



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

Wisteria sinensis -- Texas

2017 Farm Bill PRE Project

PRE Score: 21 -- Reject (high risk of invasiveness)

Confidence: 78 / 100

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

Privacy: Public

Status: Completed

Evaluation Date: October 1, 2017

This PDF was created on July 06, 2018



Plant Evaluated

Wisteria sinensis



Image by RedCoat, Wikipedia user



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Wisteria sinensis*) 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.

Summary

Wisteria sinensis is an aggressive vine which strangles and smothers native vegetation, often taking down trees. The species is naturalized across much of the eastern U.S. and invasive in portions of the South. The species is widely planted and many cultivars are available. Hybridization may be very important in invasion of this species, and this topic has only just begun to be researched.

General Information

Status: Completed

Screener: Kim Taylor

Evaluation Date: October 1, 2017

Plant Information

Plant: *Wisteria sinensis*

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

This evaluation is for the species, not a particular 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:

Kartesz indicates *Wisteria sinensis* is naturalized across most of the Eastern U.S., west to Texas. USDA Plants indicates it is also naturalized in Hawaii.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
 - USDA, & NRCS (2017). The Plants Database.
-

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:

Kartesz indicates *Wisteria sinensis* is naturalized across most of the Eastern U.S., west to Texas.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).



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

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

Answer / Justification:

The Global Compendium of Weeds identifies the species as "casual alien, environmental weed, naturalised, weed". USDA Plants indicates the species is listed invasive by the Florida Exotic Pest Plant Council and the Southeast Exotic Pest Plant Council. The species is listed by TexasInvasives.org. The Florida Exotic Pest Plant Council identifies the species as a "Category II" species. EDD Maps indicates the species is invasive in Illinois, Tennessee, South Carolina, Georgia, Alabama, and Florida.

Reference(s):

- FLEPPC (2017). List of Invasive Plant Species.
- Invasive Plant Atlas of the United States (0). Chinese wisteria: *Wisteria sinensis* (Fabales: Fabaceae (Leguminosae)): Invasive Plant Atlas of the United States.
- Invasive Plant Atlas of the United States (0). Japanese wisteria: *Wisteria floribunda* (Fabales: Fabaceae (Leguminosae)): Invasive Plant Atlas of the United States.
- Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
- USDA, & NRCS (2017). The Plants Database.
- Global Compendium of Weeds (GCW) (0). *Wisteria sinensis* information from the Global Compendium of Weeds (GCW).

4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: **Yes**, which contributes **3** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.



Answer / Justification:

The Global Compendium of Weeds identifies the species as "casual alien, environmental weed, naturalised, weed". USDA Plants indicates the species is listed invasive by the Florida Exotic Pest Plant Council and the Southeast Exotic Pest Plant Council. The species is listed by TexasInvasives.org. The Florida Exotic Pest Plant Council identifies the species as a "Category II" species. EDD Maps indicates the species is invasive in Illinois, Tennessee, South Carolina, Georgia, Alabama, and Florida.

Reference(s):

- FLEPPC (2017). List of Invasive Plant Species.
 - Invasive Plant Atlas of the United States (0). Chinese wisteria: *Wisteria sinensis* (Fabales: Fabaceae (Leguminosae)): Invasive Plant Atlas of the United States.
 - Invasive Plant Atlas of the United States (0). Japanese wisteria: *Wisteria floribunda* (Fabales: Fabaceae (Leguminosae)): Invasive Plant Atlas of the United States.
 - Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
 - USDA, & NRCS (2017). The Plants Database.
 - Global Compendium of Weeds (GCW) (0). *Wisteria sinensis* information from the Global Compendium of Weeds (GCW).
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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 *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Wisteria floribunda, *W. xformosa* are naturalized in the Southeastern U.S. and is considered invasive in Illinois, Tennessee, Georgia, and South Carolina. Six species of *Wisteria* are listed in the Global Compendium of Weeds.

Reference(s):

- Global Compendium of Weeds (0). Global Compendium of Weeds: species index.
 - Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
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6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

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

Answer / Justification:

Over half of the species distribution shares a similar climate to Texas, including the eastern US and China.

Reference(s):

- GBIF (0). *Wisteria sinensis* (Sims) Sweet (GBIF).
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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: **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:

"Exotic wisterias impair and overtake native shrubs and trees through strangling or shading. Climbing wisteria vines can kill sizable trees, opening the forest canopy and increasing sunlight to the forest floor, which in turn favors its aggressive growth. Chinese and Japanese wisterias are hardy and aggressive, capable of forming thickets so dense that little else grows." "Can be invasive (rampant growth plus rooting surface runners)." " It climbs by twining around its support which it can kill it by girdling it or overgrowing it. *W. sinensis* vines can also grow over the ground reducing light availability to plants on the ground." "Wisteria sinensis can displace native vegetation and kill trees and shrubs by girdling them. The vine has the ability to change the structure of a forest by killing trees and altering the light availability to the forest floor."



Reference(s):

- Invasive Plant Atlas of the United States (0). Chinese wisteria: *Wisteria sinensis* (Fabales: Fabaceae (Leguminosae)): Invasive Plant Atlas of the United States.
 - Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
 - CABI (0). *Wisteria sinensis* (Chinese wisteria) - CABI.
 - Missouri Botanical Garden (0). *Wisteria sinensis* - Plant Finder.
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8. Is the plant noted as promoting fire and/or changing fire regimes?

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

Answer / Justification:

"As of 2009, no studies specifically addressed fuel characteristics of wisterias. One review suggests that Chinese wisteria, along with a number of other invasive vines, has the potential to alter the fuel characteristics of invaded communities. Specifically, invasive vines could increase fuel loading and continuity, and contribute to the likelihood of crown fire by acting as a ladder fuel. The density, spatial extent, and climbing nature of wisteria populations suggest that they may alter fuel characteristics in invaded communities."

