



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

Phellodendron amurense -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 14 -- Evaluate this plant further

Confidence: 69 / 100

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

Privacy: Public

Status: Completed

Evaluation Date: March 15, 2017

This PDF was created on June 15, 2018



Plant Evaluated

Phellodendron amurense



Image by Richard Webb



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Phellodendron amurense*) 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

Phellodendron amurense is considered to be invasive in a few US states, primarily in the Eastern US. Part of the issue with this plant is that it is dioecious, meaning it has male and female flowers on separate trees. This means that male trees will be significantly less invasive than female trees, and in fact in states where the tree is regulated the male trees are usually permitted (or encouraged as alternatives to invasive tree species). The female trees produce copious amounts of viable seed that is distributed by birds, which is why the tree is one to watch in Minnesota. Like other states, the female trees could be regulated with male trees being approved for sale.

General Information

Status: Completed

Screener: Dan Miller

Evaluation Date: March 15, 2017

Plant Information

Plant: *Phellodendron amurense*

Regional Information

Region Name: Minnesota



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:

Phellodendron amurense seedlings, saplings, and small trees have been found growing throughout the natural areas of the Minnesota Landscape Arboretum.

Reference(s):

- Miller, D. R. (2016). Potential Invasiveness of the Amur Corktree in Minnesota. (DeVries, R., & Malysza J., Ed.). Upper Midwest Invasive Species Conference.
 - United States Department of Agriculture (2007). Plants Profile for *Phellodendron amurense* (Amur corktree).
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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:

It has been reported to be invasive in Illinois, New York, Pennsylvania, Virginia, Massachusetts, and Wisconsin. The reference cited here reports naturalized populations in New York, Pennsylvania, and Connecticut.



Reference(s):

- Morgan, E. C. (2012). The Invasion of *Phellodendron amurense* into the Urban and Suburban Woodlands of the New York Region. *Urban Habitats*. 2012,
 - Simons, D. (2006). Fact Sheet:Amur Corktree. *Weeds Gone Wild: Alien Invaders of Natural Areas*. 2006,
-

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 **Very High** confidence in this answer based on the available literature.

Answer / Justification:

It has been reported to be invasive in Illinois, New York, Pennsylvania, Virginia, and Massachusetts. Also invasive in Wisconsin.

Reference(s):

- United States Department of Agriculture (2007). Plants Profile for *Phellodendron amurense* (Amur corktree).
 - Wisconsin Department of Natural Resources (2015). Amur cork tree - Wisconsin DNR.
 - Wisconsin Legislative Reference Bureau (2017). Chapter NR40 - Invasive Species Identification, Classification and Control.
 - Simons, D. (2006). Fact Sheet:Amur Corktree. *Weeds Gone Wild: Alien Invaders of Natural Areas*. 2006,
-

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 **Very High** confidence in this answer based on the available literature.



Answer / Justification:

This species is dioecious. Male trees are not invasive. Wisconsin reports Amur corktree as a prohibited invasive plant; however, male cultivars are exempt.

Reference(s):

- Wisconsin Department of Natural Resources (2015). Additional Regulated Invasive Plants of WI.
 - Wisconsin Department of Natural Resources (2015). Amur cork tree - Wisconsin DNR.
 - Wisconsin Legislative Reference Bureau (2017). Chapter NR40 - Invasive Species Identification, Classification and Control.
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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 *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

Most of the locations in GBIF are on the east coast which does not have a climate that matches Minnesota.



Reference(s):

- GBIF (0). GBIF Distribution Map for *Phellodendron amurense*.
-

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

Answer / Justification:

Amur corktrees outcompete native tree and shrub species including oaks and hickories in forested natural areas and can form dense stands that displace native plants. It may inhibit and suppress regeneration of overstory canopy trees.

Reference(s):

- Simons, D. (2006). Fact Sheet:Amur Corktree. Weeds Gone Wild: Alien Invaders of Natural Areas. 2006,
 - Invasive Plant Atlas of the United States (2016). Amur corktree: *Phellodendron amurense* (Sapindales: Rutaceae): Invasive Plant Atlas of the United States.
 - Gaetzke, C., & Lower Chippewa Invasives Partnership (2016). Other Invasives Found in West Central Wisconsin.
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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 *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There are no references for *Phellodendron amurense* promoting or changing fire regimes.



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: **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 are no references indicating that *Phellodendron amurense* is a health risk to humans or animals. To the contrary, the bark is known to have beneficial medicinal properties and is often used in Chinese traditional medicine

Reference(s):

- [Anonymous] .
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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 *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

There is no mention of this species producing impenetrable thickets. Although new seedlings may be dense, the saplings and small trees are not found in dense clusters.

Reference(s):

- [Anonymous] .



Reproductive Strategies (Questions 11 - 17)

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

- Answer: **No**, which contributes **0** points to the total PRE score.
- The screener has not provided a confidence score on this question. Consider creating an issue on PRE so the screener can become aware of this detail.

Answer / Justification:

Although this species can be propagated vegetatively, there is no mention in the literature that it spreads by root suckers or any other vegetative means.

Reference(s):

- [Anonymous] .
-

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 not provided a confidence score on this question. Consider creating an issue on PRE so the screener can become aware of this detail.

Answer / Justification:

There are no references of *Phellodendron amurense* producing new plants this way.

