



***Plant Risk Evaluator -- PRE™
Evaluation Report***

Allium sativum -- Texas

2017 Farm Bill PRE Project

PRE Score: 7 -- Accept (low risk of invasiveness)

Confidence: 81 / 100

Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public

Status: Completed

Evaluation Date: August 28, 2017

This PDF was created on July 06, 2018



Plant Evaluated

Allium sativum



Image by H. Zell



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Allium sativum*) in an effort to understand the invasive history, reproductive strategies, and the impact, if any, on the region's native plants and animals. This research reflects the data available at the time this evaluation was conducted.

General Information

Status: Completed

Screener: Kim Taylor

Evaluation Date: August 28, 2017

Plant Information

Plant: *Allium sativum*

If the plant is a cultivar, how does its behavior differs from its parent's?

The plant is not a cultivar.

Regional Information

Region Name: Texas

Climate Matching Map

To answer four of the PRE questions for a regional evaluation, a climate map with three climate data layers (Precipitation, UN EcoZones, and Plant Hardiness) is needed. These maps were built using a toolkit created in collaboration with GreenInfo Network, USDA, PlantRight, California-Invasive Plant Council, and The Information Center for the Environment at UC Davis.

Click [here](#) to see the generated climate matching map for this region. This climate match database is hosted by GreenInfo Network and publicly accessible.



Evaluation Questions

These questions are based in an original article published at the University of California, Davis, and can be found on the PLOS One website, here: <https://doi.org/10.1371/journal.pone.0121053>

Invasive History and Climate Matching (Questions 1 - 6)

1. Has the species (or cultivar or variety, if applicable; applies to subsequent "species" questions) become naturalized where it is not native?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

There are records of the species growing wild across much of the midwestern US as well as parts of the Northeast and California. It is also naturalized across most of Europe and North Africa.

Reference(s):

- GBIF (0). *Allium sativum* L. - GBIF.
 - Plants of the World Online (0). *Allium sativum* L. - Plants of the World Online.
 - Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
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2. Is the species (or cultivar or variety) noted as being naturalized in the US or world in a similar climate?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

There are records of the species in areas with matching habitat including portions of Texas. The species also occurs in portions of Western Europe and China which have a similar climate.



Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
 - Plants of the World Online (0). *Allium sativum* L. - Plants of the World Online.
-

3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The species is not considered invasive anywhere in the US and there is no evidence of it being invasive outside the US.

Reference(s):

- Invasive Plant Atlas of the United States (0). Herbs/Forbs: Invasive Plant Atlas of the United States.
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4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

This species is not considered invasive.

Reference(s):

- [Anonymous] .
-



5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Allium vineale ssp. *vineale* is listed as invading Southeastern US forests. It is also listed as invasive in Texas. *Allium ursinum*, *A. oleraceum*, *A. canadense*, and *A. tuberosum* are considered invasive or weedy in parts of the US or Europe.

Reference(s):

- Encyclopedia of Life (0). Garlic - *Allium sativum* - Overview.
 - Invasive Plant Atlas of the United States (0). Herbs/Forbs: Invasive Plant Atlas of the United States.
 - TexasInvasives.org (0). Texas Invasives *Allium vineale*.
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6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Reference(s):

- GBIF (0). *Allium sativum* L. - GBIF.
 - Plants of the World Online (0). *Allium sativum* L. - Plants of the World Online.
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Impact on Native Plants and Animals (Questions 7 - 10)

7. Does this plant displace native plants and dominate (overtop or smother) the plant community in areas where it has established?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Adekpe et al. note the species is a poor competitor with crop weeds "due to its slow growth, small stature, shallow roots and thin canopy that does not shade the soil enough to suppress weeds."

Reference(s):

- Adekpe, D.I., Shebayan J.A.Y., Chiezey U.F., Miko S., & Tunku P.. (2007). Effects of weed control, date of planting and intra-row spacing on weeds and bulb yield of garlic (*Allium sativum* L.) at Kadawa, Nigeria. *Advances in Horticultural Science*. 21, 165–171.
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8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of this.

Reference(s):

- [Anonymous] .
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9. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The species is noted as being poisonous to mammals.

Reference(s):

- U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.8.2.
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10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

This species is herbaceous and does not produce thickets.

Reference(s):

- efloras.org (0). *Allium sativum* var. *sativum* in Flora of North America @ efloras.org.
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Reproductive Strategies (Questions 11 - 17)

11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **Very High** confidence in this answer based on the available literature.



Answer / Justification:

This species reproduces primarily via bulbels.

Reference(s):

- efloras.org (0). *Allium sativum* var. *sativum* in Flora of North America @ efloras.org.
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12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

When cloves are detached they will grow to a new plant.

