cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Profile for

Uromyces beticola (Bellynck) Boerema, Loer. & Hamers 1987

Synonym: *Uromyces betae* (Pers.) Tul.

Beet Rust

Pest Rating: C

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

Comment Period: 09/10/2026 through 10/25/2026

Initiating Event:

Uromyces beticola is an important pathogen for export certification of beet seed. This pathogen has not been through the pest rating process. The risk posed by *U. beticola* to California is described herein, and a permanent rating is proposed.

History & Status:

Background: California produced approximately 1.35 million tons of sugar beets from 28,200 harvested acres in 2024, with a farm-gate value of approximately $89 million. The state also produced table beets on approximately 1,500 acres, with a value of approximately $27.6 million. Sugar beet production has historically been concentrated in the Imperial Valley and portions of the Central Valley, while table beets and Swiss chard are produced commercially and in home gardens throughout the state (USDA NASS, 2025). However, the last sugar beet processing facility located in Brawley closed in 2025, leaving the future of sugar beet production uncertain.

This fungus was originally described as *Uredo beticola* by Bellynck in 1861. Boerema et al. 1987 transferred it to *Uromyces* as *U. beticola*. An older name, *Uromyces betae,* remains common in literature and is currently preferred by EPPO and Index Fungorum. Search for distribution, hosts,

biology, and regulatory records under both names (Boerema et al., 1987; MycoBank, 2026; EPPO, 2026).

Beet rust has been studied primarily as a production disease of sugar beet and other cultivated forms of *Beta vulgaris*. *Uromyces beticola* has a cosmopolitan distribution in temperate and subtropical regions where beets are cultivated. It was first reported on sugar beet crops in Canada in 1935 (Newton and Peturson, 1943), with significant emergence as a crop disease in parts of Europe. *Uromyces beticola* is an obligate biotrophic rust fungus. It is autoecious, completing its life cycle on *B. vulgaris* without requiring a taxonomically unrelated alternate host. Urediniospores are responsible for repeated asexual infection cycles during the growing season (Kaczmarek et al., 2019; Kristoffersen et al., 2018; McMullan et al., 2025).

Hosts: Beta maritima (sea beet), *B. patellaris* (beet), *B. procumbens* (wild beet), *Beta* sp. (beet), *B. vulgaris* (common beet), *B. vulgaris* subsp. *cicla* (leaf beet), *B. vulgaris* subsp. *maritima* (sea beet), *B. vulgaris* subsp. *rapacea* (fodder beet), *B. vulgaris* subsp. *vulgaris* (cultivated beet), *B. vulgaris* var. *cicla* (Swiss chard), *B. vulgaris* var. *hortensis* (garden beet), *B. vulgaris* var. *macrorrhiza* (stock beet), *B. vulgaris* var. *rapacea* (fodder beet) (Farr et al., 2026).

Symptoms: Uredinial infections produce small reddish-brown to rust-colored pustules on leaves. Pustules may occur on either leaf surface and can also develop on petioles and seed stalks. The epidermis ruptures over mature uredinia, exposing masses of powdery urediniospores. Dark brown telia may develop on older leaves near the end of the growing season (Pscheidt and Ocamb, 2026). Under severe disease pressure, pustules may become numerous, affected foliage may senesce prematurely, and substantial portions of the tops may be destroyed. Destruction of the tops can interfere with lifting or harvesting beet roots. Loss of photosynthetically active foliage can also reduce root growth and sugar accumulation (Kristoffersen et al., 2018).

Transmission: Airborne urediniospores are the principal means of natural spread during the crop season. Urediniospores produced in foliar pustules repeatedly infect susceptible beet plants and allow disease to increase through multiple secondary cycles. Kaczmarek et al. 2019 detected *U. beticola* inoculum on air-sampling tapes collected from a sugar beet field between June and September, directly supporting airborne dispersal as an epidemiologically important pathway (Kaczmarek et al., 2019; McMullan et al., 2025).

