CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Colletotrichum aotearoa B. Weir & P.R. Johnst. 2012

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Sordariomycetes,
Subclass: Sordariomycetidae, Order: Phyllachorales,
Family: Glomerellaceae

Current Pest Rating: Q

Proposed Pest Rating: B

Comment Period: 12/30/2020 through 02/13/2021

Initiating Event:

In March 2019, kentia palms (*Howea fosteriana*) plants were shipped from the Island of Hawaii to a wholesale nursery in San Diego County. County agricultural inspectors collected leaves with dark spots and sent them to CDFA's Plant Pest Diagnostics Center at Meadowview, California. CDFA Plant pathologist Suzanne Rooney-Latham detected in culture and confirmed by sequencing two genes the fungal pathogen *Colletotrichum aotearoa.* This was a first detection for the United States, and she assigned it a temporary Q rating. In June 2020, a second shipment of orchid plants, also from the Island of Hawaii, was inspected by Placer County agricultural inspectors and spots were observed on leaves. A representative sample was sent to CDFA. Plant pathologist Albre Brown again identified *C. aotearoa*. The risk to California from *C. aotearoa* is described herein and a permanent rating is proposed.

History & Status:

Background: *Colletotrichum aotearoa* is a distinct fungus species with a type strain isolated from *Coprosma* berries in New Zealand. The etymology is based on the Maori name for New Zealand. Most hosts are native New Zealand plants. It is included within the morphologically and physiologically variable *C. gloeosporioides* complex and is generally distinguished from other species of the complex only with DNA sequences. This species was placed in the Kahawae clade along with *C. ti*, *C. psidii*, *C. cordylinicola*, *C. clidermia*, *Glomerela cingulata* f.sp. *camelliae*, *C. kahawae* subsp. *ciggaro*, and *C. kahawae* subsp. *kahawae* by Weir et al. (2012).

Hosts: Banksia marginata (silver banksia)*, Berberis glaucocarpa* (great barberry), *Berberis* sp. (barberry), *Coprosma* sp., *Dacrycarpus dacrydioides* (kahikatea), *Dysoxylum spectabile, Geniostoma ligustrifolium* (hangehange), *Hedycarya angustifolia* (Australian mulberry), *Howea fosteriana* (kentia palm)*, Knightia sp.* (New Zealand-honeysuckle), *Kunzea ericoides* (white teatree)*, Ligustrum lucidum* (broadleaf privet)*, Lonicera japonica* (Japanese honeysuckle)*, Melicytus ramiflorus* (whiteywood)*, Meryta sinclairii* (pukanui)*, Musa* sp. (banana)*, Platostoma palustre* (black cincau)*, Podocarpus totara* (totara)*, Prumnopitys ferruginea* (miro), and *Vitex lucens* (puriri) (Farr and Rossman, 2020; CDFA database, 2020).

Symptoms: *Colletotrichum aotearoa* causes leaf and fruit spots. Generally, Colletotrichum-infected host plants exhibit symptoms of anthracnose which include dark brown leaf, stem, and fruit spots and wilting of leaves which often result in dieback and reduction in plant quality (Liu et al., 2013).

Transmission: It is likely that *Colletotrichum aotearoa* has a similar life cycle to that of other *Colletotrichum* species and survives between crops during winter 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 disseminated by wind, rain, cultivation tools, equipment, and field workers. Conidia are transmitted to host plants. Humid, wet, rainy weather is necessary for infection to occur. These requirements may limit the occurrence of the pathogen in California fields and subsequently, the pathogen may be more of a problem under controlled environments of greenhouses. Conidia germinate, penetrate host tissue by means of specialized hyphae (appressoria), and invade host tissue. Wind, wind-driven rain, cultivation tools, and human contact can move the pathogen.

Damage Potential: Anthracnose disease caused by *Colletotrichum aotearoa* can result in reduced plant quality and growth, fruit production, and marketability. Estimates of yield/crop loss due to this pathogen have not been reported. Nursery production of potted host plants or in greenhouses are particularly at risk as nursery conditions are often conducive to infection by *Colletotrichum* species. In cultivated fields, disease development may be sporadic as it is affected by levels of pathogen inoculum and environmental conditions.

Worldwide Distribution: Australia, India, New Zealand, Taiwan, United States (Hawaii) (Farr and Rossman, 2020).

Official Control: In California, *C. aotearoa* is an actionable, Q-rated pathogen, and infected plant material is subject to destruction or rejection.

California Distribution: None

California Interceptions: There have been two interceptions on incoming nursery stock from Hawaii (see 'Initiating event').

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

Consequences of Introduction:

1) **Climate/Host Interaction:** Similar to other species of *Colletotrichum, C. aotearoa* requires humid, wet, rainy weather for 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.

   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:** The hosts are all woody plants in several families. Many of the hosts are plants native to New Zealand but some are available in the nursery trades in the United States

   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:** The pathogen has high reproductive potential and conidia are produced successively. They 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:** Production of fruit and nursery grown ornamental plants can be limited by their susceptibility to anthracnose under wet conditions. Therefore, under suitable climates, the pathogen could lower plant growth, and fruit production and value and trigger the loss of markets.

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

   Economic Impact: A, B, C
   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 significantly impact cultural practices or home garden plantings.

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:
- 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 aotearoa:* Medium

Add up the total score and include it here. **12**
-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'. There have been two detections on incoming nursery stock that were intercepted by County inspectors

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 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* **= 12**

Uncertainty:

As a relatively newly described species that has been separated out from a larger species complex, it is likely that additional hosts will be added to the host list for this pathogen.

Conclusion and Rating Justification:

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

References:

Farr, D. F., and Rossman, A. Y. Fungal databases, systematic mycology and microbiology laboratory, ARS, USDA. Retrieved December 7, 2020, from http://nt.ars-grin.gov/fungaldatabases/

Liu, F., Damm, U., Cai, L., and Crous, P.W. 2013. Species of the *Colletotrichum gloeosporioides* complex associated with anthracnose diseases of Proteacea. Fung. Diversity 61: 89-105.

Weir, B.S., Johnston, P.R., and Damm, U. 2012. The *Colletotrichum gloeosporioides* species complex. Stud. Mycol. 73: 115-180.

Responsible Party:

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***Comment Period: 12/30/2020 through 02/13/2021**

***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: B
