CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Ditylenchus angustus (Butler) Filipjev 1936

rice stem nematode

Current Pest Rating: none

Proposed Pest Rating: A

Kingdom: Animalia; Phylum: Nematoda;
Class: Chromadorea; Order: Rhabditida;
Family: Anguinidae

Comment Period: 07/03/2026 through 08/17/2026

Initiating Event:

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

History & Status:

Background:

Rice is grown on approximately 500,000 acres in California. Production is concentrated in the Sacramento Valley, where approximately 95% of California rice is grown, with the balance in a few counties of the northern San Joaquin Valley. The total value of rice production in 2023 was almost $1B (CDFA Ag Statistics). California rice production yields can exceed 10,000 lbs./acre, which is 20% above the U.S. average for rice. Over 90% of the rice acreage in California is planted to medium grain varieties, with limited area planted to short and long grain varieties. California is unique among the U.S. rice-producing states in its geography, climate, and environmental regulations. The growing season is characterized by a Mediterranean climate with negligible rainfall, high solar radiation, and relatively cold night-time temperatures.

Ditylenchus angustus is a migratory plant-parasitic nematode that causes ufra disease of rice. The nematode was first described by Butler from rice in modern Bangladesh as *Tylenchus angustus* and was later transferred to the genus *Ditylenchus* by Filipjev. California surveys of rice have been conducted to look for foliar nematodes in the genus *Aphelenchoides*. Those surveys would also have detected *D. angustus*, but it has not been found (Chitambar et al., 2018). This genus has remained one of the most

problematic in systematics. Subbotin and Ryss (2024) proposed a narrower definition of *Ditylenchus* than that used in previous classifications of Anguinoidea. This genus included only plant-parasitic species. Ufra is one of the oldest documented nematode diseases of rice and has historically been considered an important constraint to rice production in parts of South and Southeast Asia. The disease is most associated with deepwater and irrigated rice production systems, where prolonged flooding favors nematode survival and dispersal (Butler 1913; CABI, 2021).

A notable biological characteristic of *D. angustus* is its ability to survive in unfavorable conditions in a quiescent, desiccation-tolerant state within dried rice tissues. Dormant nematodes may persist in crop residues, dried leaves, panicles, and seed-associated plant material until favorable moisture conditions return. Flood irrigation and seasonal inundation facilitate dispersal within rice-growing areas, allowing nematodes to move from infested residues to newly developing plants. The persistence of viable nematodes in dried plant tissues, including seed, is considered an important factor in the epidemiology and long-distance movement of ufra disease (USDA 1984; Lal and Lal, 2008; USDA CAPS 2016).

Although *D*. *angustus* has been reported from several species of *Oryza* and a limited number of grass hosts, economic damage is primarily associated with cultivated rice (*Oryza sativa*). Yield losses vary with cultivar susceptibility, environmental conditions, and timing of infection, but severe epidemics have resulted in extensive reductions in grain production in affected regions. Published reports have documented yield losses ranging from 20% to 90%, with complete crop failure occasionally reported under highly favorable conditions for disease development (CABI, 2021; USDA CAPS 2016).

Hosts: Rice, *Oryza* spp. are the principal hosts, including *O. sativa, O. alta, O. eichingeri, O. glaberrima, O. latifolia, O. meyeriana, O. minuta, O. nivara, O. officinalis*, and *O. rufipogon*, *and O. sativa.* There are additional grass hosts including *Echinochloa colona* (barnyard grass), *Leersia hexandra* (cut grass), *Sacciolepis interrupta* (cupscale grass), *and Triticum aestivum* (wheat) (Nemaplex, 2010).

Symptoms: Infestations may remain difficult to detect during early crop development because nematodes are concealed within leaf sheaths and developing tissues. During vegetative growth, infected rice may show chlorosis, malformed growth, white splash-like patches or speckling at the bases of young leaves, necrotic brown lesions on leaves and leaf sheaths, twisted young leaf bases, distorted leaf sheaths, swollen lower nodes, and irregular branching. Later symptoms include dark brown patches in fields, partial panicle emergence, panicles enclosed within swollen sheaths, sterile grains, empty panicles, and erect stems at harvest. Severely infected plants may die or produce few or no seeds (Bridge et al., 2005; USDA CAPS, 2016).

