



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

Berberis thunbergii 'Crimson Pygmy' -- Georgia

2017 Farm Bill PRE Project

PRE Score: 14 -- Evaluate this plant further

Confidence: 61 / 100

Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public

Status: Submitted

Evaluation Date: July 17, 2017

This PDF was created on August 13, 2018



Plant Evaluated

Berberis thunbergii 'Crimson Pygmy'



Image by Gardenia



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Berberis thunbergii* 'Crimson Pygmy') 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

Berberis thunbergii 'Crimson Pygmy' is a dwarf cultivar that differs from the parent species in size and leaf color only. 'Crimson Pygmy' It is not a sterile cultivar, fruits persist on the stem from fall through winter, and therefore there is no reduced fecundity seen with this cultivar. There may be some potential decrease in invasiveness due to its reduction in height and spread. The screening was conducted primarily using parent species resources, as it is assumed most of the taxonomic and botanical characteristics of the parent species are shared by cultivar (excluding plant height, spread and leaf colour). This is in line with the suggested method for screening cultivars outlined by PRE, and all questions indicate which type of resource was used. However using this method this PRE (14) is almost exactly the same as the one conducted already on *Berberis thunbergii* (15), and is a good example of how well PRE handles cultivars. It was helpful to include Q7 and Q10, because i felt like by answering "No" to these questions i could address the effect the shortened habit and reduction in spread would have on the potential invasiveness of the dwarfed cultivar. It should be noted that those cultivars that have reduced fecundity via sterility or lower fruit number would have at least 5 questions that show the effect (seed biology related questions). I think the rating over all is fair, given that the cultivar is a dwarf and may negate some issues with dense stands being formed, however it is still presumed that there is a high seed count, and therefore should be used with caution. As advised in the PRE for the parent species, it may be worth exploring sterile cultivars as well.

General Information

Status: Submitted

Screener: Kylie Bucalo

Evaluation Date: July 17, 2017

Plant Information

Plant: *Berberis thunbergii* 'Crimson Pygmy'

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

Dwarf (reported spread of 2-3 feet) with deep crimson leaves.



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

Answer / Justification:

Parent species used. Taken from Silander and Klepeis et al. 1999. " Since 1910 it has become fully naturalized throughout most of the Northeast"

Reference(s):

- Silander, J. A., & Klepeis D. M. (1999). The invasion ecology of Japanese barberry (*Berberis thunbergii*) in the New England landscape. *Biological invasions*. 1, 189–201.
-

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



Answer / Justification:

Parent species used. EDD MapsS reference shows distribution matches region of concern (though many resources contradict whether or not the plant is yet to be found in Northern counties of Georgia). EDD MapsS also suggests distribution of Japanese Burberry in areas that are shown to match the region of concern via the climate match tool such as North Carolina and South Carolina. The datasheet report reference from the Invasive species Compendium also shows that *Berberis thunbergii* was introduced and naturalized in Europe, and more specifically south-western Germany. Plant right climate match tool identifies portions of south western Germany as a match to the region of concern (GA). I cannot gain access to the resource given for this distribution in Germany of *Berberis thunbergii* (öcker R, Dirk M, 1998. Distribution and spreading of alien trees and shrubs in south western Germany and contributions to germination biology. In: Starfinger U, Edwards K, Kowarik I, Williamson M, eds. Plant Invasions: Ecological Mechanisms and Human Responses. Leiden, The Netherlands: Backhuys Publishers, 285-297), so I am unable to confirm with 100% certainty that the climate match tool is highlighting the same area in Germany as the distribution given in the resource. Therefore my Confidence level is medium for this question. GISD references Germany distribution as well, long with Distribution in New South Wales, Australia. Northern parts of this Australian state are matched to our region of concern in the climate tool.

Reference(s):

- Global Invasive Species Database (0). GISD.
 - EDDMapS (0). Japanese barberry (*Berberis thunbergii*) - EDDMapS State Distribution.
 - CABI (0). Datasheet report for *Berberis thunbergii* (Japanese barberry).
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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 *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Parent species used. Taken from Silander and Klepeis et al. 1999. " Since 1910 it has become fully naturalized throughout most of the Northeast, and has been characterized as an extremely invasive species".

