Plant Risk Evaluator -- PRE™
Evaluation Report

Triadica sebifera -- Georgia

2017 Farm Bill PRE Project

PRE Score: 19 -- Reject (high risk of invasiveness)
Confidence: 73 / 100
Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: November 6, 2017

This PDF was created on August 13, 2018

Plant Evaluated

Triadica sebifera

Image by Pollinator at English Wikipedia

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Triadica sebifera*) 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

The rapid growth, prolific seeding, and dispersal of seeds through avian and water vectors are all contributors to the high invasiveness of the Chinese Tallow tree (Triadica sebifera). This species is highly invasive in several states throughout the Southeastern United States and is listed as a category 1 species by the Georgia EPPC, "Exotic plant that is a serious problem in Georgia natural areas by extensively invading native plant communities and displacing native species." T. sebifera is a large concern for Georgia and many other states, and should not be grown.

General Information

Status: Submitted
Screener: Lila Uzzell
Evaluation Date: November 6, 2017

Plant Information

Plant: *Triadica sebifera*

Regional Information

Region Name: Georgia

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

Answer / Justification:

Native to China and Taiwan, Chinese tallowtree is now found in parts of Africa, Australia, and in the USA. In the U.S.: "Not only has Chinese tallow become naturalized in the southern coastal plain from South Carolina south to Texas, it has become naturalized in over half of the counties in Florida".

Reference(s):

- UF / IFAS Center for Aquatic and Invasive Plants (2018). Triadica sebifera – UF/IFAS Center for Aquatic and Invasive Plants.
- GBIF (0). Triadica sebifera (L.) Small.

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

Answer / Justification:

Though it grows in some areas outside of Georgias climate range, T. sebifera has become naturlized in the SE U.S., South Africa, Uruguay, and SE Australia.

Reference(s):

- GBIF (0). Triadica sebifera (L.) Small.

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

Answer / Justification:

In the U.S. this species is invasive in Alabama, Arkansas, California, Florida, Georgia, Louisiana, North Carolina, South Carolina, and Texas. Outside of the U.S. this species is invasive to Australia.

Reference(s):

- CABI (0). Sapium sebiferum (Chinese tallow tree) CABI.
- GBIF (0). Triadica sebifera (L.) Small.

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

Answer / Justification:

In the U.S. this species is invasive in Alabama, Arkansas, California, Florida, Georgia, Louisiana, North Carolina, South Carolina, and Texas. Due to Australia having a small area of similar climate to Georgia, it is hard to confirm that this species is invasive in the same climate there, but it can be assumed that it is.

Reference(s):

- CABI (0). Sapium sebiferum (Chinese tallow tree) CABI.
- GBIF (0). Triadica sebifera (L.) Small.

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

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

Answer / Justification:

This species does not have many close relatives, and none appear to be invasive, nor invasive in a similar climate (Note: searched under both Triadica and Sapium genus).

Reference(s):

- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..

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

Answer / Justification:

In the U.S. it is found predominately in a climate matching Georgias region, and outside of the U.S. it is found in the similar climates of Uruguay, South America, and Australia. The areas outside of its climate range where it is found include Saudi Arabia, Brazil, and India.

Reference(s):

- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..
- GBIF (0). Triadica sebifera (L.) Small.

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

Answer / Justification:

This species can cover vast areas of forest floor and dominate over native plants. "Chinese tallow will transform native habitats into monospecific (single species) tallow forests in the absence of land management practices. Chinese tallow alters light availability for other plant species. Fallen tallow leaves contain toxins that create unfavorable soil conditions for native plant species. Chinese tallow will outcompete native plant species, reducing habitat for wildlife as well as forage areas for livestock."

Reference(s):

- Texas Invasive Species Institute (2014). Chinese Tallow: Texas Invasive Species Institute.
- UF / IFAS Center for Aquatic and Invasive Plants (2018). Triadica sebifera – UF/IFAS Center for Aquatic and Invasive Plants.
- TexasInvasives.org (2007). Texas Invasives - Chinese tallow.

