

California Pest Rating Profile for

Puccinia pittieriana Henn. 1904

common rust of potato

Pest Rating: A

Kingdom: Fungi, Phylum: Basidiomycota,
Class: Pucciniomycotina, Subclass:
Pucciniomycetes, Order: Pucciniales, Family:
Pucciniaceae

Comment Period: **06/19/2026 through 08/03/2026**

Initiating Event:

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

History & Status:

Background:

Rust fungi are obligate parasites that must have a living host to parasitize. *Puccinia* spp. can have complex life cycles involving up to five types of spores produced annually and sequentially. The five types of spores are: stage 0: spermogonia-bearing spermatia, stage I: aecia-bearing aeciospores, stage II: uredinia-bearing urediniospores, stage III: telia-bearing teliospores, and stage IV: basidia-bearing basidiospores. All five spore types of a given species can occur on a single host (i.e., rose rust); alternatively, the different spore types of a species can colonize two very disparate hosts in a strict, alternating sequence (e.g., cedar-apple rust). Many of the rusts important to agronomic crops have evolved much simpler life cycles, with all stages of spore production occurring on a single host and often with fewer than five spore stages. These are called microcyclic (i.e., an abbreviated life cycle with fewer than five spore stages) rusts. Some have only uredinia (e.g., hollyhock rust), or telia and basidia (e.g., chrysanthemum white rust) (Agrios, 2005).

Puccinia pittieriana was first found in Costa Rica on cultivated potato in 1903 and 1904 by Pittier (Arthur, 1920), and it was formally described by Hennings (1904). The disease is indigenous to Central

and South America, where it occurs in mountain valleys, mostly between 2700 and 3800 m. Its life cycle is completed on the same host plant, and it requires cool and moist climatic conditions.

Potato rust is a microcyclic rust without a known alternate host, which has two spore stages, teliospores and basidiospores. At temperatures below 15 °C, the teliospores germinate to produce basidia and basidiospores, which greatly increases inoculum (French, 1981). Signs on *Solanum* spp. include rusty brown erumpent rust pustules, primarily on the leaves. These pustules produce thousands of spores. Spores can autoinfect the same plant or move short or long distances with air currents to other susceptible plants. Under favorable environmental conditions, multiple cycles of infection, sporulation, and reinfection can produce very destructive epidemics within a few weeks.

Around 30 rust species infect Solanaceae plants; however, *Puccinia pittieriana* is the only telial rust known on cultivated tomatoes and potatoes (Otálora and Berndt, 2020). *Puccinia pittieriana* was formerly considered the exclusive causal agent of the rust disease in cultivated and wild potatoes; however, a recent study revealed that *Puccinia telimutans* is the species causing the disease in wild potatoes in Mexico (Otálora and Berndt, 2019).

Puccinia pittieriana was formerly considered the exclusive causal agent of the rust disease in cultivated and wild potatoes; however, a recent study revealed that *Puccinia telimutans* is the species causing the disease in wild potatoes in Mexico (Otálora and Berndt, 2019). When there are overlapping host ranges, and when the distribution is now uncertain, it's very important that pathogens be identified by an expert Mycologist.

Hosts: *Lycianthes radiata* (bitter), *Solanum lycopersicum* (tomato), *Solanum nigrum* (nightshade), *Solanum tuberosum* subsp. *andigenum* (Andean potato) and *Solanum tuberosum* (potato) (Farr et al., 2026; EPPO Datasheet, 2022).

Symptoms: Lesions begin as small, round, greenish-white spots on the underside of leaves. They later become cream colored with reddish centers that turn tomato-red and finally rusty-red to coffee-brown. The lesions protrude by 1-3 mm, with corresponding depressions on the upper leaf surface, and may be surrounded by chlorotic or necrotic halos. Defoliation results when hundreds of lesions form on a leaf. Elongated or irregular lesions occur on petioles and stems; flowers are also affected, but tubers are not. In highly affected crops, there is a complete yellowing of the leaves followed by defoliation (Molina Valero, 1997; French, 2001).

Transmission: The pathogen has a microcyclic life cycle that only involves teliospores and basidiospores. Basidiospores are wind-borne (French, 2001). Teliospores may be carried in crop debris or in soil (CABI, 2026). Inoculum spreads from earlier sown crops or wild hosts (Laundon and Rainbow, 1971). Potato tubers and tomato fruit are not a pathway for the disease to move to new areas.

Damage Potential: Losses have not been quantified in any of the countries in which common rust has been reported, but *P. pittieriana* only appears to be an issue for potato production in northern Ecuador, sometimes in Colombia, and only rarely in Peru (Velastegui, 1991).

Worldwide Distribution: Colombia, Costa Rica, Mexico, Peru, Venezuela (EPPO datasheet 2022)

Official Control: *Puccinia pittieriana* is on the USDA PCIT's Harmful organism list for Albania, Antarctica, Argentina, Brazil, Chile, Egypt, European Union, Holy See (Vatican City State), Honduras, Indonesia, Israel, Japan, Jordan, Kosovo, Madagascar, Monaco, Morocco, Nicaragua, Norway, Republic of North Macedonia, Oman, Qatar, San Marino, Serbia, Taiwan, The Republic of Türkiye, Timor-Leste, United Arab Emirates, and United Kingdom (USDA-PCIT 2026). It is on the EPPO's A1 list for the Asia and Pacific Plant Protection Commission, Bahrain, Chile, Egypt, European Plant Protection Organization, Inter-African Phytosanitary Council, Jordan, Serbia, Switzerland, Türkiye, United Kingdom, and is a quarantine pest for the European Union, Israel, Morocco, Norway, and Tunisia (EPPO, 2026). It is a US-regulated pest (<https://www.aphis.usda.gov/plant-imports/regulated-pest-list?page=1>).

California Distribution: none

California Interceptions: none

The risk that *Puccinia pittieriana* would pose to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** Disease spread is favored by cool conditions. An average temperature of 10°C with 10-12 h of free moisture are optimal for epidemics (EPPO, 2022).

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 a few species of Solanaceae.

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:** The pathogen spreads with 2 types of windblown spores. Tubers and fruits are not 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.**
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- High (3) has both high reproduction and dispersal potential.

- 4) **Economic Impact:** Heavy infection can reduce plant growth and yield. It is an important quarantine pest for many 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:** A detection in California would likely trigger an eradication project. The susceptibility of native *Solanum* spp. is unknown.

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

Environmental Impact: A, D

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 *Puccinia pittieriana*: Medium

Add up the total score and include it here. **11**

-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 = 11*

Uncertainty:

none

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Puccinia pittieriana*** is **A**.

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***Comment Period: 06/19/2026 through 08/03/2026**

*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](mailto: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: A
