

California Pest Rating Proposal for
***Ascochyta rabiei* (Passerini) Labrousse**
chickpea blight

Current Pest Rating: none

Proposed Pest Rating: B

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Dothideomycetes,
Subclass: Pleosporomycetidae, Order: Pleosporales

Comment Period: 06/26/2024 through 08/10/2024

Initiating Event:

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

History & Status:

Background:

Garbanzo beans (chickpeas, *Cicer arietinum*) are an annual grain legume, or “pulse crop,” used extensively as food. They are an old-world species, originally from the Middle East, and garbanzos have been farmed since ancient times. They came to California during the Spanish Mission era. Garbanzo beans are mostly produced in California for canning as a premium specialty product. The large-seeded, dry-packaged garbanzo beans are also grown and California produces garbanzo seed for export worldwide.

Garbanzo beans are an annual, cool-season, winter-planted crop. With our comparatively warm, wet winters, California offers the perfect climate conditions for growing garbanzo beans. At one time garbanzos were extensively produced on the south-central coast of California but have been replaced by higher value crops. Today most garbanzo beans are grown in the Central Valley on approximately 10,000 acres (Long, 2019).

Ascochyta is coelomycete and its species cause diseases known as *Ascochyta* blights on legumes and wild relatives. The fungus, which is heterothallic, requires the presence of two compatible mating types for the teleomorph, or sexual stage, to form. Ascospores from the teleomorph are important in the

long-distance spread of the pathogen. *Ascochyta rabiei* has the teleomorph *Didymella rabiei*, which can develop on overwintering crop residue left in the field (Kaiser, 1973; Trapero-Casas and Kaiser, 1992a).

Ascochyta blight is the most important disease of garbanzo beans worldwide and has been recorded in nearly all countries that produce the crop (CABI, 2024). It was first reported in the United States in Washington State (Derie et al, 1985) and Idaho (Kaiser and Muehlbauer, 1984). The first report of *A. rabiei* infecting garbanzo beans in California was made by Guzman et al., in 1995. The disease is favored by cool, wet weather and can readily destroy garbanzo crops if left uncontrolled (Trapero-Casas and Kaiser, 1992b). The use of disease-free certified seed, seed treated with fungicide, or resistant varieties is important. Destruction and burial of crop residue and controlling volunteer garbanzo beans in and around fields helps to reduce disease pressure.

Hosts: *Cicer arietium* (garbanzo bean, chickpea), *C. montbretii*, *C. pinnatifidum*, *Medicago sativa* (lucerne), *Pisum sativum* (pea), *Trifolium alexandrinum* (Egyptian clover), *Vicia faba* (fava bean), and *Vigna unguiculata* (cowpea) (Farr and Rossman, 2024).

Symptoms: *Ascochyta rabiei* infects all aboveground plant parts, causing plants to turn yellow and die back. Symptoms include tan to dark brown lesions on leaves, stems, and pods. Brown lesions develop at the base of seedling stems that may lead to symptoms similar to damping-off. Lesions on stems cause them to weaken or break. Lesions on pods result in poor seed set. Pod infection may also lead to discoloration and shrinkage of the seed. Signs of the pathogen are brown to black pycnidia immersed in host tissue and arranged in concentric rings within the lesions. Conidia are straight, hyaline, and usually nonseptate. The teleomorph *Didymella* can be found in crop debris (Frate et al., 2018).

Transmission: The fungus is spread by infected seed and crop residues, long-range by the wind dispersal of sexually produced ascospores, or, within the crop, by water splashing of asexually produced pycnidiospores (CABI, 2024).

Damage Potential: *Ascochyta* blight is a damaging disease, and severe infections lead to general plant blight and decline. The first outbreak of this disease in Fresno County in 1994 led to 30% of the field being severely infected (Guzman, 1995). Infected plants collected from untreated fields had almost 60% losses in both pod number and total seed weight compared with uninfected plants in western Nebraska (Harveson, 2007). Saving seed for planting is risky because of seed-borne diseases such as *Ascochyta* blight and *Fusarium* wilt that can cause devastating stand and yield losses (CABI, 2024).

Worldwide Distribution: Africa: *Algeria, Egypt, Ethiopia, Libya, Morocco, Tanzania, Tunisia*. Asia: *Armenia, Azerbaijan, China, Georgia, India, Iran, Iraq, Israel, Jordan, Lebanon, Pakistan, Syria, Turkey, Uzbekistan*. Europe: *Bulgaria, Cyprus, France, Greece, Hungary, Italy, Moldova, Portugal, Romania, Spain, Ukraine*. North America: *Canada, United States* (California, Idaho, Nebraska, North Dakota, South Dakota, Washington). Oceania: *Australia*. South America: *Argentina* (CABI, 2024).

Official Control: is on the EPPO's A1 list for Brazil and Chile, a quarantine pest in Mexico (EPPO, 2024). It is on the USDA PCIT's harmful organisms list for Brazil, Chile, Ecuador, Israel, Mexico, Mozambique, Namibia, New Zealand, Pakistan, South Africa, the Syrian Arab Republic, The Republic of Korea, The

United Republic of Tanzania, and Uganda (USDA PCIT 2024). *Ascochyta* blight is in CDFA's Phytosanitary Field Inspection manual as a disease of concern for pea seeds grown for export.

California Distribution: There is one official record from Stanislaus County (CDFA PDR database). Guzman et al. (1995) reported a severe outbreak in Fresno County at the West Side Research and Extension Center, owned by UC Davis. The disease continues to occur in that area with a 2024 outbreak reported by UCCE advisor Nick Clark in the Five Points and Lemoore area (agnetwest.com).

California Interceptions: None

The risk that *Ascochyta rabiei* poses to California is evaluated below.

Consequences of Introduction:

- 1) Climate/Host Interaction:** This disease is favored by cool, wet weather. Garbanzo beans are a winter-sown crop and suitable conditions are likely to be found wherever they are grown.

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:** The pathogen infects multiple hosts in the legume family.

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 fungus reproduces by both conidia and ascospores. It can survive in crop debris and is spread with infected 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:** Once established in a growing area, disease management will need to include the use of blight-free seed, seed treatment fungicides, crop rotation, management of infested crop debris, and resistant cultivars to avoid large crop failures. Seed should not be harvested from infected fields.
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Evaluate the economic impact of the pest on California using the criteria below.

Economic Impact: A, B, C, D

- 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:

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 *Ascochyta rabiei*: 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
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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 are records from the San Joaquin Valley (Stanislaus and Fresno) but no other regions.

Evaluation is 'low'.

Score:

-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 = 10*

Uncertainty:

This disease is a target in our PQ Export seed program. If additional counties are included in the known distribution, it may affect the Post-Entry distribution score.

Conclusion and Rating Justification:

Based on the evidence provided above the proposed rating for ***Ascochyta rabiei* is B.**

References:

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Responsible Party:

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***Comment Period: 06/26/2024 through 08/10/2024**

***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.
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Proposed Pest Rating: B
