



*Plant Risk Evaluator -- PRETM
Evaluation Report*

***Berberis thunbergii* 'Bagatelle' -- Minnesota**

2017 Farm Bill PRE Project

PRE Score: 14 -- Evaluate this plant further

Confidence: 71 / 100

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

Privacy: Public

Status: Submitted

Evaluation Date: August 15, 2017

This PDF was created on June 15, 2018



Plant Evaluated

Berberis thunbergii 'Bagatelle'



Image by MBOT



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Berberis thunbergii* 'Bagatelle') 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 'Bagatelle' is very similar to B. 'Crimson Pygmy' in growth and overall physiology. The difference being that 'Bagatelle' has leaves that are deeper red in color and perhaps has a more compact and pyramidal growth pattern. As a relatively slow grower, 'Bagatelle' will initially produce less seed than other thunbergii cultivars, but seed production increases as growth increases. As with all thunbergii cultivars, 'Bagatelle' has the potential to cross pollinate with other cultivars to produce hybrids of unknown fecundity. As with 'Crimson Pygmy', 'Bagatelle' is unlikely to reproduce completely true to seed, meaning some percentage of seedlings could revert to the straight species, or possibly even the green form, which are known to be invasive.

General Information

Status: Submitted

Screener: Mike Monterusso

Evaluation Date: August 15, 2017

Plant Information

Plant: *Berberis thunbergii* 'Bagatelle'

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

B. 'Bagatelle' is similar to the parent species in physiology. Like 'Crimson Pygmy', it is relatively small and a slow grower and reportedly produces very little seed. The answer to many of the questions will be the same as for 'Crimson Pygmy'.

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

Answer / Justification:

Possibly. The parent species has certainly naturalized in many areas of North America and China. However, given the low fecundity rate of 'Bagatelle', the level at which this cultivar has contributed to the naturalization of the overall genus is perhaps limited.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Berberis thunbergii* (Japanese barberry).
 - Wikipedia (2017). *Berberis thunbergii*.
-

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



Answer / Justification:

Yes, regarding the parent species. However... "A team of scientists at the University of Connecticut identified 7 cultivars of Japanese barberry which were determined to be less invasive than other cultivars because of lower seed production. The following cultivars were determined to be the lowest seed-producing: Lime Glow, Sunstation, Helmond Pillar, Royal Burgundy, Gold Nugget, Aurea, and Bagatelle."

Reference(s):

- Matson, E. (2011). *Berberis thunbergii* DC Weed Risk Assessment -- Wisconsin DNR.
-

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:

See Q2.

Reference(s):

- Matson, E. (2011). *Berberis thunbergii* DC Weed Risk Assessment -- Wisconsin DNR.
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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 *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The parent plant, *Berberis thunbergii* is noted as invasive in Wisconsin and Minnesota. That said, a list of suggested restricted cultivars in Minnesota does not include 'Bagatelle'.



Reference(s):

- Minnesota Department of Agriculture (2017). Japanese Barberry.
 - Wisconsin Department of Natural Resources (2015). Japanese barberry - Wisconsin DNR.
-

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:

The parent species (wild type) and several cultivars are noted as invasive in Minnesota and Wisconsin.

Reference(s):

- Minnesota Department of Agriculture (2017). Japanese Barberry.
 - Wisconsin Department of Natural Resources (2015). Japanese barberry - Wisconsin DNR.
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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 **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The parent species (wild type) is not predominately in a region with a climate matching the region of concern.

Reference(s):

- GBIF Secretariat (2017). *Berberis thunbergii* DC. - Checklist View.



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

Answer / Justification:

'Crimson Pygmy' does not show this characteristic specifically. However, wild type parent species does.

Reference(s):

- Wisconsin Department of Natural Resources (2015). Japanese barberry - Wisconsin DNR.
-

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

Answer / Justification:

"Japanese barberry generally invades areas that rarely burn and does not seem to increase the threat of fire"

Reference(s):

- Zouhar, K. (2008). *Berberis thunbergii*. In: Fire Effects Information System.
-



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:

Hand-cutting of established clumps is difficult and time consuming due to the long, arching stems and prolific thorns. *Berberis* spp was reported to be mildly toxic.

