

California Pest Rating Proposal for

Solanum lanceolatum Cav., lance-leaf nightshade

Family: Solanaceae

Pest Rating: B



Photo credit: Joseph DiTomaso, Univ. of California Davis, Bugwood.org

Comment Period: 02/14/2023 through 03/31/2023

Initiating Event:

Solanum lanceolatum has been assigned a B-rating by the California Department of Food and Agriculture (CDFA), Plant Health and Pest Prevention Services. *Solanum lanceolatum* 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. A pest rating proposal is required to evaluate its current rating and status in the state of California.

History & Status**General Description**

Solanum lanceolatum is a shrub to small tree, from 0.8-5 meters in height, with stems stellate-hairy and sparsely prickly (Nee, 2012; Solanaceae Source, 2022). In its native range, *Solanum lanceolatum* may also occur as a woody climber (CRBio, 2022). Stems are pubescent with stellate and sometimes glandular hairs. The leaves are alternately arranged and dark green and variable in shape (can be deeply divided or elliptic to ovate), with dense, white stellate hairs on the lower leaf surface. Leaves and stems may also be armed with sharp brownish prickles. The flowers of *Solanum lanceolatum* are arranged in dense, terminal clusters on short pedicels. The flowers are approximately 2.5-4 cm in diameter, five-parted and radial, and have bluish-purple, deeply lobed petals and conspicuous, yellow anthers. The fruit is a multi-seeded round, pendant berry, 0.8 to 1.5 cm in diameter, stellate-hairy when young and yellow to yellowish-orange and shiny when mature. The yellowish to light brown seeds are 2-3 mm long, flattened and reniform in shape (Solanaceae Source, 2022).

Worldwide Distribution

Solanum lanceolatum is native to Mexico and Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panamá) (POWO, 2022; Solanaceae Source, 2022). The species has been found and is considered naturalized on the island of Sicily in the Mediterranean Sea (Cambria et al., 2015) as well as in California (POWO, 2022; USDA GRIN, 2022).

Official Control:

Solanum lanceolatum is listed on 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. *Solanum lanceolatum* is listed as a restricted noxious weed seed in California defined by California FAC Section 52258 and subject to stringent tolerances in agricultural seed shipments into and within California.

California Distribution:

Solanum lanceolatum has been reported from vouchered collections from at least 13 counties in California (CCH, 2022), including Alameda, Contra Costa, Monterey, Santa Clara, and Solano counties in the San Francisco Bay region, and Los Angeles, Monterey, Orange, Riverside, San Luis Obispo, Santa Barbara, San Bernardino, San Diego, and Ventura counties in central and southern California, and has been most frequently been collected in coastal or near coastal counties of southern California (Calflora database, 2022). Reports from Humboldt County in far northern California appear to represent a different species with more elongated fruits (*Solanum laciniatum*).

California Interceptions:

The CDFA Pest and Damage Record Database does not contain any records of border interceptions of *Solanum lanceolatum*.

Consequences of Introduction

1) **Climate/Host Interaction:** Score is **Medium (2)**

Solanum lanceolatum occurs in disturbed areas in California, most commonly in at less than 200 meters above sea level (Nee, 2012). It is low-water tolerant and able to withstand freezing winter temperatures to at least a limited degree (CalFlora Database, 2022). The location descriptions for the California collections include roadsides, vacant lots, parking lots, creek beds, beaches, residential and botanical gardens, parks, railroad rights-of-way (CalFlora Database, 2022).

In its native range in Mexico and Central America, *Solanum lanceolatum* occupies areas of secondary vegetation and disturbed areas in moist or wet forest, frequently in oak-pine forest at elevations of up to 3,000 m above sea level, and sometimes occurs on arid plateau regions in south-central Mexico (CRBio, 2022; Solanaceae Source, 2022).

- 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)**

Solanum lanceolatum 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 **High (2)**

Solanum lanceolatum plants can produce dozens of many-seeded fleshy berry fruits, which are likely to be dispersed by birds or other animals (CRBio, 2022; Solanaceae Source, 2022). At one location in Sicily where *Solanum lanceolatum* plants have escaped cultivation and are spreading, the plants do not produce fruit and appear to be spreading only via vegetative reproduction, but another population in Sicily is successfully reproducing by seed (Cambria et al, 2015). The plant can resprout from the base when damaged (Solanaceae Source, 2022).

