough off.

The plant is left with a severely stunted, drastically reduced root system lacking healthy feeder roots. The feeding wounds created by *P. speijeri* are entry points for soil-borne pathogens, accelerating full-scale root rot. Because the root system can no longer properly absorb water or nutrients, the visible parts of the plant display symptoms that mimic severe drought or nutrient deficiency. The most catastrophic structural symptom of a severe nematode infestation for banana is ‘toppling’. Because the nematodes destroy the primary anchor roots, the plant loses its physical stability in the soil and falls over. This often occurs near harvest under the increased weight of the fruit (Wang and Hooks, 2009).

Transmission: *Pratylenchus speijeri* most commonly spreads to new locations or non-infested fields through infected plant material. Bananas or plantains often use vegetative suckers or corms for propagation. If the parent plant is infected, the nematodes and their eggs are carried inside the root tissue or corm straight into the new field. Soil clinging to poorly sanitized tractors, plows, machetes, or footwear can carry adult nematodes, juveniles, or eggs from an infested field to a clean one. Regular tilling and plowing spread the nematodes outward from small, localized "hotspots" in a field, gradually expanding the area of disease (Davis and MacGuidwin, 2000).

Damage Potential: *Pratylenchus* is one of the most limiting nematodes of Musaceae production in the world. *Pratylenchus speijeri* causes severe mechanical and physiological damage to plantain and banana crops, directly resulting in large losses. In severe cases, the combination of root destruction and secondary diseases can cause total plant collapse and 100% crop loss (De Luca et al., 2012).

Worldwide Distribution: Ghana

Official Control: None

California Distribution: A recent California study of *Pratylenchus* diversity used morphology, morphometrics, and molecular markers, including 18S rRNA, D2-D3 of 28S rRNA, and COI gene sequences, to characterize California *Pratylenchus* species and did not report any detections of *P. speijeri* from California (Álvarez-Ortega et al., 2026), and there are no historical records (Nemaplex, 2010; Chitambar et al., 2018).

California Interceptions: One detection in a nursery plant shipment from Puerto Rico (see ‘initiating event’).

The risk that *Pratylenchus speijeri* would pose to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** This nematode is likely to be established wherever *P. coffeae* is found.
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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 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: The host range includes plants in several 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: Root-lesion nematodes are migratory endoparasites that reproduce in roots or soil and move between soil and roots during their life cycle (Castillo and Vovlas, 2007). *Pratylenchus speijeri* can be moved long distances in infested soil or water, rooted plants, nursery stock, turf, and contaminated equipment.

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: *Pratylenchus speijeri* is an economically important root parasite of bananas. Its feeding can cause cortical lesions, necrosis, reduced root function, and predisposition to secondary infection (Castillo and Vovlas, 2007; De Luca et al., 2012).

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

Economic Impact: A, B, D, G

- 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: 2

- 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.
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- 5) **Environmental Impact:** No strong evidence was found that *Pratylenchus speijeri* would cause major environmental impacts in California. Reported associations with grasses, turf, pasture vegetation, and fruit trees suggest possible effects, but no reviewed evidence indicates significant impacts to rare plants, native ecosystems, or restoration programs. It could affect cultural practices and home/urban gardening.

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 *Pratylenchus speijeri*: Medium

Add up the total score and include it here. **12**

- 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.
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- 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 = 12*

Uncertainty:

Pratylenchus coffeae is often detected in shipments of plants with soil from Puerto Rico. It is possible that *P. speijeri* has been identified as *P. coffeae* in the past by morphology, prior to DNA sequencing. This nematode could be established in more places around the world, and its host range is likely larger than currently documented.

Conclusion and Rating Justification:

Based on the evidence provided above, and in alignment with the rating for *P. coffeae*, the proposed rating for ***Pratylenchus speijeri* is B.**

References:

Álvarez-Ortega, S., Subbotin, S.A., Chitambar, J.J., Stanley, J.D., Inserra, R.N. and Mundo-Ocampo, M. 2026. Diversity of plant-parasitic nematodes of the genus *Pratylenchus* (Nematoda: Pratylenchidae) in California: descriptions of two new species and insights from phylogenetic analyses. *Diversity* 18(1), 45.

Brentu, F. C., Amoatey, C., Oppong, E., 2013. Weed hosts of the root-lesion nematode *Pratylenchus speijeri* in replanting sites cleared from nematode-infested plantain cv. Apantu-pa (*Musa* spp., AAB-group) fields in Ghana. *Nematropica*, 43(1) 91-96.

CABI Crop Compendium. 2026. *Pratylenchus speijeri*.

www.cabidigitallibrary.org/doi/full/10.1079/cabicompendium.119481 Accessed 9/10/26

Castillo, P. and Vovlas, N. 2007. *Pratylenchus* (Nematoda: Pratylenchidae): diagnosis, biology, pathogenicity and management. *Nematology Monographs and Perspectives* 6. Brill, Leiden, The Netherlands.

Chitambar, J. J., Westerdahl, B. B., and Subbotin, S. A. 2018. Plant Parasitic Nematodes in California Agriculture. In Subbotin, S., Chitambar J. (eds) *Plant Parasitic Nematodes in Sustainable Agriculture of North America. Sustainability in Plant and Crop Protection*. Springer, Cham.

Davis, E. L. and MacGuidwin, A. E., 2000. Lesion nematode disease. *The Plant Health Instructor*, DOI:10.1094/PHI-I-2000-1030-01.

De Luca F., Troccoli, A., Duncan, L. W., Subbotin, S. A., Waeyenberge, L., Coyne, D. L., Brentu, F. C., Inserra, R. N., 2012. *Pratylenchus speijeri* n. sp. (Nematoda: Pratylenchidae), a new root-lesion nematode pest of plantain in West Africa. *Nematology*, 14(8):987-1004.

Nemaplex. 2026. University of California, Davis. <http://nemaplex.ucdavis.edu/> Accessed 7/8/2026

Sasser, J.N. and Freckman, D.W., 1987. A world perspective on nematology: the role of the society. *Vistas on Nematology: A Commemoration of the Twenty-fifth Anniversary of the Society of Nematologists*, 1987, 7-14 ref. 2

Subbotin, S.A., Ragsdale, E.J., Mullens, T., Roberts, P.A., Mundo-Ocampo, M. and Baldwin, J.G. 2008. A phylogenetic framework for root lesion nematodes of the genus *Pratylenchus* (Nematoda): evidence from 18S and D2-D3 expansion segments of 28S ribosomal RNA genes and morphological characters. *Molecular Phylogenetics and Evolution* 48, 491-505.

Wang, K.H. and Hooks, C.R., 2009. Plant-parasitic nematodes and their associated natural enemies within banana (*Musa* spp.) plantings in Hawaii. *Nematropica*, pp.57-74.

Responsible Party:

Heather J. Martin, Primary Plant Pathologist/Nematologist, CDFA/PHPPS ECOPERS, 1220 N St Rm 221, Sacramento, CA 95814 Phone: (916) 654-1017, [permits\[@\]cdfa.ca.gov](mailto:permits[@]cdfa.ca.gov).

***Comment Period: 10/13/2026 through 11/27/2026**

*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
