CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Profile for

Zasmidium citri-griseum (F.E. Fisher) U. Braun & P.W. Crous 2014
Greasy spot of citrus

Pest Rating: B

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Dothideomycetes,
Subclass: Dothideomycetidae, Order: Mycosphaerellales,
Family: Mycosphaerellaceae

Comment Period: 12/11/2025 through 01/25/2026

Initiating Event:

In May 2024, San Luis Obispo County agricultural officials inspected a high-risk shipment of *Gardenia jasminoides* 'Frost Proof' from Mobile County, Alabama. They submitted leaf samples with spots to CDFA's Plant Pest Diagnostics lab. Plant Pathologist Wei Belisle cultured from the leaf spots and recovered *Zasmidium citri-griseum*, which she diagnosed based on fungal morphology. She confirmed this diagnosis with PCR and sequence analysis. Pathogenicity was not confirmed on this host, and she assigned a temporary Z-rating. In November 2025, a second sample was submitted from San Luis Obispo County. The sample was *Cordyline* sp. with leaf spots collected at a retail nursery. *Cordyline* is also not a confirmed host for this fungus. The origin of the second sample was a wholesale nursery in Santa Cruz County. This pathogen has not been through the pest rating process. The risk to California from *Zasmidium citri-griseum* is described herein, and a permanent rating is proposed.

History & Status:

Background:

Greasy spot, caused by *Zasmidium citri-griseum*, is widespread in the Caribbean, eastern Mexico, Central America, and northern South America. The disease was first reported in Florida in 1915 by Fawcett, but that was many years before its fungal etiology was understood. Instead, it was attributed to mite injury, physiogenic factors, and a range of unidentified pathogens. Following Whiteside's work in the late 1960s and 1970s, the causal agent was described as *Mycosphaerella citri*, with *Stenella sp.* as the anamorph (Whiteside, 1970).

The ascomycete family Mycosphaerellaceae has a wide range of hosts and substrates. Fungi belonging to this family are characterized by producing pseudothecia, either submerged or superficially embedded in the plant tissue. The asci are typically ovoid and bitunicate, containing hyaline ascospores with a single septum. The Mycosphaerellaceae family includes many important genera of phytopathogens, such as *Cercospora, Cercosporella, Dothistroma, Mycosphaerella, Ramularia,* and *Zasmidium*. Most of them are leaf-spotting plant pathogens. They have undergone taxonomic and nomenclatural reassessment (Braun et al., 2014), and *M. citri* was reclassified as *Z. citri-griseum*.

Greasy spot is an economically significant foliar disease of citrus in Florida. The disease also occurs in other areas with similar warm, humid climates, including parts of Texas. The fungus produces slow-developing, oily lesions that cause premature defoliation and, subsequently, reduced yield and fruit size. Fruit infections produce dark specks on the fruit that coalesce to form a greasy spot rind blotch. Greasy spot is most serious on lemons and grapefruit but affects most citrus and its relatives (Mondal and Timmer, 2006).

Hosts: Acacia mangium (mangium), *Citrofortunella mitis* (calamondin), *Citrus aurantifolia* (key lime or Mexican lime), *Citrus aurantium* (bitter orange or sour orange), *Citrus grandis* (pomelo), *Citrus jambhiri* (rough lemon), *Citrus latifolia* (Persian lime or Tahiti lime), *Citrus limon* (lemon), *Citrus limonia* (rangpur lime), *Citrus paradisi* (grapefruit), *Citrus reticulata* (mandarin or tangerine), *Citrus sinensis* (sweet orange), *Citrus unshiu* (satsuma mandarin), *Eucalyptus camaldulensis* (river red gum), *Eucalyptus* spp., *Fortunella margarita* (kumquat), *Murraya paniculata* (orange jasmine or mock orange), *Murraya* spp., *Musa* spp. (banana or plantain), *Poncirus trifoliata* (trifoliate orange) (Farr and Rossman, 2025).