Wild, volunteer, or overwintered beet plants can maintain the obligate pathogen between commercial beet crops. Infected leaves, petioles, seed stalks, transplants, or other living beet material could transport viable uredinia or telia. Infected crop debris has also been identified as a possible local source of inoculum, although living hosts are particularly important because the pathogen is an obligate biotroph (Kristoffersen et al., 2018; McMullan et al., 2025). A survey of beet seeds imported to India found that lots from multiple countries were positive for *U. beticola* (Agarwal et al., 2006).

Damage Potential: Beet rust is frequently a late-season disease and may cause little measurable loss when infection develops after most root growth and sugar accumulation have occurred. Potential losses include reduced root weight, reduced sugar yield, premature leaf loss, harvesting difficulties,

and costs associated with monitoring, sanitation, cultivar selection, and fungicide treatment. For table beet and Swiss chard, conspicuous foliar pustules and premature leaf deterioration could also reduce marketability, particularly where leaves are part of the marketed product.

Significant losses have been documented under favorable conditions. Kaczmarek et al. 2019 reported that beet rust can cause sugar beet yield losses of up to 10 percent in the United Kingdom. Kristoffersen et al. 2018 evaluated 15 years of Danish trials and reported yield reductions of up to 11 percent in trials with significant rust infection. Cultivars differed in susceptibility, and fungicide treatments produced positive economic returns when disease pressure was sufficient (Kaczmarek et al., 2019; Kristoffersen et al., 2018).

Worldwide Distribution: Africa: Algeria, Egypt, Ethiopia, *Kenya, Libya, Morocco, South Africa*. Asia: Bangladesh, *India, Iran, Israel, Lebanon, Turkey, Yemen, former USSR*. Europe: Austria, *Belgium, Bulgaria, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Norway, Poland, Portugal (including the Azores and Madeira Islands), Romania, Russia, Spain (including the Balearic and Canary Islands), Sweden, Switzerland, Ukraine, United Kingdom (including Scotland)*. North America: *Canada, Mexico, United States* (Arizona, California, New Mexico, Oregon, South Dakota, Washington). Oceania: *Australia, New Zealand*. South America: *Argentina, Bolivia, Brazil, Chile, Colombia*. (Farr et al., 2026; CABI, 2019).

Official Control: *Uromyces beticola* is on the USDA PCIT's Harmful Organisms list for the Dominican Republic, Ecuador, Honduras, Japan, Nicaragua, and Panama (USDA PCIT, 2026).

California Distribution: Widespread in California. Official records from Santa Barbara and Solano counties. Older records from the north coast, south coast, valley north, and valley south (French, 1989).

California Interceptions: none

The risk that *Uromyces beticola* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** Beets can be grown throughout much of California as commercial crops, seed crops, specialty vegetables, or garden plants. Disease development is favored by cool, moist weather at approximately 15 to 21°C. Coastal districts, cool-season production periods, irrigated fields, and locations with prolonged leaf wetness are likely to be most suitable. Extended hot and dry conditions in many interior areas would be less favorable, although winter or spring production could provide suitable periods.

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

   Score: **2**

- Low (1) Not likely to be established 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 verified host range is largely restricted to cultivated and wild forms of *Beta vulgaris*. These include several economically useful crop forms, but the pathogen does not have a broad host range across multiple plant families or genera.

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:** *Uromyces beticola* produces abundant airborne urediniospores and can complete repeated secondary infection cycles during favorable weather. Natural aerial dispersal can be supplemented by movement of infected plants, leaves, petioles, seed stalks, seeds, or contaminated plant material. Wild sea beet, volunteer beet, and overwintered beet plants can maintain inoculum locally. The combination of repeated spore production, aerial movement, and persistence on living hosts supports a high reproductive and dispersal score.

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 reproductive and dispersal potential.**

4) **Economic Impact:** No documented impact on threatened or endangered California species, natural communities, ecosystem processes, agricultural water systems, or important wildlife resources was located.

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

Economic Impact:

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: 1

- 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:** This pathogen could affect home/urban gardens

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

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: 2
- 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 *Uromyces beticola:* Medium

Add up the total score and include it here. **9**
-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 'high'.

Score: -3
-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 is 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* ***= 6***

Uncertainty:

None

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Uromyces beticola*** **is C.**

References:

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Responsible Party:

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

***Comment Period: 09/10/2026 through 10/25/2026**

***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.

Pest Rating: C
