CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Profile for

Colletotrichum higginsianum Saccardo 1917
Turnip anthracnose

Pest Rating: B

Domain: Eukaryota, Kingdom: Fungi, Phylum: Ascomycota, Subphylum: Pezizomycotina, Class: Sordariomycetes, Subclass: Sordariomycetidae, Family: Glomerellaceae

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Comment Period: 11/13/2025 through 12/28/2025

Initiating Event:

This pathogen has not been through the pest rating process. It is a pest of concern for export seed programs for crucifers. The risk to California from *Colletotrichum higginsianum* is described herein, and a permanent rating is proposed.

History & Status:

Background:

Colletotrichum is a large ascomycete 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 they 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 higginsianum was regarded as a synonym of *C. gloeosporioides* by von Arx (1957), but Sutton (1980, 1992) considered it as a distinct species based on its conidial morphology and consistent association with cruciferous hosts. O'Connell et al. (2004) recognized the similarity and relatedness with *C. destructivum* and regarded *C. higginsianum* as a synonym of *C. destructivum* based on ITS sequences. *Colletotrichum higginsianum* was confirmed as a distinct species resolved as a phylogenetic

clade within the *C. destructivum* complex by Damm et al. (2014), with a multilocus DNA sequence analysis (ITS, GAPDH, CHS-1, HIS3, ACT, TUB2).

Colletotrichum higginsianum causes anthracnose disease on a wide range of cruciferous plants. In addition to crop and weed species, it also infects the model plant *Arabidopsis thaliana*. The pathosystem formed between this pathogen and this host is regarded as a model for hemibiotrophic plant-fungus interactions (O'Connell et al., 2004; Yan et al., 2018).

Hosts: Armoracia lapathifolia (horseradish), *Boehmeria nivea* (ramie), *Brassica campestris* (field mustard), *B. campestris* subsp. *pekinensis* (napa cabbage), *B. campestris* var. *napobrassica* (rutabaga), *B. campestris* var. *purpuraria* (purple-leaved mustard), *B. chinensis* var. *parachinensis* (choy sum), *B. juncea* (brown mustard), *B. nigra* (black mustard), *B. oleracea* (wild cabbage), *B. oleracea* var. *capitata* (head cabbage), *B. rapa* (turnip), *B. rapa* subsp. *chinensis* (bok choy), *B. rapa* var. *komatsuna* (Japanese mustard spinach), *Eruca sativa* (arugula), *Lepidium draba* (hoary cress), *Matthiola incana* (stock), *Raphanus raphanistrum* (wild radish), *R. sativus* (radish) (Farr and Rossman, 2025).

Symptoms: *Colletotrichum higginsianum* causes mainly leaf spots but also attacks stems, petioles, seed pods, and even roots of host plants (Higgins, 1917). Symptoms are small, gray- to straw-colored circular spots on the leaves and petioles. Lesions on the stalks are sunken, elongated, and gray to brown with a black border (Damicone, 2014).

Transmission: No sexual morph or chlamydospores have been observed (Damm et al., 2014). 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 related weed hosts and can be seed-borne (CABI, 2025).

Damage Potential: The destruction of leaves reduces the plant's capacity for photosynthesis and overall vigor, while root damage makes the turnips or radishes unmarketable. In favorable environmental conditions (warm and wet), the fungus spreads quickly via splashing rain and can cause significant damage across the entire field. It can survive the winter in fallen leaves and on volunteer plants and weeds. This creates a source of infection for subsequent crucifer crops (Sumner et al., 1978).

Worldwide Distribution: Argentina, Canada, China, Guadeloupe, Hong Kong, Jamaica, Japan, Malaysia, Martinique, Puerto Rico, Romania, Samoa, Singapore, South Africa, South Korea, Sri Lanka, Taiwan, Trinidad and Tobago, Tunisia, United States (Alabama, Florida, Georgia, Mississippi, North Carolina, Oklahoma, Texas) (Farr and Rossman, 2025; Damm et al., 2014; CABI, 2025).