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

Answer / Justification:

There is no evidence of Chinese tallow promoting or changing fire regimes, but this tree does regenerate quickly after fire events and can overtake other native trees or plants after a fire.

Reference(s):

- Meyer, R. (2011). Triadica sebifera. 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 *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Chinese tallow is a health risk to humans and animals and can affect grazing systems. The leaves and fruit of T. sebifera are toxic to cattle/livestock and can cause vomiting in humans. "Chinese tallow will outcompete native plant species, reducing habitat for wildlife as well as forage areas for livestock" (Texas Invasives 2007).

Reference(s):

- TexasInvasives.org (2007). Texas Invasives - Chinese tallow.
- UF / IFAS Center for Aquatic and Invasive Plants (2018). Triadica sebifera – UF/IFAS Center for Aquatic and Invasive Plants.

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

Answer / Justification:

Though this species outcompetes native species and has the capability of creating monospecific forests, there is no evidence of this species producing impenetrable thickets that block the movement of animals.

Reference(s):

- TexasInvasives.org (2007). Texas Invasives - Chinese tallow.

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

Answer / Justification:

"Chinese tallow spreads locally by root sprouts [69,126] and has strong sprouting capabilities following damage [20,38,69,126]. Root sprouting up to 16 feet (5 m) from the tree trunk has been reported [67]. Near the coast in eastern Texas, Chinese tallow sprouted prolifically within a month of cutting [170]. "

Reference(s):

- Meyer, R. (2011). Triadica sebifera. In: Fire Effects Information System.

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

Answer / Justification:

Though T. sebifera are capable of regenerating vegetatively, it seems as though this is only common after being cut, and is thus not a naturally occuring process.

Reference(s):

- [Anonymous] .

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

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

Answer / Justification:

"Viability of evaluated seeds from horticultural trees was 95% [15]. According to the Woody Plant Seed Manual, Chinese tallow seed viability is 90% (Bonner 1974 cited in [14])."

Reference(s):

- Meyer, R. (2011). Triadica sebifera. In: Fire Effects Information System.

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

- 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:

This tree produces copious amounts of seeds each year. "Mean Chinese tallow seed crop in a 16,900-foot² (1,570 m²) area of coastal South Carolina was estimated at 1,681,000 seeds [151]. In a Chinese tallow-dominated forest in southeastern Texas, estimated Chinese tallow seed production was 327,670 seeds/year or 273 seeds/m²/year."

Reference(s):

- Meyer, R. (2011). Triadica sebifera. In: Fire Effects Information System.

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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 / Justification:

lack of information.

Reference(s):

- [Anonymous] .

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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: **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 tallow likely begins producing seed when 3 to 8 years old".

Reference(s):

- Meyer, R. (2011). Triadica sebifera. In: Fire Effects Information System.

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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: **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 tallow flowers from April until June and produces fruit from August to January in the southeastern United States".

Reference(s):

- Meyer, R. (2011). Triadica sebifera. In: Fire Effects Information System.

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: **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:

" Birds removed an estimated 675,000 (SD 56,000) Chinese tallow seeds (about 40% of the total seed crop) in a South Carolina study area".

Reference(s):

- Meyer, R. (2011). Triadica sebifera. In: Fire Effects Information System.

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

Answer / Justification:

"Chinese tallow seeds are dispersed by water... Chinese tallow seeds soaked in water for 30 days had higher germination rates than unsoaked seeds".

Reference(s):

- Meyer, R. (2011). Triadica sebifera. In: Fire Effects Information System.

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

Answer / Justification:

Lack of evidence for this.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 19 -- Reject (high risk of invasiveness)
Confidence: 73 / 100
Questions answered: 19 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:

• David Coyle	February 21, 2018
• John "Doc" Ruter	January 10, 2018

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.