Reference(s):

- Zouhar, K. (2008). *Berberis thunbergii*. In: Fire Effects Information System.
 - Resources, University of California Agriculture (2017). Toxic Plants (by common name).
-

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

Answer / Justification:

No evidence found for 'Crimson Pygmy' specifically. However, the wild type parent does.

Reference(s):

- Zouhar, K. (2008). *Berberis thunbergii*. In: Fire Effects Information System.
-



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

Answer / Justification:

The parent type was used to answer this question. "Vegetative propagation is also an option for this adaptable plant. Any stem that touches the ground can root, as can any bits of root left in the ground after pulling up a plant."

Reference(s):

- Harmon, E. (2006). Invasion Biology Introduced Species Summary Project - Columbia University.
 - Wisconsin Department of Natural Resources (2015). Japanese barberry - Wisconsin DNR.
-

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

Answer / Justification:

While *Berberis* spp. can reproduce vegetatively, this is not the primary, natural method of reproduction, which is by seed.

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

Answer / Justification:

Fecundity of a variety of cultivars was published in a 2012 study. There is evidence in the study that 'Bagatelle' increases significantly after 5 years of age.

Reference(s):

- Brand, M. H., Lehrer J. M., & Lubell J. D. (2012). Fecundity of Japanese Barberry (*Berberis thunbergii*) Cultivars and Their Ability to Invade a Deciduous Woodland. *Invasive Plant Science and Management*. 5, 464–476.
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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 **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Even after 5 years, 'Bagatell' was shows to produce

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:

"Overall, most barberry cultivars can be expected togerminate at 60% or higher under optimum germination conditions."



Reference(s):

- Brand, M. H., Lehrer J. M., & Lubell J. D. (2012). Fecundity of Japanese Barberry (*Berberis thunbergii*) Cultivars and Their Ability to Invade a Deciduous Woodland. *Invasive Plant Science and Management*. 5, 464–476.
-

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

Answer / Justification:

"They start producing fruits around 5 years of age."

Reference(s):

- Miller, D., Howe K., Cox H., & Jacquart E. (2005). Assessment of Japanese barberry (*Berberis thunbergii*) in Indiana's Natural Areas .
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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:

Berberis thunbergii blooms and sets seed once each spring.

Reference(s):

- [Anonymous] .



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

Answer / Justification:

While birds do not seem to be a significant vector for the expansion of specific *Berberis* spp. populations, they could contribute to the establishment of new populations some distance from the original plant. Consider the following: "...birds are the most common animal dispersers of barberries (*Berberis* spp.). Birds that disperse barberries either feed directly on the fruit pulp and discard the seeds locally or ingest the entire fruit and defecate the seeds elsewhere... The brightly colored fruits of Japanese barberry are available to birds throughout the winter, but they do not seem to be preferred and are generally a low-priority food item for many birds."

Reference(s):

- Zouhar, K. (2008). *Berberis thunbergii*. 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: **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:

No evidence found.

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

Answer / Justification:

While no reference to 'Crimson Pygmy' specifically was found, Wisconsin DNR reported that the parent species could be disbursed by humans.

Reference(s):

- Matson, E. (2011). *Berberis thunbergii* DC Weed Risk Assessment -- Wisconsin DNR.
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Total PRE Score

PRE Score: 14 -- Evaluate this plant further

Confidence: 71 / 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:

- Matthew Kaproth
January 22, 2018
- Tom Buechel
November 10, 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 # 5799

Date Created: November 10, 2017 - 7:41am

Date Updated: November 30, 2017 - 7:45am

Submitted by: Tom Buechel

Status: Fixed

Type: Comment

Severity: Minor

Scope: Evaluation as a whole

Issue Description

Berberis thunbergii is a known invasive. Any viable seed is likely to become a problem or continue to add to the existing problems. The dwarf cultivars typically produce few seeds or in some cases very few. However the rating fell into the category of acceptable which would trigger breeders to work on dwarf low fruiting selections instead of ones that produce seed that is not viable. I think this is important to note or at least get into the watch section to alert the right parties to a potential problem.

Issue Resolution (Screener's Response to Issue)

Agreed. The summary speaks to the potential contribution of this cultivar to the overall invasive problem of *B. thunbergii*. Question 4 was changed from "no" to "yes", which moved this plant into the "watch" category.



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.