- 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 **High (3)**

Solanum plants in general can contain various glycoalkaloids, making them unpalatable to livestock, though the chemistry of this species does not appear to be well documented. Plants may be consumed by livestock if appropriate forage is unavailable, or if contaminated hay and grain are used for livestock feed. The toxic effects of *Solanum* plants on livestock can be acute or chronic,

and can include labored breathing, increased heart rate, apathy, drowsiness, weakness, paralysis, gastrointestinal irritation, emaciation, constipation, ascites, and death (USDA/ARS, 2011).

In 2019, cattle, calves, sheep, and lamb production in California was valued at approximately \$3.6 million dollars. The top five cattle and calf producing counties in California in 2019 were Tulare, Imperial, Fresno, Merced, and Kern. The top five sheep producing counties in California in 2019 were Fresno, Kern, Sonoma, Solano, and Merced (CDFA, Agricultural Statistics Review, 2020).

Shipments, including agricultural seed, that are found infested with *Solanum lanceolatum* are subject to rejection, treatment, reconditioning, or destruction, typically at the owner's expense.

- 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)**

- 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 *Solanum lanceolatum* **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)**

- 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 (12-2=10)

Conclusion and Rating Justification:

Due to the economic impacts of *Solanum lanceolatum* on California's agricultural industry, including the rejection of infested agricultural seed shipments and potential toxicity to livestock, a B-rating is recommended.

Uncertainty:

Solanum lanceolatum is not currently found in agricultural settings in California, but as a large and vigorous plant subject to stump sprouting would necessitate control if it does spread into rangeland or farmland settings.

References

Atlas of Living Costa Rica-CRBio 2022. <http://www.crbio.cr:8080/neoportal-web/species/Solanum%20lanceolatum> Accessed July 12, 2022

Calflora: Information on California plants for education, research, and conservation, with data contributed by and private institutions and individuals, including the Consortium of California Herbaria. 2022. Berkeley, California <https://www.calflora.org> Accessed December 16, 2022

California Department of Food and Agriculture, California Agricultural Statistics Review (Crop Report), 2019-2020. https://www.cdfa.ca.gov/Statistics/PDFs/2020_Ag_Stats_Review.pdf Accessed July 12, 2022

California Department of Food and Agriculture (CDFA), Plant Pest Diagnostics Branch, Pest and Damage Record (PDR) Database. Accessed December 16, 2022.

Consortium of California Herbaria (CCH). 2022. Data provided by the participants of CCH. Regents of the University of California. <http://ucjeps.berkeley.edu/consortium/> Accessed December 16, 2022.

Cambria, S., Banfi, E., Verloove, F. and Domina, G., 2015. *Solanum lanceolatum* (Solanaceae) in Sicily: a new alien species for the European flora. *Flora Mediterranea*, 25, pp.115-120. https://iris.unipa.it/retrieve/handle/10447/174422/289991/Cambria&al_Solanumlanceolatum_2015.pdf Accessed July 29, 2022

Nee, M. 2012, *Solanum lanceolatum*, in Jepson Flora Project (eds.) Jepson eFlora, <https://ucjeps.berkeley.edu> Accessed July 12, 2022

Plants of the World Online (POWO) 2022. Facilitated by the Royal Botanic Gardens, Kew. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:819734-1#publications> and <http://apps.kew.org/herbcat/getImage.do?imageBarcode=K001169122> Accessed December 16, 2022

Solanaceae Source: a global taxonomic resource for the nightshade family. 2022. *Solanum lanceolatum* Cav. [Solanium lanceolatum \[Cav. \] \(myspecies.info\)](https://myspecies.info) Accessed October 20, 2022

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), PLANTS Database, National Plant Data Team, Greensboro, NC 27401-4901 USA. <https://plants.sc.egov.usda.gov/home/plantProfile?symbol=SOLA> Accessed July 16, 2022

United States Department of Agriculture (USDA), Agricultural Research Service (ARS), Agriculture Information Bulletin Number 415, "Plants Poisonous to Livestock in the Western States", Revised April 2011. Poisonous Plant Research Laboratory, Logan, Utah. Hard copy on file.

United States Department of Agriculture (USDA), Agricultural Research Service, National Plant Germplasm System. 2022. Germplasm Resources Information Network (GRIN Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. [Solanium lanceolatum Cav. GRIN-Global \(ars-grin.gov\)](https://ars-grin.gov) Accessed December 16, 2022.

Author Contact: Courtney.Albrecht@cdfa.ca.gov

Responsible Party: Robert Price, Primary State Botanist; California Department of Food and Agriculture; Seed Laboratory and Herbarium; 3294 Meadowview Road, Sacramento, CA 95832; (916) 738-6700; permits@cdfa.ca.gov.

***Comment Period: 02/14/2023 through 03/31/2023**

***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](mailto: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