Symptoms: Foliar symptoms first appear as yellow spots on the upper surface of citrus leaves, with a corresponding slightly raised, pale orange to yellowish brown blister on the lower leaf surface. Later, the symptoms on both surfaces become darker brown or black, giving a 'greasy' appearance. Under grove conditions in Florida, infection of leaves occurs mostly in the summer rainy season, and symptoms develop in late fall or winter. Symptoms develop more rapidly when winter temperatures are warm (Whiteside, 1982). Citrus fruit exhibits necrotic specks in the epidermis between the oil glands. Symptoms on fruit are known as greasy spot rind blotch. These black specks can occur in splotchy areas scattered on the fruit or involve large areas of the fruit surface. On severely affected fruit, lesions coalesce and become sunken to form large pinkish-brown areas. This disease is most severe on grapefruit, but also occurs on oranges, mandarins, and other citrus fruits (Whiteside, 1970; Timmer and Gottwald, 2000).

Transmission: Infected leaves produce pseudothecia under favorable conditions. The major source of inoculum for greasy spot is wind-dispersed sexual spores (ascospores) produced during periods of wetness on decomposing fallen leaves. The disease cycle of this pathogen is unusual because most of the infection occurs on mature leaves. Ascospores are deposited on the leaf surface, where they germinate, and the fungus grows epiphytically for several weeks before penetrating the leaf. Conidia of the anamorph, *Stenella citri-grisea*, are produced in small numbers on the epiphytic hyphae, but are not thought to play a major role in the epidemiology of the disease (Timmer and Gottwald, 2000). In areas with high temperatures and high rainfall, the disease cycle continues year-round, and infection

may occur at any time. Fruit, even if infected, does not transmit the disease as *Zasmidium* does not sporulate on fruit. The pathogen is not seedborne, or budwood transmitted, and is not transmitted by vectors (CABI, 2025).

Damage Potential: Where greasy spot is endemic, excessive leaf loss can reduce yields up to 50% on susceptible species such as grapefruit (Whiteside, 1977). *Zasmidium citri-griseum* also produces greasy spot rind blotch on fruit, which reduces the acceptability of fruit for the fresh market. Citrus plantings in Florida need to be treated with fungicides to control the disease. Most of the leaves on unsprayed trees in the more humid tropical areas are lost each year prematurely, with a debilitating effect on tree growth. Fungicide applications must be made to produce high-quality fruit free of rind blotch. The disease occurs in Texas but does not cause serious damage because the climate is drier in Texas than in Florida and most other areas of the Caribbean Basin (Timmer et al., 1980). Symptomatic leaves abscise prematurely, and most of the greasy spot induced leaf drop occurs in late winter and early spring.

Worldwide Distribution: Africa: *Egypt, Gabon*. Asia: *China, Hong Kong, Indonesia, Japan, South Korea, Taiwan, Thailand, and Vietnam*. North America: *Costa Rica, Cuba, Dominica, El Salvador, Haiti, Mexico, Trinidad and Tobago, United States* (Florida, Puerto Rico, Texas, Virgin Islands). Oceania: *Australia, Tonga*. South America*: Argentina, Bolivia, Brazil*, *Paraguay, Venezuela*. (Farr and Rossman, 2025; CABI, 2025).

Official Control*: Zasmidium citri-griseum* is on the EPPO's quarantine pest list for Israel and Morocco (EPPO, 2025). It is on the USDA PCIT's harmful organisms list for Ecuador, Israel, Namibia, New Zealand, South Africa, Thailand, and the Republic of Korea (USDA-PCIT, 2025).

California Distribution: None in the environment, possibly in the ornamental nursery trade.

California Interceptions: One interception from Alabama, see 'initiating event'.

The risk that *Zasmidium citri-griseum* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** Development of greasy spot requires high temperatures and extended periods of high humidity with free moisture.

   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 mainly citrus, with a few reports from other hosts.

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 spreads with ascospores released by decaying leaf litter. It disperses inside orchards but has limited pathways for spread.

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:** This disease reduces yield, damages the cosmetic value of fruit, and is a quarantine pest in 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:** This disease has a significant impact on home orchards where it is established.

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

Environmental Impact: E

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 *Zasmidium citri-griseum:* 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.

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 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:

There have been 2 detections made by CDFA pathologists on ornamentals, *Gardenia* and *Cordyline*, from leaf spots. Pathogenicity tests have not been done to establish if these are hosts.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Zasmidium citri-griseum*** **is B.**

References:

Braun, U., Crous, P.W. and Nakashima, C. 2014. Cercosporoid fungi (Mycosphaerellaceae) 2. Species on monocots (Acoraceae to Xyridaceae, excluding Poaceae). IMA Fungus. 5(2):203-390

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Responsible Party:

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***Comment Period: 12/11/2025 through 01/25/2026**

***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.

Pest Rating: B
