Acer platanoides 'Crimson King' -- Illinois

2017 Farm Bill PRE Project

PRE Score: 12 -- Accept (low risk of invasiveness)
Confidence: 70 / 100
Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Completed

Evaluation Date: October 10, 2017

This PDF was created on June 15, 2018
Plant Evaluated

*Acer platanoides 'Crimson King'*

Image by David J. Stang
Evaluation Overview

A PRE™ screener conducted a literature review for this plant (Acer platanoides 'Crimson King') 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

Acer platanoides is invasive in similar climates across the Midwest and Northeastern United States with detrimental effects on native plant communities. Though the species is naturalized in Illinois and listed as invasive, it has not yet developed into a major threat. Many cultivars are popular in the landscape trade, including 'Crimson King.' More research is needed on seed production, viability, and germination of cultivars to more clearly understand their risk of invasiveness.

General Information

Status: Completed
Screener: Emily Russell
Evaluation Date: October 10, 2017

Plant Information

Plant: Acer platanoides 'Crimson King'

If the plant is a cultivar, how does its behavior differs from its parent's?
'Crimson King' differs from the species in the color of its leaves and fruits, which are maroon. It is more compact than the species and tends to grow more slowly. This cultivar appears to produce less viable seed than the species, but offspring are not true to type. 'Crimson King' is often produced by grafting onto species rootstock, which can resprout after damage.

Regional Information

Region Name: Illinois
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 Medium confidence in this answer based on the available literature.

   Answer / Justification:

   Acer platanoides is naturalized in the Midwest, Mid-Atlantic, Northeast, and Northwest United States. It is unknown if or how much 'Crimson King' has contributed to these populations, though it has been popular in cultivation for decades and produces at least some viable seed. Confidence for this answer is medium since we are relying on data for the species.

   Reference(s):


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:

   Acer platanoides is naturalized in Illinois, as well as the Midwest, Mid-Atlantic, and Northeast United States where there is climate overlap with Illinois.
Reference(s):


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:**

Acer platanoides is invasive in the Midwest, Mid-Atlantic and Northeast United States. All cultivars including 'Crimson King' are prohibited in Maine, Massachusetts, Vermont, and New Hampshire.

**Reference(s):**

- Maine Department of Agriculture, Conservation and Forestry (2017). CRITERIA FOR LISTING INVASIVE TERRESTRIAL PLANTS.
- Massachusetts Department of Agricultural Resources (2009). Massachusetts Prohibited Plant List.

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:

Acer platanoides is listed as invasive Illinois, as well as the Midwest, Mid-Atlantic and Northeast United States. All cultivars including 'Crimson King' are prohibited in Maine and Vermont, where there is some climate overlap with Illinois.

Reference(s):

- Maine Department of Agriculture, Conservation and Forestry (2017). CRITERIA FOR LISTING INVASIVE TERRESTRIAL PLANTS.

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

Answer / Justification:

Acer tataricum ssp. ginnala is invasive in the Midwest.

Reference(s):


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 screener has a Very High confidence in this answer based on the available literature.
Answer / Justification:

Acer platanoides 'Crimson King' will grow in many climates.

Reference(s):


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

Answer / Justification:

Acer platanoides 'Crimson King' casts deep shade that inhibits growth of other plants, even turfgrass. "The thick canopy of leaves and shallow roots severely limits what can be grown within the drip line of the tree." (MOBOT) The species displaces both understory and canopy species in forests where it has established, causing changes in diversity, species composition and community structure.

Reference(s):

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:

Acer platanoides is especially competitive in cool, moist, shaded forests that rarely burn. "It is likely that Norway maple increases in the absence of fire."

Reference(s):


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:

There is no evidence of health risks to humans or animals.

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 screener has a Medium confidence in this answer based on the available literature.
Answer / Justification:

There is no evidence of impenetrable thickets.

Reference(s):

- [Anonymous].

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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:

A. platanoides will resprout after cutting, but there is no evidence that it will spread to new areas vegetatively. 'Crimson King' is often grafted onto species rootstock, which may sprout vigorously after cutting. (ArboristSite.com) "USDA Natural Resources Conservation Service Plants Database indicates that at least one cultivar of Norway maple (Crimson King) has the ability to 'resprout,' but none have 'coppice potential.'" (FEIS) For the species: "Spreads to new areas by vegetative reproduction and seed" (NPS) but there are no descriptions or documentation of vegetative reproduction available.

