California Pest Rating Profile for

Xanthomonas oryzae pv. *oryzae* (Ishiyama, 1922) Swings et al., 1990

Rice bacterial blight

Pest Rating: A

Kingdom: Bacteria, Phylum: Proteobacteria,
Class: Gammaproteobacteria, Order: Lysobacterales,
Family: Lysobacteraceae

Comment Period: 2/25/2026 through 04/11/2026

Initiating Event:

This pathogen has not been through the pest rating process. It is an important pathogen for export seed certification for rice and is on the USDA's Select Agent list of highly regulated plant pathogens. The risk to California from *Xanthomonas oryzae* pv. *oryzae* is described herein, and a permanent rating is proposed.

History & Status:

Background:

Rice is grown on approximately 500,000 acres in California. Production is concentrated in the Sacramento Valley, where approximately 95% of California rice is grown, with the balance in a few counties of the northern San Joaquin Valley. The total value of rice production in 2023 was just short of $1B (CDFA Ag Statistics). California rice production yields can exceed 10,000 lbs/acre, which is 20% above the U.S. average. Over 90% of the rice acreage in California is planted to medium grain varieties, with limited area planted to short and long grain varieties. California is unique among the U.S. rice-producing states in its geography, climate, and environmental regulations. The growing season is characterized by a Mediterranean climate with negligible rainfall, high solar radiation, and relatively cold night-time temperatures.

Bacterial blight has been found in many rice-producing areas and is particularly destructive in Asia during the heavy rains of the monsoon season. Reductions in yield may be as high as 70%. The disease

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was first described in Japan in the 1920s and has been reclassified numerous times. On the basis of phenotypic, genotypic, and chemotaxonomic data, Swings et al. (1990) reclassified the causal agent of bacterial blight as *X. oryzae* pv. *oryzae* and bacterial leaf streak, a separate disease, as *X.s oryzae* pv. *oryzicola.* A third group of *X. oryzae*, referred to as Xo-USA, is found in Louisiana and Texas, causing very weak disease symptoms that resemble bacterial blight, and is genetically distinct from either pv. *oryzae* or pv. *oryzicola* and currently have no pathovar designation. Because of its economic impact and its role as a well-established model system, *X. oryzae* pv. *oryzae* has been ranked in the top-10 list of bacterial plant pathogens.

Xanthomonas oryzae (all strains and pathovars) are on the USDA Plant Protection and Quarantine (PPQ) Select Agents and Toxins list. Inclusion on this list means a pathogen or toxin has been identified as a severe threat to U.S. agriculture, crops, or forests. These regulated agents require strict compliance, including registration, specialized security, and oversight by APHIS for possession, use, or transfer (https://www.selectagents.gov/sat/list.htm).

If *X. oryzae* pv. *oryzae* was to be detected in California, actions that may be taken include regulatory measures to quarantine infected or potentially infected production areas, stopping the movement of infected or potentially infected articles in commerce, and control measures, which may include host removal and destruction, and/or ensuring adherence to required sanitary practices. APHIS could impose quarantines and regulatory requirements to control and prevent the interstate movement of quarantined or regulated articles, working in conjunction with states to impose these actions parallel to state regulatory actions that restrict intrastate movement (Recovery plan for *Xanthomonas oryzae*, 2013).

Hosts: The major host is *Oryza sativa* (rice). Additional hosts include: *Cenchrus ciliaris* (African foxtail grass), *Cynodon dactylon* (Bermuda grass), *Cyperus difformis* (small-flowered nutsedge), *C. rotundus* (purple nutsedge), *Echinochloa crus-galli* (barnyard grass), *Leersia hexandra* (southern cutgrass), *L. japonica* (Japanese cutgrass), *L. oryzoides* (rice cutgrass), *L. sayanuka* (Sayanuka cutgrass), *Leptochloa chinensis* (Chinese sprangletop), *L. mucronata* (red sprangletop), *Megathyrsus maximus* (Guinea grass), *Oryza australiensis* (Australian wild rice), *O. glaberrima* (African rice), *O. longistaminata* (red rice), *O. rufipogon* (brownbeard rice), *Paspalum distichum* (knotgrass), *P. scrobiculatum* (Kodo millet), *Urochloa mutica* (para grass), *Zizania aquatica* (annual wild rice), *Z. latifolia* (Manchurian wild rice), *Z. palustris* (northern wild rice), and *Zoysia japonica* (zoysiagrass) (EPPO, 2026).

Symptoms: Bacterial blight is a vascular disease resulting in tannish-gray or white lesions along the veins. Bacterial blight usually appears in the field when plants are at the tillering stage. The disease begins as a water-soaked spot near the margins of fully expanded leaves. These lesions can have a wavy margin and rapidly expand the length of the leaf through the vascular tissue of the plant. Older lesions appear as bleached white to straw-colored necrotic areas that may cover most of the leaf area. The symptoms may be difficult to distinguish from physiological problems such as saline toxicity and drought sensitivity. If infected at the seedling stage, a 'kresek symptom' may occur from 1 or 2 weeks after transplanting; in this case, the diseased leaves become greyish-green in color and fold, then roll up along the midrib; the plants die within 2 to 3 weeks. In cases of severe infection, yellow bacterial

exudates are visible in the guttation fluid, which oozes from the leaves' natural openings. These bacterial exudates dry on the underside of the leaf. Exudates may also become a secondary source of inoculum as they are moistened by high local humidity or precipitation (Mew, 1993; Mew et al., 1993).

