California Pest Rating Profile for

Oenothera sinuosa W.L. Wagner & Hoch, wavyleaf gaura, wavyleaf beeblossom

Family: Onagraceae

Pest Rating: B

Synonyms: *Gaura sinuata* Nutt. ex Ser.

Comment Period: 07/28/2022 through 09/11/2022

Initiating Event:
Oenothera sinuosa, formerly known as *Gaura sinuata*, has been previously assigned a B-rating by the California Department of Food and Agriculture (CDFA), Plant Health and Pest Prevention Services, but has not gone through the current pest risk analysis procedure. *Oenothera sinuosa* is designated as a noxious weed as defined by the California Food and Agricultural Code (FAC) Section 5004 and is listed in Title 3, California Code of Regulations (CCR), Section 4500.

History & Status:

Background

Oenothera sinuosa is a perennial herb that grows from basal stems. It has a taproot and lateral rhizomes and creates extensive, clonal mats. Several well-branched stems grow from each base and are 20 to 60 centimeters long and covered in hairs. The leaves are 1 to 10 centimeters long, wavy, and are generally toothed along the edges. The inflorescence is a spicate raceme with whitish to pink flowers with four spoon-shaped petals up to 1.5 cm in length. The petals darken as they age, often to a deep red. The erect indehiscent fruit is linear and narrowly winged, up to 1.5 cm long, and has a stalk-like base. The seeds are 1 to 4 per fruit and 2-3 millimeters in length (Wagner, 2017).

Worldwide Distribution

Oenothera sinuosa is native to eastern Mexico, Oklahoma, Texas, and possibly Alaska (USDA GRIN, 2022). It has been widely naturalized in the southeastern United States, and is reported from the states of Alabama, Arkansas, California, Colorado, Florida, Georgia, Missouri, and South Carolina (USDA PLANTS database, 2022; Wagner and Hoch, 2007). It has also been reported as introduced in Italy and South Africa (IPNI, 2021).

Official Control: *Oenothera sinuosa* is listed in CCR Section 4500 as a noxious weed defined by California FAC Section 5004. The Department is mandated by California FAC, Division 1, Chapter 3, Section 403 to prevent the introduction and spread of noxious weeds.

Oenothera sinuosa (*Gaura sinuata*) is a restricted noxious weed seed subject to stringent tolerances in agricultural seed offered for sale in California (CCR Section 3855). It is also listed in the CDFA Plant Quarantine Manual (2022) as a "restricted noxious weed seed pest liable to be disseminated through the movement of feed grain." All *Gaura* species (now generally included in the genus *Oenothera*) are listed as prohibited noxious weed seeds by the state of Hawaii (USDA AMS, 2022).

California Distribution: *Oenothera sinuosa* has been collected from the counties around the San Francisco Bay area and the coastal or near coastal counties of southern California from Santa Barbara to the southern border of the state. It also has been collected in Sacramento and Fresno counties in the Central Valley (Calflora, 2022; Wagner, 2017).

California Interceptions: There are no reported interceptions of *Oenothera sinuosa* in shipments entering or transported within California in the last 20 years (CDFA/PDR Database, 2022), though the species is listed as a seed pest liable to be disseminated through the movement of feed grain in the CDFA Plant Quarantine Manual.

Consequences of Introduction

1) **Climate/Host Interaction:** Score is **High (3)**

   Oenothera sinuosa is described as low-water tolerant and occurring at elevations of less than 280 meters (CalFlora, 2022). It is described in its native habitat as occurring in flats, washes, prairies, and cleared timberlands (Raven and Gregory, 1972). Wagner (2017) states that the species was probably originally native to the prairies and rolling plains of Oklahoma and Texas and that it has spread rather widely as a weed of cultivated areas in rich, light soils, often forming patches of considerable size.

   -Low (1) Not likely to establish 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:** Score is **High (3)**
   Oenothera sinuosa can occur wherever general ecological conditions exist that are conducive to its survival.
   - Low (1) has a very limited host range
   - Medium (2) has a moderate host range
   - High (3) has a wide host range

3) **Pest Dispersal Potential:** Score is **Medium (2)**

Oenothera sinuosa is described as an "aggressively rhizomatous perennial herb" that forms extensive mats with well branched stems (Raven and Gregory, 1972). Wagner *et al* (2007) state that *Oenothera sinuosa* is a noxious weed, but that its seed set is limited by its self-incompatibility. The species is primarily dispersed as a fruit or seed and has been noted as a species likely to be spread as a seed contaminant in feed grain (CDFA Plant Quarantine Manual).

- 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: Score is **Medium (2)**

Due to the existing noxious weed and restricted weed seed status of *Gaura sinuata (Oenothera sinuosa)*, infested nursery stock or other agricultural shipments are subject to loss of marketability or quarantine. Because of the aggressively rhizomatous habit of the plant it is likely to lower crop yield in agricultural fields.

A. The pest could lower crop yield.
B. The pest could lower crop value (includes increasing crop production costs).
C. The pest could trigger the loss of markets (includes 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:
- 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: Score is **Medium (2)**

The environmental impact of *Oenothera sinuosa* is medium due to the potential displacement of native species as a result of the extensive, rhizomatous mats.

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:
- 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 *Oenothera sinuosa*: **Medium (12)**

Low = 5-8 points
Medium = 9-12 points
High = 13-15 points

1) **Post Entry Distribution and Survey Information**: Score is **Medium (2)**
The CalFlora Databases contains 116 records of *Oenothera sinuosa* (*Gaura sinuata*) occurrences in California starting in 1921, with occurrences per county as follows: Santa Barbara (38); San Diego (21); Los Angeles (13); Ventura (14); Riverside (6); Sacramento (4); San Bernardino (4), San Mateo (4); Fresno (3); Napa (3); Orange (3); and Alameda (1); (CalFlora, 2022)

-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) **Final Score: Medium 10 (12-2=10)**

Conclusion and Rating Justification:
Due to the aggressively rhizomatous habit of the plant and current presence of *Oenothera sinuosa* in agricultural lands in California, and the Medium rating of this analysis, a B-rating is recommended.

Uncertainty: The species has been known in agricultural areas of California since the 1920's and thus there is little uncertainty in the risks that it poses to agriculture and the environment of the state.

References

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Wagner, W.L. 2017, *Oenothera sinuosa*, in Jepson Flora Project (eds.) Jepson eFlora, Revision 5, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=89230o Accessed February 16, 2021

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***Comment Period: 07/28/2022 through 09/11/2022**

***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