California Pest Rating Proposal for

Pseudomonas cannabina pv. *cannabina* (Sutic & Dowson) Bull, Manceau, Lydon, Kong, Vinatzer & Fischer-Le Saux 2010

Leaf spot of hemp

Current Pest Rating: none

Proposed Pest Rating: B

Kingdom: Bacteria, Phylum: Proteobacteria,
Class: Gammaproteobacteria, Order: Pseudomonadales,
Family: Pseudomonadaceae

Comment Period: 01/07/2026 through 02/21/2026

Initiating Event:

This pathogen has not been through the pest rating process. It is an important pathogen for export seed certification for hemp. The risk to California from *Pseudomonas cannabina* pv. *cannabina* (Pcc) is described herein, and a permanent rating is proposed.

History & Status:

Background:

Hemp or industrial hemp means an agricultural product, whether growing or not, composed of or derived from *Cannabis sativa* and any part of that plant, including seeds, derivatives, extracts, resin, cannabinoids, isomers, acids, salts, and salts of isomers, with a delta-9 tetrahydrocannabinol (THC) concentration of no more than 0.3 percent on a dry weight basis (CA FAC 8100). In California, hemp can be cultivated by registered growers, hemp breeders, and established agricultural research institutions. Hemp has diverse uses, from building materials and textiles to food products and biofuels. Its fibers are used for fabric, paper, and composites, while the seeds are processed into oil for food, cosmetics, and lubricants, or consumed directly by people as hemp seeds or hemp milk, and as hempseed meal by animals. The woody core can be used for animal bedding, mulch, and as a component in building blocks, while CBD oil extracted from the flowers is used in wellness products.

California had approximately 3000 acres of hemp in 2024 with a value of $5M. It is second only to Oregon in floral hemp acreage (NASS National Hemp Report, 2025). Floral hemp is used to produce hemp oil and cannabidiol (CBD). Fresno County is the largest producer of hemp in California.

In 1959, Šutič and Dowson published their investigation of a serious disease of hemp (*Cannabis sativa*) in Yugoslavia. They described a pathogen and gave it the name *Pseudomonas cannabina*. In 1980, Dye et al. changed the names of many *Pseudomonas* species to make them pathovars of *P. syringae*. The pathogen described by Šutič and Dowson became *P. syringae* pv. *cannabina*.

The *Pseudomonas syringae* species complex forms a monophyletic group (clade) in the *Pseudomonas fluorescens*-like division of *Pseudomonas*. *Pseudomonas syringae* strains are split into 13 phylogroups. Strains of *P. syringae* have been subdivided into more than 60 pathovars based on the host of original isolation, host range, and biochemical properties. *Pseudomonas syringae* pathogenicity is strongly influenced by external environmental conditions, such as humidity and temperature, and the other microbiota that live on plants (Dye et al., 1980; Young et al., 1978; Young, 1991).

Following a comprehensive genetic analysis based on DNA/DNA hybridization, carbon source utilization, and ribotyping, Gardan et al. (1999) divided *P. syringae* into 9 genomospecies. *Pseudomonas syringae* pv. *cannabina* was placed in group 9 by itself, and it was elevated to *P. cannabina* sp. nov. because it differed phenotypically from the other genomospecies of *P. syringae* in that it did not assimilate fumarate, D(+)-malate, succinate, and DL-lactate. Bull et al. (2010), using phenotypic analysis and DNA sequence similarities, concluded that *P. syringae* pv. *alisalensis* should be moved to *P. cannabina*. They amended *P. cannabina* to contain two distinct pathovars, naming them *P. cannabina* pv. *cannabina*, for strains that were pathogenic and highly specific to hemp, and *P. cannabina* pv. *alisalensis* for strains pathogenic to a range of monocots and dicots, but not hemp.

Hosts: Cannabis sativa (hemp) (Bull et al., 2010).

Symptoms: Typical of other leaf-spotting pseudomonads, small, water-soaked leaf spots appear first. The spots are circular to irregular and often occur near leaf margins or along veins. Under humid conditions, the leaf surface may appear slightly greasy or translucent. Infected leaves become yellow, followed by the development of small (<2 mm in diameter), angular, water-soaked, and eventually, shot-holed spots. Occasionally, water-soaked streaks appear on petioles or stems (Šutič and Dowson, 1959; CABI, 2025; McPartland et al., 2000).

Transmission: Information specific to Pcc is not available; however, similar to other leaf-spotting Pseudomonads, it is likely spread by rain splash, wind-blown rain, and seed (CABI, 2025).

Damage Potential: There is no specific information available regarding crop losses from this pathogen. For similar species, leaf spots reduce photosynthesis and crop yield. Secondary pathogens can colonize tissues initially attacked by leaf-spotting pseudomonads.

Worldwide Distribution: Bulgaria, Hungary, Italy, Yugoslavia (Bradbury, 1986; Bull et al., 2010; EPPO 2025).

Official Control: *Pseudomonas cannabina* pv. *cannabina* is on the USDA PCIT's harmful organisms list for Australia, Canada, Colombia, New Zealand, and Peru (USDA-PCIT, 2025).

California Distribution: none

California Interceptions: none

The risk that *Pseudomonas cannabina* pv. *cannabina* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** Moisture, high relative humidity, and prolonged leaf wetness are essential. These conditions can occur inside dense plant canopies. *Pseudomonas* spp. thrive in moderate to cool temperatures (55 – 70 °F).

   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 host range is limited to *Cannabis.*

   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 Reproductive Potential:** Under favorable environmental conditions, *Pseudomonas* spp. can invade and reproduce at a rapid rate. They can be dispersed by rain and wind.

   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:** Similar to other foliar leaf spot pathogens, disease damage can reduce yield and require bactericide treatments, modification in irrigation, or changes to resistant varieties. This pathogen is a quarantine pest for some trading partners.

   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:** None have been reported, and this is a regulated crop that is not grown outside of permitted locations.

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 *Pseudomonas cannabina* pv. *cannabina:* 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 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:

As the number of hemp samples submitted for diagnostics in seed certification programs increases, this disease may be detected in California.

Conclusion and Rating Justification:

Based on the evidence provided above the proposed rating for ***Pseudomonas cannabina* pv. *cannabina* is B.**

References:

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Bull, C.T., Manceau, C., Lydon, J., Kong, H., Vinatzer, B.A. and Fischer-Le Saux, M., 2010. *Pseudomonas cannabina* pv. *cannabina* pv. nov., and *Pseudomonas cannabina* pv. *alisalensis* (Cintas Koike and Bull, 2000) comb. nov., are members of the emended species *Pseudomonas cannabina* (ex Šutič & Dowson 1959) Gardan, Shafik, Belouin, Brosch, Grimont & Grimont 1999. Systematic and applied microbiology, 33(3), pp.105-115.

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Young, J. M. 1991. Pathogenicity and identification of the lilac pathogen, *Pseudomonas syringae* pv. *syringae* van Hall 1902. Ann. Appl. Biol. 118, 283–298

Responsible Party:

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*Comment Period: 01/07/2026 through 02/21/2026

*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.

Proposed Pest Rating: B