CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Profile for

Gymnotelium blasdaleanum (Dietel & Holway) Arthur 1934

Pacific Coast pear rust

Pest Rating: C

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

Comment Period: 10/17/2025 through 12/01/2025

Initiating Event:

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

History & Status:

Background:

The rust fungi belong to one of the largest groups of Basidiomycota, in the order Pucciniales. Rust-causing pathogens are biotrophic fungi and obligate parasites of plants; they develop and reproduce without killing their hosts. Macrocyclic rust fungi have life cycles that involve up to five different spore types or stages within the life cycle, although many have fewer. These spore stages are produced sequentially on two separate hosts, and both hosts are necessary to complete the life cycle. There is an alternation of generations between the gametothalli (spermogonia and aecia) and sporothalli (uredinia and telia) that infect unrelated hosts (Aime et al., 2014; Aime and McTaggert, 2021). More than half of the species in Rosaceae are susceptible to rust fungi (Helfer, 2005).

The rust pathogens significant for apple and pear trees are unique fungi that belong to the family Gymnosporangiaceae. *Gymnosporangium* and *Gymnotelium* are unusual in that they form teliospores in the spring and aecia in the summer. This is in contrast to most other rusts found in temperate climates that form teliospores in the fall and aecia in the spring.

Pacific Coast pear rust, also known as incense cedar broom rust, is found frequently in the Pacific Northwest and California on incense cedar (*Calocedrus decurrens*). Alternate hosts are apple, crabapple, hawthorn, mountain ash, pear, quince, and serviceberry (*Amelanchier*).

This pathogen was previously named *Gymnosporangium libocedri*. In 2021, Aime and McTaggert published a new classification for the Pucciniales based on combined evidence from morphology, life cycles, hosts, and phylogenetic data. Several new suborders, families, genera, and combinations were made, and some suborders and families were redefined. The Pacific Coast pear rust pathogen was renamed *Gymnotelium blasdaleanum*. The aecial stage develops on a Rosaceae host (secondary or alternate host) and the telial stage on cedars and junipers (primary or telia host).

Aecial hosts: *Amelanchier alnifolia* (Saskatoon serviceberry), *A. arborea* (downy serviceberry), *A. pallida* (pale serviceberry), *Amelanchier* sp., *Chaenomeles japonica* (flowering quince), *Chaenomeles* sp., *Crataegus douglasii* (black hawthorn), *C. rivularis* (river hawthorn), *Crataegus* sp., *Cydonia oblonga* (quince), *Hedlundia hybrida* (Swedish service-tree), *Juglans californica* (California black walnut), *Malus baccata* (Siberian crabapple), *M. floribunda* (Japanese flowering crabapple), *M. fusca* (Pacific crabapple), *M. ioensis* (prairie crabapple), *M. sylvestris* (European crabapple), *Pyrus communis* (European pear), *Sorbus americana* (American mountain ash), *S. aucuparia* (rowan), *S. hybrida* (oakleaf mountain ash), *S. scopulina* (Greene's mountain ash), *S. sitchensis* (Sitka mountain ash) (Farr and Rossman, 2025).

Telial hosts: *Calocedrus decurrens* (California incense cedar), *Juniperus communis* (common juniper).

Symptoms: Aecial hosts: on apples, the disease most often appears after bud break and flowering in spring through early summer. Initial symptoms on leaves are distinct, round to irregular, yellow to bright orange spots on the upper leaf surface. Corresponding to those upper-surface spots, the lower leaf surface develops swollen, blister-like convex areas that produce cup-shaped pustules (aecia), which are often described as acorn- or cup-shaped and may break open along slits to reveal the aecial mass. The aecia are up to several millimeters high, and when abundant, they can coalesce to cover a significant leaf area. On fruit, the fungus causes yellow-orange spots with numerous small, cup-shaped pustules on the skin surface. Young, infected fruit may become distorted and frequently drop prematurely, reducing their marketable yield. Twig and young shoot infections can occur but are less common. Severe foliage infection can occur when the two hosts are very close together and can cause premature defoliation.

Other aecial rosaceous hosts (quince, hawthorn, serviceberry, mountain ash) may show a similar symptom pattern with circular to irregular yellow to orange spots on leaves, often with tube- or cup-like aecial structures developing on the underside beneath the leaf spots. The aecia later darken or develop into black-centered spots. This may vary with host species and stage of development. On some hosts (for example, quince, hawthorn), the fungus can additionally produce swollen, distorted fruits or spiny-looking deformations; on hawthorn, infected shoots or fruits can become galled and distorted.

