

California Pest Rating Proposal for
***COLLETOTRICHUM LIRIOPES* (Damm, P. F. Cannon & Crous, 2009)**

Current Pest Rating: Q

Proposed Pest Rating: B

Comment Period: 7/11/2019 through 8/25/2019

Initiating Event:

On February 14, 2019, leaves of lilyturf, *Liriope* sp. (Asparagaceae), exhibiting leaf spotting symptoms, were collected by Santa Cruz County inspectors. The plants were inspected as an incoming shipment at a UPS sorting station and were destined to a residential address in Ben Lomond, California. The shipment was sent from Kentucky by an online shipper. Leaf samples were sent to the CDFA Plant Pathology Laboratory for diagnosis. On March 21, 2019, Suzanne Latham, CDFA plant pathologist, identified the pathogen *Colletotrichum liriopes*, as the cause for the leaf spots. The determination was made by fungal morphology in culture and confirmed by PCR analysis. The USDA National Identification Services in Beltsville, Maryland confirmed the identification and deposited the specimen in the USDA Herbarium, recording it as the first California detection and the first detection of this pathogen on *Liriope* in the United States. The pathogen was assigned a temporary “Q” rating. The risk of the introduction and establishment of *C. liriopes* is evaluated here and a permanent rating is proposed.

History & Status:

Background: *Colletotrichum liriopes* causes an anthracnose disease. This pathogen was first described in 2009 (Damm et al.), and it has been reported in the United States, China, and Korea, and it has been intercepted on shipments entering the United States from Mexico. In the United States, it has been reported from Tennessee on *Rohdea japonica* (Japanese sacred lily) and California on *Liriope* sp. (CDFA Pest Detection and Damage Records, 2019; see ‘Initiating Event’). A disease of *R. japonica* caused by a *Colletotrichum* sp. was previously reported on the northern coast of California (French 1989), but it is not known if this was *C. liriopes* or another *Colletotrichum* species.

Hosts: In Asparagaceae: *Liriope muscari* (Lilyturf) (Damm et al., 2009), *Liriope splicata* (spreading lilyturf) (Chen et al., 2019), and *Rohdea japonica* (Japanese sacred lily) (Kwon and Kim, 2013); in Orchidaceae: *Bletilli ochracea* (Chinese Butterfly) (Tao et al., 2012), *Eria coronaria* (crowned lip Eria),

Pleione bulbocodioides (Yang et al., 2011); and in Asphodelaceae: *Hemerocallis fulva* (daylily), (Yang et al., 2012).

Symptoms: Generally, *Colletotrichum* infects the aerial portion of the plant with the leaves being the part most often attacked. Leaf tips turn reddish-brown beginning at the apex and proceeding toward the base. There can also be reddish-brown spots along the leaf margins and stems and wilting of leaves, which often results in dieback and reduction in plant quality. Leaf dieback can be rapid (Clemson, 2014). By late fall when the plants are entering winter dormancy, it is common that anthracnose has consumed the entirety of the foliage (Wolf, 2019). Dark brown or light gray patches of fungal growth develop, sometimes as concentric rings, or as numerous dark bands across the leaf. The affected area is usually sharply defined and somewhat sunken, while the remainder of the leaf appears normal (Chase, 2011).

Transmission: It is likely that *Colletotrichum liriopes* has a very similar life cycle to that of other *Colletotrichum* species and survives between crops as mycelium on plant residue in soil, on infected plants, and on seeds. During active growth, the pathogen produces masses of hyphae (stromata) that bear conidiophores on the plant surface. Conidia (spores) are produced at the tips of the conidiophores and are disseminated by wind, rain, cultivation tools, equipment, and field workers. Conidia in mass may appear pink or salmon-colored. Conidia germinate and penetrate host tissue by means of specialized hyphae (appressoria). Humid, wet, rainy weather is necessary for infection to occur. These requirements may limit the occurrence of the pathogen in California fields and therefore, the pathogen may be more of a problem in the controlled environment of a greenhouse. *Colletotrichum* diseases spread by spores and can disperse via wind, splashing irrigation water or rainfall, and the movement of infected nursery stock and cultivation tools, and human contact (Agrios, 2005).

Damage Potential: Anthracnose disease caused by *C. liriopes* does not kill plants but can result in reduced plant quality and growth, and reduction in production and marketability due to discoloration of leaves. Estimates of yield/crop loss due to this pathogen on *Liriopes splicata* in China is high with 80-90% of leaves in one study showing anthracnose symptoms (Chen et. al. 2019). In Korea, this disease on *Rohdea japonica* is described as “spreading and poses a serious threat to these plants” (Oo and Oh, 2018). In California, nursery and greenhouse production of *Liriopse* and *Rohdea* are particularly at risk as growing conditions are often conducive to infection by *Colletotrichum* pathogens. In outdoor situations, including nurseries and ornamental plantings, disease development may be sporadic as it is affected by levels of pathogen inoculum and environmental conditions.

Worldwide Distribution: *Asia:* China, Korea; *North America:* Mexico, United States (Tennessee and California) (Farr and Rossman, 2019).

Official Control: In California, *C. liriopes* is a quarantine-actionable, Q-rated pathogen.

California Distribution: none

California Interceptions: Santa Cruz County (see “initiating event”).

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

Consequences of Introduction:

- 1) Climate/Host Interaction:** Like other species of *Colletotrichum*, *C. liriopes* requires humid, wet, rainy weather for the conidia to infect host plants. This environmental requirement may limit the ability of the pathogen to fully establish and spread under dry field conditions in California but would be often found inside production greenhouses.

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 establish in a larger but limited part of California.**
- High (3) likely to establish a widespread distribution in California.

- 2) Known Pest Host Range:** Presently, the host range of *Colletotrichum liriopes* is limited to a few plant species grown in California as ornamentals, but lilyturf is widely planted.

Evaluate the host range of the pest.

Score: 1

- **Low (1) has a very limited host range.**
- Medium (2) has a moderate host range.
- High (3) has a wide host range.

- 3) Pest Dispersal Potential:** The pathogen has high reproductive potential. Conidia are produced successively and are transmitted by wind, wind-driven rain, cultivation tools, and human contact, however, conidial germination and plant infection require long, wet periods.

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:** Under suitable wet climates, the pathogen could lower plant growth, flower production and value, and trigger the loss of markets. Nursery-grown hosts and could be negatively affected.

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

Economic Impact: A, B, D

- A. The pest could lower crop yield**
- B. The pest could lower crop value (includes increasing crop production costs).**
- C. The pest could trigger the loss of markets (includes 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:** The pathogen could trigger official or private fungicide treatments and significantly impact cultural practices or home garden plantings

Environmental Impact: D, 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: 3

- 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 liriopes* = Medium (12)

- Low = 5-8 points
- Medium = 9-12 points**
- High = 13-15 points

- 6) Post Entry Distribution and Survey Information:**

Evaluation is '0'.

Score: 0

- Not established (0) Pest never detected in California or known only from incursions.**
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-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 introduction score minus the post entry distribution and survey information score: 12

Uncertainty:

As it is a newly described species, the host range and known distribution of *Colletotrichum liriopes* may expand. Further host range studies are needed. Also, positive results of detection surveys for *C. liriopes* in nursery, commercial, and natural environments within California may alter its rating.

Conclusion and Rating Justification:

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

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Responsible Party:

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***Comment Period: 7/11/2019 through 8/25/2019**

*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 [plant.health\[@\]cdfa.ca.gov](mailto:plant.health[@]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.
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❖ 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: B