Reference(s):

- Silander, J. A., & Klepeis D. M. (1999). The invasion ecology of Japanese barberry (*Berberis thunbergii*) in the New England landscape. *Biological invasions*. 1, 189–201.
- EDDMapS (0). *Berberis thunbergii*- Invasive Plant Atlas New England.



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

Answer / Justification:

Parent species used. GISD lists the species as established and Invasive in North Carolina, which matches the region of concern according to the climate match map. Other websites show distribution into NC but do not mention its invasiveness, therefore CI is medium. Additionally species is listed as invasive in South Carolina and Tennessee (these states are also climate matches to Georgia, but again only partial matches...not entire state).

Reference(s):

- Global Invasive Species Database (0). GISD.
-

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:

Berberis vulgaris a non-native invasive is distributed in South Carolina, which matches the region of concern in the climate matching tool. Additionally some sources show distribution of *Berberis vulgaris* extending into North Carolina and Virginia, both which match the region of concern.

Reference(s):

- EDDSMaP (0). *Berberis vulgaris*- Invasive Plant Atlas of New England.
 - USDA Plants Database (0). Plants Profile for *Berberis vulgaris* (common barberry)- USDA.
-



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

Answer / Justification:

This was hard to assess for this species. Many regions where it is distributed are a climate match to the region of concern. However it is too hard to ascertain the exact distribution and climate match beyond the level of country outside the US. I do not think I have enough information to conclusively say that over 50% of its distribution is a climate match to GA, but it may be fairly close. Distribution in the US is scattered across several matching states.

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

Cultivar used. None of the resources state this, however the "No" answer is more inferred from the plant's biology rather than from any evidence in references. Form and habit are described as dwarfed, round and compact, which leads the reviewer to believe if escaped it is less likely to be able to smother/ grow over other species/ form large dense stands.



Reference(s):

- Gardenia.net (0). *Berberis thunbergii* 'Crimson Pygmy' (Japanese Barberry)_gardenia.net.
 - Magnolia Gardens Nursery (0). *Berberis thunbergii* 'Crimson Pygmy' Crimson Pygmy Barberry - Magnolia Gardens Nursery.
 - North Carolina State University Extension (0). *Berberis thunbergii* 'Crimson Pygmy'_NC state.
-

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

Answer / Justification:

There is no evidence of this.

Reference(s):

- [Anonymous] .
-

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 is no evidence of this.

Reference(s):

- [Anonymous] .
-



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

Answer / Justification:

Cultivar used. There is no evidence of this. None of the resources state this, however the "No" answer is more inferred from the plant's biology rather than from any evidence in references. Form and habit are described as dwarfed (round and compact), which leads the reviewer to believe if escaped it is less likely to be able to smother/ grow over other species/ form large dense stands.

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

Parent species (tried to find info on cultivar to see if it mentioned this but no cv. resources talked about veg repro). Parent species Japanese Barberry spreads predominately through seed dispersal, but can spread by vegetative expansion. Vegetative spread is through branches touching the ground that can root to form new plants. This is taken from this resource but many other resources also note this, and describe the vegetative spread as "creeping roots", or "root creepers" or "tip rooting branches".

Reference(s):

- Silander, J. A., & Klepeis D. M. (1999). The invasion ecology of Japanese barberry (*Berberis thunbergii*) in the New England landscape. *Biological invasions*. 1, 189–201.
-



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

Answer / Justification:

There is no evidence of this. Parent species used.

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

Cultivar info used.

Reference(s):

- Gardenia.net (0). *Berberis thunbergii* 'Crimson Pygmy' (Japanese Barberry)_gardenia.net.
 - Magnolia Gardens Nursery (0). *Berberis thunbergii* 'Crimson Pygmy' Crimson Pygmy Barberry - Magnolia Gardens Nursery.
 - North Carolina State University Extension (0). *Berberis thunbergii* 'Crimson Pygmy'_NC state.
-

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



Answer / Justification:

Parent and cultivar used. Both resources indicate high yields through description, no exact fruit number count. Excerpt from Gardenia.net describes "Crimson Pygmy" cultivar as having an abundant fruit crop.