Telial host: On incense-cedar, the rust is most conspicuous in spring. Infected branches often produce witches' brooms or dense tufted cluster growths (localized, perennial branch swellings and many short

lateral shoots) that represent chronic infections. On those brooms or on older twigs, the fungus forms small, elongated, or rounded galls in which the telial stage develops. In wet weather in spring, these galls extrude bright orange to orange-brown, gelatinous masses (telial horns or telia) that look like globs of orange jelly on the foliage and small twigs. The telial horns are repeatedly produced over successive wet periods and can persist on the broom for several weeks. When telial horns age and dry, they collapse and are less conspicuous. Aside from the visual nuisance and brooming, infections on large healthy trees are usually not lethal, although severe brooming and deformity can occur on young trees or in areas where they are very close to the alternate hosts and receive large amounts of inoculum (Pscheidt and Bassinette, 2007; Cannon et al., 2016; Sandoval et al., 1979).

Transmission: Telial gelatinous horns growing on the conifer host produce basidiospores that are windborne and infect rosaceous hosts. Aecial hosts produce aeciospores that can complete the cycle by infecting the conifer. The telial structures on the conifer can persist and produce spores in multiple wet seasons; aecial infections on rosaceous hosts are normally annual.

There is no repeating phase of urediniospores in this rust's life cycle. Long-distance spread is with the movement of nursery stock of either host, but they must be planted close to one another for the disease to amplify. The aecial phase is easily seen as bright orange spots on foliage and fruit. The telial horns are ephemeral and can be seen only during rainy weather in the spring, and they are much more difficult to detect, making conifer nursery stock higher risk for accidental movement.

Damage Potential: Aecial hosts: fruit may become malformed, crack, or be aborted and drop early, or be unsalable for fresh markets. Severe infections of leaves can cause premature defoliation, reducing photosynthates, and weakening the tree. Young shoots, petioles, and peduncles may be swollen or distorted; repeated heavy attack can stunt shoot growth and cause localized dieback.

Telial hosts: infected twigs/branches develop woody galls that persist and enlarge over the years. Galls can girdle twigs, cause dieback of small branches, reduce growth, and ornamental/timber value. Mortality of mature trees is uncommon, but it is possible for small or stressed trees.

Worldwide Distribution: Canada, United States (California, Idaho, Oregon, Washington) (French, 1989; Pscheidt and Bassinette, 2007; Duarte et al., 2024).

Official Control*:* All *Gymnosporangium* species not known to be present in the EU are regulated in Council Directive 2000/29/EC (Annex IAI) as harmful organisms whose introduction into the EU is banned (EFSA, 2018).

California Distribution: Alameda, Amador, El Dorado, Los Angeles, Monterey, Placer, Plumas, San Joaquin, San Luis Obispo, San Mateo, Shasta, Siskiyou, Sonoma, and Trinity counties (CDFA PDR Database, 2025).

California Interceptions: There have been interceptions at border stations on nursery stock from Oregon and Nevada.

The risk that *Gymnotelium blasdaleanum* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This pathogen is likely to be found anywhere its hosts can grow.

   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 includes multiple aecial hosts in the family Rosaceae, plus incense cedar and junipers as telial hosts.

   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:** This rust has a complicated life cycle, and the proximity of its two hosts to one another is very important. The spores do not disperse long distances. Artificial spread is with infected nursery stock.

   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:** This disease reduces the productivity of apples, pears, and berries. It is a quarantine pest in some jurisdictions. Hosts should not be planted within 300m of each other in areas where the disease is established.

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

   Economic Impact: A, B, 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:** Incense cedar is a known host and is native to California (Calflora, 2025). The main danger to the telial hosts where this disease occurs is that they will be removed to protect the aecial hosts (fruit trees or berries). Many of the hosts of this rust are native plants.

Evaluate the environmental impact of the pest on 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 *Gymnotelium blasdaleanum:* 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 'high'.

Score:
-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* ***= 9***

Uncertainty:

There are native and nonnative rusts in the family Gymnosporangiaceae. Identification of species can be difficult, and accurate identification is vital for regulatory work, to separate any new invasives.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Gymnotelium blasdaleanum*** **is C.**

References:

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*Comment Period: 10/17/2025 through 12/01/2025

*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