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

Answer / Justification:

Seed produced from this species germinates well without pretreatment.

Reference(s):

- Read, R. A., & Zasada J. C. (2008). *Phellodendron amurense* Rupr.. The Woody Plant Seed Manual. Agricultural Handbook 727, 783 - 785.
 - USDA Forest Service, Forest Health Staff (2005). Microsoft Word - Amur corktree.doc - amur-corktree.pdf.
-

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

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

Answer / Justification:

Each tree can easily produce thousands of drupes (see images attached). Each fruit usually contains two or three full-sized seeds.

Reference(s):

- Read, R. A., & Zasada J. C. (2008). *Phellodendron amurense* Rupr.. The Woody Plant Seed Manual. Agricultural Handbook 727, 783 - 785.
 - LeClair, C. (2011). *Phellodendron amurense* Rupr. Weed Risk Assessment -- Wisconsin DNR.
-



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

Answer / Justification:

Seed produced from this species germinates well without pretreatment; however, germination can be improved following stratification.

Reference(s):

- Read, R. A., & Zasada J. C. (2008). *Phellodendron amurense* Rupr.. The Woody Plant Seed Manual. Agricultural Handbook 727, 783 - 785.
 - Watson, E. F. Gilman, & G. D. (2015). *Phellodendron amurense*: Amur Corktree.
-

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

Answer / Justification:

One reference reports that in forests, Amur corktree reaches reproductive maturity at about 3 to 5 years of age; however, another reference states that the minimum seed-bearing age is 7 to 13 years.

Reference(s):

- Simons, D. (2006). Fact Sheet:Amur Corktree. Weeds Gone Wild: Alien Invaders of Natural Areas. 2006,
 - Read, R. A., & Zasada J. C. (2008). *Phellodendron amurense* Rupr.. The Woody Plant Seed Manual. Agricultural Handbook 727, 783 - 785.
-



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:

Phellodendron amurense trees produce flowers in May and June and from mid-June to mid-July, female trees produce abundant clusters of fruit which may remain on the tree until early winter.

Reference(s):

- Simons, D. (2006). Fact Sheet:Amur Corktree. Weeds Gone Wild: Alien Invaders of Natural Areas. 2006,
-

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

Answer / Justification:

The trees produce abundant seed which is dispersed by birds (northern robins, etc.) and probably by water via streams and other drainages.

Reference(s):

- Simons, D. (2006). Fact Sheet:Amur Corktree. Weeds Gone Wild: Alien Invaders of Natural Areas. 2006,
 - Watson, E. F. Gilman, & G. D. (2015). *Phellodendron amurense*: Amur Corktree.
-



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

Answer / Justification:

Although seed may be dispersed by water via streams and drainages, it is probably not a common occurrence.

Reference(s):

- [Anonymous] .
-

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 information of Amur corktree being distributed by contaminated seed, equipment, vehicles, boats, or clothing/shoes.

Reference(s):

- [Anonymous] .
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Total PRE Score

PRE Score: 14 -- Evaluate this plant further

Confidence: 69 / 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:

- Angelique Dahlberg December 11, 2017
- Tom Buechel November 9, 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.

Issue ID # 6129

Date Created: December 11, 2017 - 7:52am

Date Updated: December 18, 2017 - 8:35am

Submitted by: Angelique Dahlberg

Status: Fixed

Type: Comment

Severity: Minor

Scope: Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

Issue Description

The Lower Chippewa Invasives Partnership in WI has also found it to outcompete and displace native species: <https://lcinvasives.org/invasives/other-invasives/>

Issue Resolution (Screener's Response to Issue)

Issue resolved by PRE Data Manager -- source added to Q7.

Issue ID # 6128

Date Created: December 11, 2017 - 7:41am

Date Updated: December 18, 2017 - 8:25am

Submitted by: Angelique Dahlberg

Status: Fixed



Type: Comment

Severity: Minor

Scope: Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

Issue Description

Amur cork tree is also invasive in Wisconsin:

1. <http://www.ipaw.org/portals/ipaw/IPAW%20Newsletter39.pdf?ver=2016-02-06-090706-193> (see page 7)
2. <https://forestrynews.blogs.govdelivery.com/2017/04/25/amur-cork-tree-is-an-emerging-threat-to-wisconsin-forests/>
3. http://docs.legis.wisconsin.gov/code/admin_code/nr/001/40.pdf (NR 40.04 Prohibited category. 29h.)

Issue Resolution (Screener's Response to Issue)

Issue resolved by PRE Data Manager -- added that amur cork tree is also invasive in WI to Q3 -- linked Wisconsin DNR source from Q4 and added source #3 listed above to Q3

Issue ID # 3183

Date Created: May 12, 2017 - 9:51am

Date Updated: December 15, 2017 - 11:12am

Submitted by: Angelique Dahlberg

Status: Fixed

Type: Suggestion

Severity: Minor

Scope: Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

Issue Description

Amur cork tree is also invasive in Wisconsin: <https://lcinvasives.org/2017/01/05/wcwipma-news/>

Issue Resolution (Screener's Response to Issue)

Issue resolved by PRE Data Manager -- link in Issue Description does not work, but added that amur cork tree is also invasive in WI and added Wisconsin DNR source to Q3.





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.