Transmission: Previously infected rice stubble may also serve as a source of inoculum, and the bacteria can overwinter on alternate hosts (Mew et al., 1987). It has been reported to survive in leaves in the soil for 1 to 3 months, depending on humidity and soil properties. Infected leaf straw may also serve as a source of inoculum. People walking through a field or moving equipment may also move inoculum. While *X. oryzae* pv. *oryzae* has been associated with the rice seed coat, seed-transmission is controversial, and the epidemiological significance of seedborne transmission has not been established. Movement between leaves and plants occurs as the bacteria are blown by strong winds or splashing rains, or as leaves rub against one another. The bacteria may also be present in asymptomatic tissue, passively multiplying for a quorum to initiate the synthesis of virulence factors and start a pathogenic function (Verdier et al., 2012).

Damage Potential: Bacterial leaf blight is the most serious disease of rice in Southeast Asia, particularly since the widespread cultivation of dwarf high-yielding cultivars in the 1960s (Ou, 1985; Mew, 1987). Infection at the seedling stage can lead to total crop losses. More commonly, however, plants are affected at the tillering stage, and yields are reduced by 10-20%. In fields where the crop is severely infected, the disease also causes significant reductions in grain quality, including brittle, broken kernels (Ou, 1985).

Worldwide Distribution: **Africa:** *Benin, Burkina Faso, Burundi, Cameroon, Gabon, Kenya, Madagascar, Mali, Niger, Senegal, Togo, Uganda*. **Americas:** *Bolivia, Costa Rica, Ecuador, El Salvador, Honduras, Mexico, Panama*, *Venezuela*. **Asia:** *Bangladesh, Cambodia, China, India, Indonesia, Iran, Japan, Democratic People's Republic of Korea, Republic of Korea, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand, Vietnam*. **Oceania:** *Australia* (EPPO, 2026).

Official Control*: Xanthomonas oryzae* pv. *oryzae* is on the EPPO's A1 list for Argentina, Azerbaijan, Bahrain, Brazil, Eurasian Economic Union, Egypt, European Plant Protection Organization, European Union, Iran, Kazakhstan, Paraguay, Russian Federation, Serbia, Switzerland, Türkiye, Ukraine, Uruguay, and Uzbekistan; the A2 list for Comité de Sanidad Vegetal del Cono Sur, and Inter-African Phytosanitary Council; and is a quarantine pest in China, Mexico, Morocco, and the United States of America (EPPO, 2026). It is on the USDA PCIT's harmful organisms list for Albania Algeria, Antarctica, Argentina, Azerbaijan, Brazil, China, Colombia, Ecuador, Egypt, Eurasian Customs Union, European Union, Guatemala, Japan, Madagascar, Mexico, Morocco, Namibia, Oman, Panama, Paraguay, Qatar, Serbia, South Africa, Taiwan, The Republic of Türkiye, United Arab Emirates, United Kingdom and Uruguay (USDA PCIT, 2026).

California Distribution: none

California Interceptions: none

The risk that *Xanthomonas oryzae* pv. *oryzae* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Xanthomonas oryzae* pv. *oryzae* thrives in warm, humid, and wet environments, particularly in tropical and sub-tropical regions, though it can also occur in wet temperate climates. Conditions in the Sacramento and San Joaquin valleys are not thought to be conducive to disease development.

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

   Score: **1**
   - 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 small grains and grasses.

   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:** Under favorable conditions, bacterial pathogens that are spread by wind and rain can reproduce exponentially. The disease does not seem to be easily spread by seed, but can be spread by transplants.

   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:** This disease causes large losses to plants directly and through lowering grain quality. It is a significant quarantine pest for the United States.

   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:** This pathogen can overwinter on alternate hosts, including some grasses that are widespread in rice-growing areas. Detections would trigger a regulatory response, including crop destruction. The pathogen, once introduced, could persist on native grasses.

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 *Xanthomonas oryzae* pv. *oryzae:* 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 '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* ***= 12***

Uncertainty:

The main risk of introduction is via imported rice seed used for breeding purposes (germplasm). Milled rice poses a negligible risk because hulls are removed, and endosperm infection is very rare. Importing rice for planting (seed/paddy rice) from Asia into the U.S. is heavily restricted by the USDA to prevent the introduction of foreign diseases. While commercial consumption rice is frequently imported, seeds require strict adherence to APHIS regulations.

Conclusion and Rating Justification:

Based on the evidence provided above, the proposed rating for ***Xanthomonas oryzae*** **pv. *oryzae* is A.**

References:

CABI Compendium. 2026. *Xanthomonas oryzae* pv. *oryzae* (rice leaf blight) https://www.cabidigitallibrary.org/doi/full/10.1079/cabicompendium.56956. Accessed 1/26/2026

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Responsible Party:

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*Comment Period: 2/25/2026 through 04/11/2026

*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: A