Transmission: Ditylenchus angustus occurs in above-ground rice tissues, including seeds. Spread through irrigation water is reported, and the nematode can remain dormant and resist desiccation until fields are flooded. USDA CAPS (2016) reported that numerous nematodes may be recovered from fresh rolled leaves or young inflorescences and that nematodes may require time to resume activity from dried panicles. Published evidence also reports recovery of live *D. angustus* from dried rice seed after harvest, supporting a seed-associated pathway (Prasad and Varprasad, 2002; Ibrahim and Perry, 1993), although this risk has also been characterized as not significant (Bridge and Starr, 2007; CABI, 2021).

Damage Potential: The nematode parasitizes above-ground portions of rice plants. Nematodes feed on meristematic tissues and developing floral structures, resulting in distortion of vegetative growth and suppression of grain production. *Ditylenchus angustus* is reported to cause substantial yield losses where it occurs. USDA CAPS (2016) summarized reported losses of 20–90% in India, 20–90% in Thailand, 50–100% in Vietnam, and 40–60%, occasionally 100%, in Bangladesh. USDA (1984) reported yield reductions of 20–90% in infected fields in Thailand and 40–60% losses in some deepwater rice fields in Bangladesh. These reported impacts are specific to *D. angustus* and rice.

Worldwide Distribution: Published sources report *D. angustus* from South and Southeast Asian rice-growing regions, including Bangladesh, India, Madagascar, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam (EPPO, 2026). ASTA PeDS lists the U.S. distribution as "not known to occur" (ASTA PeDS, 2024).

Official Control*:* *Ditylenchus angustus* is on the USDA PCIT's Harmful organism list for Argentina, Brazil, Cambodia, China, Colombia, Cuba, Ecuador, Egypt, French Polynesia, Honduras, Indonesia, Japan, Mexico, New Caledonia, Peru, Republic of North Macedonia, Taiwan, The Bolivarian Republic of Venezuela, The Republic of Korea, Timor-Leste, Uruguay, and Viet Nam (USDA PCIT, 2026). It is on the EPPO's A1 list for Argentina, Brazil, the Islamic Republic of Iran, and Uruguay. It is on the A2 list for Egypt, Asia and Pacific Plant Protection Commission, Comité de Sanidad Vegetal del Cono Sur, and Inter-African Phytosanitary Council. It is a quarantine pest for China, Mexico, the Republic of Korea, and the United States.

Rice seed and related rice commodities are subject to U.S. import restrictions. APHIS requires that imported rice seed be grown in quarantine for 12 months, inspected during growth and seed-head ripening, and be free from seed pests before release (APHIS, 2026).

California Distribution: none

California Interceptions: none

The risk that *Ditylenchus angustus* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** Rice is grown commercially in California and is the principal known crop host. However, establishment potential under California's specific rice-production environment is not highly probable.

   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:** Published crop host records are concentrated in *Oryza* spp., with a small number of other reported grass hosts.

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:** *Ditylenchus angustus* can build high populations in above-ground rice tissues, spread through irrigation water, survive desiccation in a dormant condition until fields are flooded, and is reported from dried seed.

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:** Published losses in affected rice-production systems are substantial, including reports of severe field-level losses. It is a quarantine pest for the U.S. and other countries.

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

Economic Impact: A, C, 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: **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:** Introduction could affect rice production and may increase reliance on phytosanitary sanitation, crop residue management, or nematode management practices. No direct natural-environment impact is documented here, beyond host grasses and rice agroecosystems.

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

Environmental Impact: D

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 *Ditylenchus angustus:* Medium

Add up the total score and include it here. **11**
-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* ***= 11***

Uncertainty:

There is disagreement in the literature about how likely this nematode is to spread with seed. California rice production systems are very different from those in Southeast Asia and may not allow the establishment of this nematode if accidentally introduced.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Ditylenchus angustus*** **is A.**

References:

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USDA Phytosanitary Certificate Issuance and Tracking System, Phytosanitary Export Database (PExD) Harmful Organisms Database Report. *Ditylenchus angustus*. Accessed 6/17/2026.

Responsible Party:

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*Comment Period: 07/03/2026 through 08/17/2026

*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
