Plant Risk Evaluator -- PRE™
Evaluation Report

Pyracantha coccinea -- Georgia

2017 Farm Bill PRE Project

PRE Score: 12 -- Accept (low risk of invasiveness)
Confidence: 58 / 100
Questions answered: 17 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: November 2, 2017

This PDF was created on August 13, 2018

Plant Evaluated

Pyracantha coccinea

Image by Petar43, Wikipedia user

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Pyracantha coccinea*) 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.

General Information

Status: Submitted
Screener: Lila Uzzell
Evaluation Date: November 2, 2017

Plant Information

Plant: *Pyracantha coccinea*

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:

In Georgia this species has been noted as a category 4 plant by the GA-EPPC, defined as "Category 4 - Exotic plant that is naturalized in Georgia but generally does not pose a problem in Georgia natural areas or a potentially invasive plant in need of additional information to determine its true status." This species also appears to be naturalized across Europe, Japan, South Africa, parts of Australia, and parts of South Africa.

Reference(s):

- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..
- Georgia Invasive Species Task Force (2017). List of Non-native Invasive Plants in Georgia - Georgia Invasive Species Task Force.
- GBIF (2017). Pyracantha coccinea M. J. Roemer.

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

Answer / Justification:

Map comparisons between the PlantRight Climate matching tool and GBIF show that P. coccinea is found in many areas within the same climate. GA has a climate between zones 7-9. The Missouri Botanical Gardens labels this shrub to be found in a similar climate zone, between zones 6-9.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

Reports from the Global Compendium of Weeds lists Pyracantha coccinea M.Roem. as invasive in South Africa, Columbia, Argentina, the Mediterranean, and Japan.

Reference(s):

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

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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: **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:

Reference results for this question are mixed. Areas that are similar in climate and list this species as invasive include the Mediterranean and Japan. However, the locations of this species in South Africa, Columbia, and Argentina that list P. coccinea as invasive do not match the PlantRight Climate results for GA. Additionally, CABI lists this species as an invasive in Cuba, which also does not match PlantRight results.

Reference(s):

- CABI (2017). Pyracantha coccinea (Scarlet firethorn).
- GBIF (2017). Pyracantha coccinea M. J. Roemer.

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

Answer / Justification:

Though many other species within the Pyracantha genus are naturalized in areas where they are not native, none are noted as invasive. P. angustifolia has been noted as the most weedy and abundant in parts of Australia.

Reference(s):

- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.
- Randall, R. Peter (2017). A Global Compendium of Weeds. Third Edition..

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

Answer / Justification:

Comparing georeference data from GBIF with the Climate Matching tool, this species is found predominately in areas with a similar climate to GA (GA zones 7-9, P. coccinea zones 6-9).

Reference(s):

- Missouri Botanical Garden (2017). Pyracantha coccinea - MBG.
- GBIF (2017). Pyracantha coccinea M. J. Roemer.
- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.

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:

"Wells et al. (1986) listed P. coccinea as a problem plant in southern Africa and stated that it replaces native vegetation and pasture (grass), contaminates seeds and blocks access" (Csurhes et al. 2011).

Reference(s):

- [Anonymous] .

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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:

Lack of evidence.

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

Answer / Justification:

This species thorns, so people should use caution when handling. However, it is not noted as being a health risk to humans or animals. Berries are typically eaten by birds and some mammals, but are only used an a ornamental by humans.

Reference(s):

- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.
- Missouri Botanical Garden (2017). Pyracantha coccinea - MBG.
- Brand, M. H. (2015). Pyracantha coccinea, Scarlet Firethorn - Plant Database - University of Connecticut.

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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:

"...Pyracantha can form dense thickets that compete with native vegetation and impede the movement of animals and people... Several species have histories as weeds in the United States, Argentina, New Zealand and South Africa" (Csurhes et al 2011).

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

Answer / Justification:

Though landscapers and nurseries mention that this species can propagate via cuttings, this is not a common natural occurrence.

Reference(s):

- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.
- Brand, M. H. (2015). Pyracantha coccinea, Scarlet Firethorn - Plant Database - University of Connecticut.

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

Answer / Justification:

This is not a common method of reproduction for this species. "Pyracantha species generally reproduce from seeds" (Csurhes et al 2011).

Reference(s):

- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.

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

Answer / Justification:

lack of information.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

The viability of seed for this species is not referenced, but this species does produce greater than 1000 seeds each year: "Berries are produced in large numbers with up to 1000 seeds/m2 of soil surface recorded (PIER 2007)." (Csurhes et al 2011).

Reference(s):

- [Anonymous] .

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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 / Justification:

lack of information.

Reference(s):

- [Anonymous] .

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

Answer / Justification:

This species produces ripe fruit by late autumn and may persist through the winter. However, the bloom time is only 1-2 months long, and some references state that this species' fruiting only persists for "a short while" into the winter (Plant Database of UCONN).

Reference(s):

- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.
- Missouri Botanical Garden (2017). Pyracantha coccinea - MBG.
- Brand, M. H. (2015). Pyracantha coccinea, Scarlet Firethorn - Plant Database - University of Connecticut.

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

Answer / Justification:

Pyracantha coccinea typically disperses its seeds by birds, and sometimes even mammals. In an excerpt from Csurhes et al (2011) describing Pyracantha: "Birds are probably the most important dispersal vector. In New South Wales, pied currawongs are a major dispersal vector and actually prefer the fruit to those of other plant species. Bird dispersal assists escape of cultivated specimens from gardens to bushland (Bass 1996). Foxes have been suggested as a dispersal vector (Muyt 2001). In Southern California, the coyote (Canis latrans) disperses seeds of Pyracantha species (Silverstein 2005)".

Reference(s):

- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.

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

Answer / Justification:

Csurhes et al 2011 mentions that Pyracantha can disperse its fruit or seeds via water, but this is not the most frequent method of dispersal.

Reference(s):

- Csurhes, S., Weber J., & Zhou D. Yuchan (2011). IPA-Firethorn-Risk-Assessment.

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

Answer / Justification:

There is no evidence that this is a frequent method of propagule dispersal.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 12 -- Accept (low risk of invasiveness)
Confidence: 58 / 100
Questions answered: 17 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:

This evaluation does not have any reviewers.

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.