CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Fusarium asiaticum O'Donnell, Aoki, Kistler & Geiser 2004

Current Pest Rating: Q

Proposed Pest Rating: C

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Sordariomycetes,
Subclass: Hypocreomycetidae, Order: Hypocreales,
Family: Nectriaceae

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

Initiating Event:

In January 2025, a Los Angeles County agricultural inspector submitted a sample of *Chamaedorea seifritzii* (bamboo palm) that was part of an incoming nursery shipment from the island of Hawaii. CDFA plant pathologist Wei Belisle isolated three pathogens and made the following determinations: Pink rot, *Nalanthamala vermoesenii*, was detected from stems in culture. *Colletotrichum fructicola* was detected from leaf spots in culture and confirmed by PCR and sequence analysis. *Fusarium asiaticum* was detected from leaf spots as well and confirmed by PCR and sequence analysis. *Fusarium asiaticum* is a known head blight pathogen of grains and a foliar pathogen of other hosts, and there are no California records. It is unknown if it is pathogenic on palms. She assigned it a temporary Q-rating. The risk to California from *Fusarium asiaticum* is described herein, and a permanent rating is proposed.

History & Status:

Background:

Fusarium head blight (FHB) is a major fungal disease of wheat, barley, and corn worldwide, resulting in significant yield losses as well as reduced grain quality from associated mycotoxins in infected grains (McMullen et al., 2012). FHB is caused by *Fusarium graminearum* (teleomorph *Gibberella zeae*), which was previously thought to be a single potentially panmictic species spanning six continents. This changed when genealogical concordance phylogenetic species recognition was done by Taylor et al. (2000). Species limits were investigated within the *Fusarium graminearum* clades through phylogenetic analyses of DNA sequences by O'Connell et al. (2011). Nine phylogenetically distinct species were resolved within the clades, consistent with a homothallic reproductive mode. Their proposed phylogeny supported a monophyletic and apomorphic origin of homothallism. They assigned a species

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rank for eight previously unnamed species within *F. graminearum* using fixed nucleotide characters. One in lineage 6 became *F. asiaticum*. *Fusarium asiaticum* is morphologically indistinguishable from *F. graminearum*, but these two species share conidial features that are slightly different from those of other species within the clade.

Hosts: Alocasia macrorrhizos (giant taro), *Bletilla striata* (Chinese ground orchid), *Cucumis melo* (melon), *Glycine max* (soybean), *Hordeum vulgare* (barley), *Ligusticum chuanxiong*, *Lolium multiflorum* (perennial ryegrass), *Nicotiana tabacum* (tobacco), *Oryza sativa* (rice), *Setaria italica* (foxtail millet), *Triticum aestivum* (wheat), *Triticum durum* (durum wheat), *Zea mays* (corn), and *Zizania latifolia* (Manchurian wild rice) (Farr and Rossman, 2026; Feng et al., 2025).

Symptoms: Symptoms of FHB on wheat spikes are most often observed after flower initiation (anthesis). Infected spikelets (segments of the head) prematurely die, becoming bleached (brown or straw-colored). Entire heads may be killed prematurely as the fungus colonizes tissues within the head. As FHB progresses, brown to gray areas may develop along the stem beneath the heads (peduncle). The seed will become shriveled, discolored, or may not develop at all. In barley, FHB symptoms begin as brown water-soaked lesions on the spikelets and may expand to adjoining spikelets. Susceptible varieties may have entire heads infected, but the spread of the fungus within the heads of barley occurs less frequently than in wheat.

Fungal sporodochia develop when wet, humid conditions persist late in the growing season. Orange to salmon-pink spore masses may be observed at the attachment of the small grain head to the stem, spikelet attachment to the rachis, or sometimes along the awns. Severely infected kernels ("tombstones") will be lightweight, chalky, pink to red, and often blown out with chaff during harvest. Under extremely favorable conditions, black fungal fruiting bodies (perithecia) may be observed on both wheat and barley, and are easily observed on corn residue (Ali et al., 2025).