Official Control*: Colletotrichum higginsianum* is on the EPPO's A1 list for Brazil (EPPO, 2025). It is on the USDA PCIT's harmful organisms list for Australia, Brazil, Ecuador, and India (USDA-PCIT, 2025).

California Distribution: none

California Interceptions: none

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

Consequences of Introduction:

1) **Climate/Host Interaction:** This pathogen requires high rainfall and humidity to reproduce and spread, and is favored by warm temperatures. Coastal California, where many of the hosts are grown, has cooler winter temperatures than are needed for epidemics.

   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 is crucifers plus a few other species.

   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:** *Colletotrichum higginsianum* 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 higginsianum:* 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.

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* ***= 9***

Uncertainty:

none

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Colletotrichum higginsianum*** **is B.**

References:

Arx J.A. von. 1957. Die Arten der Gattung Colletotrichum Cda. Phytopathologische Zeitschrift. 29: 413–468.

CABI Compendium. 2025. *Colletotrichum higginsianum* https://www.cabidigitallibrary.org/doi/full/10.1079/cabicompendium.14913 Accessed 10/24/2025

Damicone, J., 2014. Diseases of leafy crucifer vegetables (collards, kale, mustard, turnips). Division of Agricultural Sciences and Natural Resources, Oklahoma State University. ID EPP-7666

Damm, U., O'Connell, R.J., Groenewald, J.Z. and Crous, P.W., 2014. The *Colletotrichum destructivum* species complex-hemibiotrophic pathogens of forage and field crops. Studies in mycology, 79(1), pp.49-84.

EPPO Database. 2025. https://gd.eppo.int/taxon/COLLHG. Accessed 10/23/25

Farr, D.F., and Rossman, A.Y. Fungal Databases, U.S. National Fungus Collections, ARS, USDA. Retrieved 10/23/2525, from https://nt.ars-grin.gov/fungaldatabases/

Higgins B.B. 1917. A *Colletotrichum* leafspot of turnips. Journal of Agricultural Research Washington; 10:157–162.

O'Connell, R., Herbert, C., Sreenivasaprasad, S., Khatib, M., Esquerré-Tugayé, M.T. and Dumas, B., 2004. A novel Arabidopsis-*Colletotrichum* pathosystem for the molecular dissection of plant-fungal interactions. Molecular plant-microbe interactions, 17(3), pp.272-282.

Sumner, D.R., Glaze, N.C., Dowler, C.C. and Johnson, A.W., 1978. Foliar diseases of turnip grown for greens in intensive cropping systems. Plant Disease Reporter, 62, pp.51-5.

Sutton B.C. 1980. Commonwealth Mycological Institute; Kew, Surrey, England: The coelomycetes. Fungi imperfecti with pycnidia, acervuli and stromata; pp. 1–696.

Sutton B.C. 1992. The genus *Glomerella* and its anamorph Colletotrichum. In: Bailey J.A., Jeger M.J., editors. Colletotrichum: biology, pathology and control. CAB International; Wallingford, UK: 1992. pp. 1–26

USDA Phytosanitary Certificate Issuance and Tracking System, Phytosanitary Export Database (PExD). Harmful Organisms Database Report. *Colletotrichum higginsianum.* Accessed 10/23/2025.

O'Connell, R., Herbert, C., Sreenivasaprasad, S., Khatib, M., Esquerré-Tugayé, M.T. and Dumas, B., 2004. A novel Arabidopsis-Colletotrichum pathosystem for the molecular dissection of plant-fungal interactions. Molecular plant-microbe interactions, 17(3), pp.272-282.

Yan, Y., Yuan, Q., Tang, J., Huang, J., Hsiang, T., Wei, Y. and Zheng, L., 2018. *Colletotrichum higginsianum* as a model for understanding host–pathogen interactions: a review. International journal of molecular sciences, 19(7), p.2142.

Responsible Party:

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***Comment Period: 11/13/2025 through 12/28/2025**

***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: B
