

## California Pest Rating Proposal for

*Blumeriella jaapii* (Rehm) Arx 1961

cherry leaf spot

**Current Pest Rating: C**

**Proposed Pest Rating: C**

Domain: Eukaryota, Kingdom: Fungi,  
Phylum: Ascomycota, Subphylum: Pezizomycotina,  
Class: Leotiomycetes, Subclass: Leotiomycetidae,  
Order: Helotiales, Family: Dermateaceae

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**Comment Period: 01/05/2022 through 02/19/2022**

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### Initiating Event:

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

### History & Status:

**Background:** Cherries came to North America with English colonists and later were introduced to California by Spanish missionaries. In the 1800s, sweet cherries were planted in what have become their major sites of production in Washington, Oregon, and California. Today, California is the second largest cherry producing state in the U.S. behind Washington. California is also a large exporter of sweet cherries; 2019/20 statistics recorded 34,000 cherry acres with a total value close to \$200M, with \$85M in exports. The largest county for cherry orchards is San Joaquin, which primarily produces the traditional Bing variety. Most of the commercial acreage is found in the Central Valley from Sacramento to Bakersfield, with some coastal production between Morgan Hill and Hollister. Cherry production in Southern California is limited to low-chill varieties (calcherry.com; CDFA Ag Stats 2020).

Cherry leaf spot, caused by the fungus *Blumeriella jaapii*, affects all commercially grown cultivars of both sweet and tart cherries, but is a major disease of tart cherry (*Prunus cerasus*). Infection leads to early defoliation that results in uneven ripening and poor fruit quality in the current season, reduced fruit set in the following season, and an increased potential for winter injury and tree death. The disease is endemic in the Upper Midwest and the Pacific Northwest. It has been found occasionally in

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California, mainly on the coast. Humboldt and Mendocino counties have recorded severe infection on sweet cherry (White and Lai, 1984). There have been occasional detections in nurseries in Stanislaus County (CDFA PDR database). However, it has never been reported in orchards in the major sweet cherry growing areas of California's inland valleys (French, 1989).

The preferred scientific name for this pathogen is *Blumeriella jaapii* after the teleomorph, with the anamorph being *Cylindrosporium padi*. The name used prior to *B. jaapii* was *Cocomyces hiemalis* (teleomorph) with *Phloeosporella padi* (anamorph) (French 1989, CDFA PDR database, 2021).

*Hosts:* *Prunus americana* (American plum), *P. amygdalus* (almond), *P. angustifolia* (Chickasaw plum), *P. armeniaca* (apricot), *P. avium* (sweet cherry), *P. capuli* (capulan cherry), *P. caroliniana* (Carolina cherry laurel), *P. cerasus* (sour cherry), *P. demissa* (bitter-berry), *P. domestica* (common plum), *P. emarginata* (bitter cherry), *P. ilicifolia* (hollyleaf cherry), *P. laurocerasus* (cherry laurel), *P. mahaleb* (Mahaleb plum), *P. munsoniana* (Munson plum), *P. padus* (bird cherry), *P. pennsylvanica* (fire cherry), *P. persica* (peach), *P. pumila* (sand cherry), *P. salicina* (Chinese plum), *P. serrulata* (Japanese cherry), *P. serotina* (black cherry), *P. triloba* (flowering almond), *Prunus* sp., *P. virginiana* (choke cherry), *P. virginiana* var. *demissa* (western choke cherry) (Farr and Rossman, 2021).

*Symptoms:* The disease symptoms initially appear as small circular pinpoint purple-red lesions mainly on upper leaf surface, occasionally on the lower surface. The spots can appear from spring until late summer and will enlarge and coalesce, forming irregular necrotic patches. On sour cherry leaves, infected spots are irregular or round and occur over the entire leaf surface. Individual spots never become large; they merge to kill large areas of the leaf. The area adjacent to the spot may remain green while the rest of the leaf turns yellow (the "green island" effect). Diseased leaf tissue may separate from healthy tissue, drop out, and give the leaf a shot hole appearance. On sweet cherry leaves, spots often are larger and nearly circular. Cream-colored fungal spore masses appear on the lower leaf surface associated with the spots on both sweet and sour cherries. These whitish felt-like patches containing the conidiomata (acervuli) of the fungus and ooze out pink or whitish, *Cylindrosporium padi* conidia in mass. Infected leaves turn yellow and will defoliate prematurely by midsummer. On fruit stems, infections sometimes girdle the stem to cause a fruit drop. While infections occur on the fruit, they are less common than on foliage. Severely infected leaves can curl upward. In nurseries, the disease can cause severe defoliation on young trees (Pscheidt and Ocomb, 2020; Blumer, 1958; Higgins, 1914).

*Transmission:* The pathogen overwinters in leaves from the previous season that have fallen on the ground. In the spring, asci produce ascospores that are the primary inoculum. Ascospores are actively ejected up to 0.5 m and these spores are air-borne. The leaves are infected through the stomata (Eisensmith et al., 1982). After infection, the mycelium grows inside the leaf, followed by the development of conidiomata on the lower side. Macroconidia develop in large numbers in the conidiomata (Blumer, 1958). Water and rain splash spread these spores. The short incubation time of the disease and the fact that leaves are susceptible to infection the whole season allows for repeated epidemic cycles. Even if the inoculum level is low at the beginning of the year, two to three infection

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periods in a row can cause a serious epidemic (Keitt et al., 1937). Long distances spread can occur with infected nursery stock (CABI-CPC, 2021).

