cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Ceratocystis platani (Walter) Engelbr. & Harr. 2005 (= *C. fimbriata* f. *platani*) canker stain of plane

Pest Rating: B

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Sordariomycetes,
Subclass: Hypocreomycetidae, Order: Microascales,
Family: Ceratocystidaceae

Comment Period: 06/02/2025 through 07/17/2025

Initiating Event:

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

History & Status:

Background:

Platanus species, especially *Platanus* × *acerifolia* (London plane tree), play a key role in urban areas due to their ecological, social, and aesthetic value. These trees are widely planted along roadsides, in parks, and gardens in the U.S., including California, and also in Europe, as a key member of urban forests. Plane trees are appreciated for their adaptability and resilience in urban environments, including their ability to tolerate air and pollution run-off, poor soil conditions, and drought (Vettraino et al., 2025).

Platanus racemosa (western or California sycamore) is native to California. It can grow up to 100 feet tall and 50 feet wide. It can be recognized by its bark, which is mottled in shades of pale tan, gray, and white, and peels as it ages. It has twisting branches and large leaves that turn orange-yellow in the fall. This tree is a larval food plant for the western tiger swallowtail butterfly. Mature trees require a significant amount of water to thrive, and when not planted near a natural water source such as a river

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or stream, they need regular summer irrigation. They tolerate different soil types and do best in full sun https://calscape.org/Platanus-racemosa-(Western-Sycamore).

Ceratocystis platani is an aggressive pathogen that causes wilt, cankers, and eventually the death of its hosts. It is thought to be native to the southeastern USA, where it has co-evolved with *P. occidentalis*, which is fairly resistant to the disease (Panconesi 1999). Since it was first observed in 1935, it quickly spread through urban plane trees planted in the large cities in the mid-Atlantic states and into the Carolinas and Tennessee (Walter et al., 1952). It was first reported in California in Modesto in 1961 by Perry and McCain (1988) attacking London plane and the California sycamore. There have been multiple introductions into Europe, where it has caused significant mortality of mature London plane trees (Mollet, 2007; Jeger et al., 2016).

Most species of *Ceratocystis* are weakly pathogenic to woody plants. In their native ecosystems, these fungi are primarily wound colonizers and do not cause substantial damage to their hosts. However, after being introduced to new forest ecosystems or to new cultivated hosts, some species have caused substantial tree mortality. People have enhanced epidemics by plant wounding, movement of infected food, and mechanical transmission of the pathogens with contaminated tools (Harrington, 2013).

Ceratocystis has several important tree pathogens. It once included the much larger genus of *Ophiostoma*, which are mostly saprophytic bark and ambrosia beetle associates, but it is now considered a distinct genus. The biology of *Ceratocystis* differs substantially from that of *Ophiostoma*, but the two genera have converged with features of long-necked perithecia (sexual fruiting bodies) with sticky ascospore masses at their tip for insect dispersal. In contrast to *Ophiostoma* and its strong ties to bark beetles, most species of *Ceratocystis* produce fruity volatiles, presumably to attract their vectors, and their relationships with insects are varied (Harrington, 2009).

Phylogenetic analyses indicate that there are at least five species complexes within *Ceratocystis*, with *C. platani* placed in the North American clade of the *C. fimbirata* complex (Harrington, 2009; 2013). All *Ceratocystis* spp. have one or two endoconidial states, in which asexual spores (conidia) are produced within deep-seated, flask-like phialides. The endoconidial anamorph of *C. platani* has not been given a name (Engelbrecht and Harrington, 2005); however, the anamorph of *C. fimbirata*, of which *C. platani* was once treated as a *forma specialis*, was for many years in the genus *Chalara. Charla* was redefined as *Thielaviopsis* by de Beer et al. (2014). In addition, *C. platani* produces resilient, long-lived chlamydospores that can persist in infected wood or soil (Vettraino et al., 2025).

Hosts: Platanus occidentalis (American sycamore), *P. orientalis* (Oriental plane), *P. racemosa* (western or California sycamore), *P.* x *acerifolia* (syn *P.* x *hispanica)* (hybrid or London plane) (Farr and Rossman, 2025).