Reference(s):

- Stone, K. R. (2009). *Wisteria floribunda*, *W. sinensis*. In: Fire Effects Information System.
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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 *screeener* has a **High** confidence in this answer based on the available literature.



Answer / Justification:

GRIN indicates the species is economically important as a mammal poison. All parts of the plant are poisonous to humans with the poison wistarine. "The seed of all members of this genus is poisonous. The bark contains a glycoside and a resin that are both poisonous. The seed and seedpod contains a resin and a glycoside called wisterin. They have caused poisoning in children of many countries, producing mild to severe gastro-enteritis." "W. sinensis plant parts are poisonous. Seeds contain lectins. Hairs on the leaves may cause skin irritations"

Reference(s):

- Cornell University Department of Animal Science (0). Plants Poisonous to Livestock - Animal Science - Cornell University.
 - U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.8.2 *Wisteria sinensis*.
 - CABI (0). *Wisteria sinensis* (Chinese wisteria) - CABI.
 - Plants For A Future (PFAF) (0). *Wisteria sinensis* Chinese *Wisteria* PFAF Plant Database.
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10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

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

Answer / Justification:

"Chinese and Japanese wisterias are hardy and aggressive, capable of forming thickets so dense that little else grows."

Reference(s):

- Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
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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 *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Vegetative reproduction is their primary means of expansion. Numerous stolons, or above-ground stems, develop roots and shoots at short intervals." " Although seeds are produced in favorable conditions, vegetative growth is the main method of wisteria spread" "It spreads by above ground runners and occasionally by gravity or water-dispersed seed."

Reference(s):

- Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
 - Stone, K. R. (2009). *Wisteria floribunda*, *W. sinensis*. In: Fire Effects Information System.
 - CABI (0). *Wisteria sinensis* (Chinese wisteria) - CABI.
-

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 *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"Numerous stolons, or above-ground stems, develop roots and shoots at short intervals."

Reference(s):

- Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
-



13. Does the species (or cultivar or variety) commonly produce viable seed?

- 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:

"Abundant seeds may also be produced if conditions are favorable"

Reference(s):

- Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
-

14. Does this plant produce copious viable seeds each year (> 1000)?

- 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:

"Abundant seeds may also be produced if conditions are favorable." "racemes to 30cm in length." It is not clear how many seeds a single plant produces, but plants can grow very large, producing large quantities of flowers in racemes up to a foot long. Each flower produces fruit with 1 to 3 seeds. It is highly likely that a mature plant could produce at least 1000 seeds in a year.

Reference(s):

- Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
 - Royal Horticultural Society (0). *Wisteria sinensis* \textbar Chinese wisteria/RHS Gardening.
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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: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"The seed does not exhibit any dormancy habits. It can be sown as soon as it is ripe in a cold frame and should germinate in the spring."

Reference(s):

- Plants For A Future (PFAF) (0). *Wisteria sinensis* Chinese *Wisteria* PFAF Plant Database.
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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:

"It can be slow to establish. Although vines may produce flowers by the second or third year after planting, it may take much longer (sometimes up to 15 years). Plants grown from seed may take up to 20 years to flower." "Plants are very slow from seed and can take up to 20 years to come into flower"

Reference(s):

- Missouri Botanical Garden (0). *Wisteria sinensis* - Plant Finder.
 - Plants For A Future (PFAF) (0). *Wisteria sinensis* Chinese *Wisteria* PFAF Plant Database.
-



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 *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"Bloom Time: May to June" "Flowers give way to pendant, velvety, bean-like seed pods (4-6" long) which ripen in autumn and may persist into winter." " Fl. Apr-May, fr. May-Aug."

Reference(s):

- Missouri Botanical Garden (0). *Wisteria sinensis* - Plant Finder.
 - eflora.org (0). *Wisteria sinensis* in Flora of China @ efloras.org.
-

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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Large seed size a deterrent to animal dispersal." Seeds are dispersed by "forceful dehiscence". "The hard, rounded seeds, when the pod opens, can fly 10 feet across a room."

Reference(s):

- Russell, P., & Musil A. (1961). Plants Must Disperse Their Seeds. Yearbook of Agriculture. 80-88.
 - Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
-



19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?

- 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:

"In riparian habitats, seeds may be carried downstream in water for great distances." "Wisteria pods and seeds are large and heavy, which limits dispersal by birds and mammals. Seeds are water-dispersed along riparian areas and can travel great distances this way" "It spreads by above ground runners and occasionally by gravity or water-dispersed seed." "Some fruits, as they dry, open explosively expelling their seeds. The pods of many legumes (e.g., wisteria) do this." Seeds are dispersed by "forceful dehiscence". "The hard, rounded seeds, when the pod opens, can fly 10 feet across a room."

Reference(s):

- Russell, P., & Musil A. (1961). Plants Must Disperse Their Seeds. Yearbook of Agriculture. 80–88.
 - Biology-pages.info (2015). Sexual Reproduction in Angiosperms.
 - Texas Invasives (0). Texas Invasives *Wisteria sinensis*.
 - Stone, K. R. (2009). *Wisteria floribunda*, *W. sinensis*. In: Fire Effects Information System.
 - CABI (0). *Wisteria sinensis* (Chinese wisteria) - CABI.
-

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 *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of this.

Reference(s):

- [Anonymous] .



Total PRE Score

PRE Score: 21 -- Reject (high risk of invasiveness)

Confidence: 78 / 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:

- Hans Landel December 18, 2017
- Steve Moore October 4, 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.