**Damage Potential:** In the Upper Midwest and Great Lakes region, fungicides are routinely applied to protect tart cherries from infection. Without treatment, there is a potential for significant infection and loss of cherry yield plus damage to the trees. The disease can affect fruit stems, and these infections can girdle the stem. Fruit can also be infected, but this is uncommon. If there is significant defoliation before harvest, the fruit can become soft, have low soluble solids, and ripen unevenly or fail to mature. In the Pacific Northwest, the disease is particularly severe on sour cherries, but it also attacks sweet cherries in western Oregon and Washington. It has been found infrequently in arid areas east of the Cascade Range in both states. It is especially problematic in newly planted orchards that are not yet being managed with fungicides to prevent brown rot. Resulting losses of fruit yield and quality are associated with early summer defoliation and a weakening of the tree. Early defoliation delays flower bud acclimation to low temperatures in winter, which results in decreased flower bloom and fruit set for 2 years (Pscheidt and Ocamb, 2020; Dutton and Wells, 1925).

**Worldwide Distribution:** Africa: *South Africa*; Asia: *Azerbaijan, Bhutan, China, Georgia, India, Pakistan, Turkey*. Europe: *Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, North Macedonia, Norway, Poland, Romania, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom*. North America: *Canada, United States (Arkansas, California, Connecticut, Florida, Georgia, Idaho, Indiana, Iowa, Massachusetts, Missouri, Montana, Michigan, Mississippi, Nebraska, New Jersey, North Carolina, Oklahoma, Oregon, South Dakota, Virginia, Washington (Farr and Rossman, 2021; CABI-CPC, 2021)*

**Official Control:** *Blumeriella jaapii* is on the USDA PCIT's harmful organism list for Canada, India, Republic of Korea, and South Africa (USDA, 2021).

**California Distribution:** 21<sup>st</sup> century detections are in Del Norte and Stanislaus counties. Older records are listed as "Coast North", "Coast South", and "Valley North".

**California Interceptions:** None

The risk *Blumeriella jaapii* would pose to California is evaluated below.

## Consequences of Introduction:

- 1) Climate/Host Interaction:** Water is necessary for the development of stroma and for a successful infection of leaves (Higgins, 1914). There is sufficient spring rainfall on the coast, especially the north coast, to result in epidemics (White and Lai, 1984), but insufficient rain in the Central Valley for disease.

Evaluate if the pest would have suitable hosts and climate to establish in California.

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**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:** Multiple *Prunus* sp. are hosts in addition to sweet and tart cherries. The following are susceptible California natives: *Prunus emarginata* (bitter cherry), *P. ilicifolia* (holly leaf cherry), *P. virginiana* (chokecherry), *P. virginia* var. *demissa* (western choke cherry) (CalFlora, 2021).

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:** When environmental conditions are favorable, with sufficient rainfall, the pathogen produces repeating cycles of conidia. Without adequate rainfall, the pathogen cannot reproduce or 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:** Early and repeated defoliation can result in dwarfed and unevenly ripened fruit with poor taste, devitalized trees that are more susceptible to winter injury, death of fruit spurs, reduction of fruit set and size, small and weak fruit buds, reduced fruit growth, and eventual death of the tree. It is a quarantine pest in some countries. In areas with climates conducive to disease, multiple fungicide applications are needed to protect trees.

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**

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- 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:** *Prunus emarginata* (bitter cherry), *P. ilicifolia* (holly leaf cherry), *P. virginiana* (chokecherry), *P. virginia* var *demissa* (western choke cherry) are California natives and recorded hosts of this pathogen in California. Home gardeners need to use a combination of fungicide treatments and sanitation to reduce inoculum and protect trees.

Evaluate the environmental impact of the pest to California using the criteria below

**Environmental Impact: A, 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 *Blumeriella jaapii*: 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 'medium'.**

**Score: -2**

- 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).
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**-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 = 10*

### **Uncertainty:**

This fungus has been treated as a C-rated pathogen for decades with limited official records along the coast and “valley north”. It has not been a target of surveys, nor has it been a reportable pest or under regulation outside of nurseries, where a standard of commercial cleanliness is enforced.

### **Conclusion and Rating Justification:**

Based on the evidence provided above the proposed rating for *Blumeriella jaapii* is C.

### **References:**

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### Responsible Party:

Heather J. Scheck, Primary Plant Pathologist/Nematologist, CDFA/PHPPS ECOPERS, 1220 N St Rm 221, Sacramento, CA 95814 Phone: (916) 654-1017, [permits\[@\]cdfa.ca.gov](mailto:permits[@]cdfa.ca.gov).

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**\*Comment Period: 01/05/2022 through 02/19/2022**

### \*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).

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### 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.]

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❖ 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: C**

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