Reference(s):

- Gardenia.net (0). *Berberis thunbergii* 'Crimson Pygmy' (Japanese Barberry)_gardenia.net.
 - Magnolia Gardens Nursery (0). *Berberis thunbergii* 'Crimson Pygmy' Crimson Pygmy Barberry - Magnolia Gardens Nursery.
 - North Carolina State University Extension (0). *Berberis thunbergii* 'Crimson Pygmy'_NC state.
 - Silander, J. A., & Klepeis D. M. (1999). The invasion ecology of Japanese barberry (*Berberis thunbergii*) in the New England landscape. *Biological invasions*. 1, 189–201.
 - EDDSMaP (0). *Berberis thunbergii*- Invasive Plant Atlas New England.
 - CABI (0). Datasheet report for *Berberis thunbergii* (Japanese barberry).
 - Plant Conservation Alliance@s Alien Plant Working Group (0). PCA Fact sheet: Japanese Barberry.
-

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:

Parent species. Japanese barberry need cold stratification for germination, and it is suggested that this requirement might hamper the spread of this plant into warmer southern climates in the US. There is no reason to think this requirement is different for the cultivar seeds.

Reference(s):

- Silander, J. A., & Klepeis D. M. (1999). The invasion ecology of Japanese barberry (*Berberis thunbergii*) in the New England landscape. *Biological invasions*. 1, 189–201.
 - NPS (0). PCA Alien Plant Working Group - Japanese Barberry (*Berberis thunbergii*).
 - Plant Conservation Alliance@s Alien Plant Working Group (0). PCA Fact sheet: Japanese Barberry.
-



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 / Justification:

Leave blank. no info found

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

Yes. Cultivar used. Fruits persist on the stem from fall through winter.

Reference(s):

- Gardenia.net (0). *Berberis thunbergii* 'Crimson Pygmy' (Japanese Barberry)_gardenia.net.
 - Magnolia Gardens Nursery (0). *Berberis thunbergii* 'Crimson Pygmy' Crimson Pygmy Barberry - Magnolia Gardens Nursery.
 - North Carolina State University Extension (0). *Berberis thunbergii* 'Crimson Pygmy'_NC state.
-



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

Answer / Justification:

Cultivar used. resources conflict on whether they are attractive to birds. one says yes and one says no. Parent species says seeds are spread by bird but most seedling do not travel very far from the adult plant. So its YES but with very low confidence. could be changed if stakeholder disagrees.

Reference(s):

- Gardenia.net (0). *Berberis thunbergii* 'Crimson Pygmy' (Japanese Barberry)_gardenia.net.
 - Magnolia Gardens Nursery (0). *Berberis thunbergii* 'Crimson Pygmy' Crimson Pygmy Barberry - Magnolia Gardens Nursery.
 - North Carolina State University Extension (0). *Berberis thunbergii* 'Crimson Pygmy'_NC state.
-

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

Answer / Justification:

There is no evidence of this

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 evidence of this.

Reference(s):

- [Anonymous] .
-

Total PRE Score

PRE Score: 14 -- Evaluate this plant further

Confidence: 61 / 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:

- Timothy Daly January 2, 2018
- Timothy Daly January 2, 2018
- Brian Jernigan November 21, 2017

This evaluation has a total of 3 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 # 5905

Date Created: November 21, 2017 - 6:04am

Date Updated: February 16, 2018 - 11:04am

Submitted by: Brian Jernigan

Status: Fixed

Type: Suggestion

Severity: Minor

Scope: Q04. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

Issue Description

The referenced item for North Carolina does not indicate where in North Carolina the plant has become invasive, not all of North Carolina falls within the PRE climate area.

Issue Resolution (Screener's Response to Issue)

Have added two more states where the parent species is listed as invasive (Tennessee and South Carolina). Both of these states are also only partial matches, but this is stated in the comments.



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.