Symptoms: *Ceratocystis platani* colonizes the sapwood and kills trees within 2-3 years after infection. Early on, small cankers may be visible as dark patches underneath cracks in the bark surface. These small cankers are more conspicuous on the smooth bark of *P. occidentalis* and *P. x acerifolia* than on the rough, thicker bark of *P. orientalis*. Lesions on the trunk are visible throughout the year, while deterioration in the crown is observed exclusively during the growing season. Crown or branch dieback

often precedes tree death. Leaves on affected branches may be poorly developed or show chlorosis or other off-colorations before dying and dropping off. The crown xylem discoloration caused by *C. platani* is not restricted to a particular annual ring. If there is branch dieback, extensive xylem discoloration can generally be found below the dying branch, on the main stem, or most often at the base of the tree if the tree was infected through the root system (Tsopelas et al., 2017; Vettraino et al., 2025). The discoloration is a combination of the host's response to infection and the pigmented hyphae and spores of the pathogen. Microscopic examination will show dark brown aleurioconidia in the stained sapwood (Panconesi et al., 2003). Other fungi can induce xylem discoloration, especially in stressed hosts, but *Ceratocystis* spp. tend to stain the ray parenchyma more intensely than other fungal species.

Transmission: Infected planting stocks (especially rooted cuttings or grafted scions) are the most likely pathway of introduction to new areas. Once introduced, there is potential to spread by multiple natural and human-assisted means, including movement of infected wood, through waterways, root anastomosis, contaminated pruning tools and equipment, insects, contaminated insect frass, and sawdust. In addition, *C. platani* produces resilient, long-lived chlamydospores that can persist in infected wood or soil (CABI, 2025; Jeger et al, 2016). *Ceratocystis platani* infects trees through wounds or other injuries made in the branches, the trunk, or the roots by biotic or abiotic agents. All spore types of the fungus can produce infections when they come into contact with freshly wounded tissue (Vigouroux and Stojadinovic, 1990).

Damage Potential: London planes are highly susceptible to this disease. In 1952, Walter et al. described that all infected trees died quickly in the Philadelphia area, and recovery was never observed. Similar reports in Europe have been made where this pathogen has killed trees of all sizes and ages, some of them of a massive size and centuries old (Ocasio-Morales et al., 2007). In Modesto, canker stain was detected in 1961 from 35-to 45-year-old London plane trees growing as city street plantings. By 1988, the disease had spread to 28 areas in parks and along streets and destroyed some 600 mature trees of multiple species of *Platanus* (Perry and McCain, 1988). There have been no reports of the disease since or elsewhere in California (S. Frankel, USDA Forest Service, M. Garbellotto, UCCE, C. Lee and K. Corella, CALFIRE, pers. comm.). In Europe, the disease has caused devastating levels of tree mortality and is continuing to move into new areas (Tsopelas et al., 2017).

Worldwide Distribution: America: *United States* (Alabama, Arkansas, California, Delaware, District of Columbia, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, Nevada, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, Washington and West Virginia). Europe: *Albania, Armenia, France, Greece, Italy, Switzerland,* and *Turkey* (EPPO, 2025)

Official Control: *Ceratocystis platani* is on the EPPO's A1 list for Bahrain, Iran, Serbia, Turkey, and the United Kingdom. It is on the A2 list for Switzerland, the European Plant Protection Organization, and the European Union. It is a quarantine pest in Morocco and Tunisia (EPPO, 2025). It is on the USDA PCIT's harmful organisms list for Albania, Antarctica, European Union, Holy See (Vatican City State),

Israel, Monaco, Morocco, Oman, Qatar, San Marino, Namibia, the Republic of North Macedonia, Serbia, South Africa, the Republic of Türkiye, the United Arab Emirates, and the United Kingdom (USDA-PCIT, 2025).

California Distribution: CDFA does not have any recent records of this pathogen, but it is listed in French (1989). University of California Cooperative Extension and Arborist trade publications suggest a statewide distribution, but there is a lack of confirmed cases to support this (https://ipm.ucanr.edu/PMG/GARDEN/PLANTS/DISEASES/cankerstain.html).

California Interceptions: none

The risk that *Ceratocystis platani* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This disease has been found in a variety of climates in North America and in Europe (Jeger et al., 2016). It is likely to be found wherever its hosts can grow.

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

   Score: **3**
   - 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 the genus *Platanus.*

   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:** This pathogen produces multiple types of spores that are spread in a variety of ways.

   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 is a serious pathogen of plane trees in some places. With an initial epidemic in Modesto over 50 years ago, where it was suppressed but not eradicated, it is surprising that it has not had more of an impact statewide. It is a quarantine pest for the EU. Contaiminated pruning tools have been implicated in disease spread.

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

   Economic Impact: A, 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:** Our native sycamores are proven hosts, and if they are lost, it would have a significant environmental impact. In Modesto, urban tree plantings were badly damaged by this disease.

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

   Environmental Impact: A, B, C, 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 *Ceratocystis platani:* High

Add up the total score and include it here. **13**

-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 'low'.

Score: -1
-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 consequence 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 current distribution of this disease in California is unknown.

Conclusion and Rating Justification:

Based on the evidence provided above the proposed rating for ***Ceratocystis platani*** **is B.**

References:

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*Comment Period: 06/02/2025 through 07/17/2025

*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: B