cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Colletotrichum spinaciae Ellis & Halsted
Spinach anthracnose

Current Pest Rating: none

Proposed Pest Rating: C

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Sordariomycetes,
Subclass: Hypocreomycetidae, Order: Glomerellales,
Family: Glomerellaceae

Comment Period: 01/07/2026 – 02/21/2026

Initiating Event:

This fungal pathogen has not been through the pest rating process. It is an important pathogen for export seed certification of beets, sugar beets, Swiss chard, and spinach. The risk to California from *Colletotrichum spinaciae* is described herein, and a permanent rating is proposed.

History & Status:

Background:

Colletotrichum is a large ascomycete fungus genus comprising close to 200 species, many of which cause diseases on a large range of agricultural and horticultural crops worldwide. Species cannot reliably be separated using morphological traits, and a single species can have tremendous variation in pathogenicity depending on the host. Some hosts may be infected by multiple species of *Colletotrichum*, and some species of *Colletotrichum* are known to have dozens of hosts. *Colletotrichum* species can behave as endophytes, saprophytes, or necrotrophs. However, they most commonly act as hemibiotrophs, becoming pathogenic under favorable conditions (Cannon et al., 2012).

Colletotrichum (Glomerellaceae, Sordariomycetes) species with dark setae and curved conidia were often identified as *C. dematium* with a forma specialis corresponding to the host from which it was isolated. *Colletotrichum dematium* has been synonymized with many species. Von Arx (1957) recognized three distinct forms of *C. dematium*: *C. dematium* f. *truncatum* on legumes, *C. dematium* f. *spinaciae* on spinach, and *C. dematium* f. *circinans* on onions. A multilocus molecular phylogenetic analysis (ITS, ACT, Tub2, CHS-1, GAPDH, HIS3) of *C. dematium* and other *Colletotrichum* species with

curved conidia from herbaceous hosts resulted in 20 clades, with 12 clades containing strains that had previously been identified as *C. dematium*. *Colletotrichum dematium* is now considered to be a species complex, polyphagous, occurring on stems of various herbaceous hosts, but with many host-restricted parasitic forms. *Colletotrichum spinaciae* was restored to a species and assigned to 1 of 2 subclades in clade 4 (Damm et al., 2009).

Hosts: Beta vulgaris (beet), *Chenopodium album* (white goosefoot), *Medicago sativa* (alfalfa), *Portulaca oleracea* (common purslane), *Spinacia oleracea* (spinach), *Vicia sativa* (common vetch) (Farr and Rossman, 2025).

Symptoms: Symptoms on spinach begin as small, circular, water-soaked lesions. Leaves of all ages can be affected. Over time, the lesions expand, turning brown to tan in color and becoming thin and papery. Acervuli form in diseased tissues in large numbers and can help diagnose the disease in the field (Koike and LeStrange, 2012).

Transmission: Colletotrichum spinaciae forms thick-walled chlamydospores that act as survival structures, enabling the fungus to persist in soil or debris during unfavorable conditions and re-infect plants when conditions become favorable (Damm et al., 2012). The asexual conidia of the pathogen are spread by wind or rain and are strongly favored by wet conditions. Anthracnose survives on volunteer plants, dead leaves, and can be seed-borne (CABI, 2025).

Damage Potential: On spinach, if infection levels are very high, lesions can coalesce and result in severe foliage blight (Koike and LeStrange, 2012).

Worldwide Distribution: Australia, Canada, China, Germany, India, Italy, Japan, Netherlands, South Korea, Taiwan, Turkey, the United Kingdom, United States (*Arkansas, California, New Jersey, Oklahoma, Texas*) (Farr and Rossman, 2025; Correll et al., 1993).

Official Control*: Colletotrichum spinaciae* is on the USDA PCIT's harmful organisms list for Colombia and Ecuador (USDA-PCIT, 2025).

California Distribution: There are no official records. There is one published report from a commercial spinach field in Monterey County (Koike and Correll, 1993).

California Interceptions: none

The risk that *Colletotrichum spinaciae* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** Although present in the state for more than 30 years, it has only been seen sporadically in Monterey County. Disease development depends on very wet conditions and is worsened by a heavy canopy of densely planted crops, along with fields with low fertility.

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 several families.

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 is primarily spread with airborne spores, but may also be seed-transmitted.

Evaluate the natural and artificial dispersal potential of the pest.

Score: 2

- 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:** Infection with anthracnose negatively affects plant growth and yield. This is a quarantine pest for some countries.

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

Economic Impact: A, B, C

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 *Colletotrichum spinaciae:* Medium

Add up the total score and include it here. **9**
-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.

There is one published report from the UC Cooperative Extension on spinach in Monterey County. There are no reports from the desert where most sugarbeets are grown.

Evaluation is 'low'.

Score: -1
-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) **8**

Final Score: *Score of Consequences of Introduction – Score of Post Entry Distribution and Survey Information =*

Uncertainty: none

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Colletotrichum spinaciae*** **is C.**

References:

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Koike, S. T. and Correll, J. C. 1993. First report of Spinach anthracnose caused by *Colletotrichum dematium* in California. Plant Disease 77:318

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USDA Phytosanitary Certificate Issuance and Tracking System, Phytosanitary Export Database (PExD) Harmful Organisms Database Report. *Colletotrichum dematium* pv *spinaceae* and *Colletotrichum spinaciae*. Accessed 12/8/2025.

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.

***Comment Period: 01/07/2026 – 02/21/2026**

***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