Fusarium asiaticum causes tobacco root rot in China. Affected tobacco plants show characteristic symptoms, including brown to black lesions on the roots, epidermal sloughing in the root collar region, browning of xylem tissue, and chlorosis progressing to necrosis, accompanied by wilting in mid-to-lower leaves (Feng et al., 2025).

Transmission: Sexual spores (ascospores) from residue are the primary source of inoculum and are wind and rain-dispersed to open flowers in small grain crops. Asexual spores (conidia) from host residue do not travel long distances and are dispersed by rain splashes. Infections by the FHB fungus take place during prolonged periods of warm, wet, and humid weather (48 to 72 hours) during the flowering growth stages in small grains and corn. Residue from previous crops is an important source of inoculum (spores) for initial infection. If the environment remains conducive, the fungus continues to grow and sporulate, resulting in pale pink or salmon-colored masses (sporodochia). Seed transmission is a significant long-distance spread mechanism, introducing the pathogen into disease-free areas (Xu et al., 2021).

Damage Potential: Yield losses because of FHB can exceed 50 percent when conditions favor the disease; however, it poses a more significant threat to grain quality and to animal and human health.

FHB can reduce test weight, and the FHB fungus produces mycotoxins (such as deoxynivalenol (DON), vomitoxin (VOM), and nivalenol (NIV), which contaminate grain, increasing the likelihood for discounts or rejection of entire loads of grain (CABI, 2025).

Worldwide Distribution: Brazil, China, Iran, Japan, Republic of Korea, Nepal, United States (Louisiana) (Farr and Rossman, 2026; Gale et al., 2011).

Official Control*:* *Fusarium asiaticum* is not under official control. *Fusarium graminearum* is on the USDA PCIT's harmful organism list for the Syrian Arab Republic and Thailand, and a regulated non-quarantine pest in Egypt.

California Distribution: None as *F. asiaticum,* but there are official records of *F. graminearum* (now sensu lato) on a variety of hosts, including wheat, barley, and rye (CDFA PDR database, 2026; French, 1989).

California Interceptions: There has been an interception on a nursery shipment from Hawaii – see "initiating events".

The risk that *Fusarium asiaticum* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** Infection of hosts is influenced by temperature and moisture. Infection is favored by high temperatures (25-30 °C) and high relative humidity (above 85% RH) (CABI, 2026). These conditions may be found in greenhouses but are uncommon in the environment.

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

   Score: **1**
   - 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:** The host range includes plants in different families, both monocots and dicots.

   Evaluate the host range of the pest.

   Score: 2
   - 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:** This pathogen reproduces with multiple spore types and can be 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:** FHB can cause significant epidemics, and the detection of mycotoxins in very small amounts can disqualify fields for use as food for people or animals. *Fusarium asiaticum* produces the mycotoxin NIV and has been shown to cause FHB in Louisiana (Gale et al., 2011).

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

Economic Impact: A, B, F

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**: none

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

Environmental Impact:

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: 1

- **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 *Fusarium asiaticum:* Medium

Add up the total score and include it here. **10**
-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.

   Taxonomists have recently described *F. asiaticum* as a member of the *Fusarium graminearum* species complex. From existing records, it is not possible to know, if detected today, if strains would be called *F. graminearum* sensu stricto, *F. asiaticum*, one of the other new species names, or some combination.

   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 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* ***= 10***

Uncertainty:

Prior to 2011, *F. asiaticum* was not differentiated from the F. *graminarum* species complex. There is the possibility that this species may already have an established distribution in California.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for *Fusarium asiaticum* **is C.**

References:

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Xu, F., Liu, W., Song, Y., Zhou, Y., Xu, X., Yang, G., Wang, J., Zhang, J. and Liu, L., 2021. The distribution of *Fusarium graminearum* and *Fusarium asiaticum* causing Fusarium head blight of wheat in relation to climate and cropping system. Plant disease, 105(10), pp.2830-2835.

Responsible Party:

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***Comment Period: 02/06/2026 through 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: C