Reference(s):

- efloras.org (0). *Allium sativum* var. *sativum* in Flora of North America @ efloras.org.
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13. Does the species (or cultivar or variety) commonly produce viable seed?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Allium sativum is typically sterile and propagated only from cloves. Seeds that are produced tend to die quickly.



Reference(s):

- Shemesh, E., Scholten O., Rabinowitch H. D., & Kamenetsky R. (2008). Unlocking variability: inherent variation and developmental traits of garlic plants originated from sexual reproduction. *Planta*. 227, 1013–1024.
 - efloras.org (0). *Allium sativum* var. *sativum* in Flora of North America @ efloras.org.
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14. Does this plant produce copious viable seeds each year (> 1000)?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Allium sativum does not typically produce seeds.

Reference(s):

- Shemesh, E., Scholten O., Rabinowitch H. D., & Kamenetsky R. (2008). Unlocking variability: inherent variation and developmental traits of garlic plants originated from sexual reproduction. *Planta*. 227, 1013–1024.
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15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Allium sativum does not usually produce seeds.



Reference(s):

- Shemesh, E., Scholten O., Rabinowitch H. D., & Kamenetsky R. (2008). Unlocking variability: inherent variation and developmental traits of garlic plants originated from sexual reproduction. *Planta*. 227, 1013–1024.
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16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Allium sativum does not usually produce seed but when it does, it occurs beginning in the second year. Since it does not normally produce seeds a no response has been marked.

Reference(s):

- Shemesh, E., Scholten O., Rabinowitch H. D., & Kamenetsky R. (2008). Unlocking variability: inherent variation and developmental traits of garlic plants originated from sexual reproduction. *Planta*. 227, 1013–1024.
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17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Allium sativum is usually sterile and does not produce seeds.



Reference(s):

- Shemesh, E., Scholten O., Rabinowitch H. D., & Kamenetsky R. (2008). Unlocking variability: inherent variation and developmental traits of garlic plants originated from sexual reproduction. *Planta*. 227, 1013–1024.
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Dispersal (Questions 18 - 20)

18. Are the plant's propagules frequently dispersed long distance (>100 m) by mammals or birds or via domestic animals?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Allium sativum is typically sterile and only reproduces vegetatively. There is no evidence that animals spread the species long distances.

Reference(s):

- Shemesh, E., Scholten O., Rabinowitch H. D., & Kamenetsky R. (2008). Unlocking variability: inherent variation and developmental traits of garlic plants originated from sexual reproduction. *Planta*. 227, 1013–1024.
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19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.



Answer / Justification:

Allium sativum is typically sterile and only reproduces vegetatively. There is no evidence that bulbels are dispersed long distances by wind or water.

Reference(s):

- Shemesh, E., Scholten O., Rabinowitch H. D., & Kamenetsky R. (2008). Unlocking variability: inherent variation and developmental traits of garlic plants originated from sexual reproduction. *Planta*. 227, 1013–1024.
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20. Are the plant's propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of this.

Reference(s):

- [Anonymous] .
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Total PRE Score

PRE Score: 7 -- Accept (low risk of invasiveness)

Confidence: 81 / 100

Questions answered: 20 of 20 -- Valid (80% or more questions answered)



PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.

< 13 : accept (low risk of invasiveness)

13 - 15 : evaluate further

> 15 : reject (high risk of invasiveness)

Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".

>= 16 : valid (80% or more questions answered)

<= 15 : invalid (not enough questions answered)

Organization Ownership and Content Privacy

Organization: 2017 Farm Bill PRE Project

Content Privacy: Public



Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

- Charlotte Reemts November 13, 2017
- Steve Moore August 30, 2017

This evaluation has a total of 2 reviewer(s).



Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email PlantRight@suscon.org if additional action is required to resolve open issues.

There are currently no issues associated with this evaluation.



About PRE and this Plant Evaluation Report

The PlantRight Plant Risk Evaluator -- PRE is an online database and platform enabling those involved in non-native, terrestrial plant production to know before they grow if a plant poses a regional invasive risk. This tool offers many benefits, and we encourage you to visit the PRE website (<https://pre.ice.ucdavis.edu>) for more information.

If you are a nursery trade association, or involved in the research, development or distribution of horticultural plants we invite you to join the PRE community. If you are a plant scientist, affiliated with a horticultural college or botanic garden, and would like to learn more about becoming a PRE Screener, please drop us an email, PlantRight@suscon.org, requesting a PRE Account.

PRE beta funding is provided by Sustainable Conservation (<http://www.suscon.org/>) and a USDA Farm Bill grant.