Reference(s):


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:

There is no evidence of reproducing from fragments in the wild.

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

Answer / Justification:

Seed is the primary means of reproduction for Acer platanoides. More research is needed on seed production, viability, and germination for 'Crimson King,' but it appears that this cultivar produces viable seed in smaller quantities than the species.

Reference(s):


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

Answer / Justification:

Acer platanoides produces copious viable seeds. Pennsylvania studies by Conklin and Selmer found that 'Crimson King' produced an average of 229 seeds each year with only 3-10% viability. One homeowner reported about 400 seedlings beneath a mature 'Crimson King.'
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:

Conflicting information in the literature makes it impossible to answer this question with confidence. Seeds of 'Crimson King' did not germinate over a three-year study in Pennsylvania, in either a growth chamber or on the forest floor. However, the species did not germinate in the growth chamber either and had very low germination on the forest floor, though seed viability was determined to be 75%. The authors (Conklin and Sellmer) offer several possible explanations, including a possible fungal pathogen and system failure in the growth chambers. Other sources report that Acer platanoides generally germinates in spring after 90-120 days of cold stratification at higher percentages (USDA FS, Dirr). One homeowner reported about 400 seedlings beneath a mature 'Crimson King.' More studies are needed to confirm germination rates of 'Crimson King.'

Reference(s):

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

Answer / Justification:

Acer platanoides does not have a short juvenile period.

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

Answer / Justification:

Acer platanoides 'Crimson King' flowers once in the spring for a period of weeks.

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: 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:

   Birds and small mammals eat the seeds but there are not reports of long distance dispersal.

   Reference(s):

   - [Anonymous].

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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 Medium confidence in this answer based on the available literature.

   Answer / Justification:

   Samaras are dispersed by wind, but are unlikely to travel long distances. "Estimated lateral distance traveled by samaras in a 6.2 miles/hour (10 km/hr) breeze when dropped from a height of "approximately 3/4 of the maximum height of the species" was 165 feet (50.3 m)"

   Reference(s):

20. Are the plant’s propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

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

Answer / Justification:

"Roads and trails provided important corridors for propagule movement away from developed areas over the course of the invasion. They also appeared to facilitate longer distance dispersals than would be expected given the biology of the species."

Reference(s):


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**Total PRE Score**

**PRE Score:** 12 -- Accept (low risk of invasiveness)

**Confidence:** 70 / 100

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

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**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)

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**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:

- Steve Worth  
  December 22, 2017
- Jeff Mengler  
  December 20, 2017
- Michael Yanny  
  December 6, 2017
- Linda Mackechnie  
  November 12, 2017
- Kim Shearer  
  October 17, 2017

This evaluation has a total of 5 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 # 6200

Date Created: December 21, 2017 - 2:09pm  
Date Updated: January 29, 2018 - 1:18pm

Submitted by: Steve Worth

Status: Fixed  
Type: Comment  
Severity: Minor  
Scope: Regional Information

Issue Description

Please see my comments on the Royal Red Maple. Royal Red is simply an improved Crimson King, and my comments apply to this cultivar as well.

Issue Resolution (Screener's Response to Issue)

I incorporated your comments into the answer text and also the Evaluation Summary.

Issue ID # 6174

Date Created: December 20, 2017 - 7:54am  
Date Updated: January 29, 2018 - 2:13pm

Submitted by: Jeff Mengler

Status: Fixed  
Type: Suggestion
Severity: Minor
Scope: Q19. Are the plant’s propagules frequently dispersed long distance (>100 m) by wind or water?

Issue Description

The information provided on wind dispersal of Acer samaras is not consistent between Acer tartarica ginnala and Acer plantanoides Crimson King - though neither are relying on information specific to the cultivar being evaluated. Each reviewer found and relied on different reports for related Acer.

Issue Resolution (Screener's Response to Issue)

Is it possible that samaras from different Acer species can travel different distances?

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Issue ID # 6173

**Date Created:** December 20, 2017 - 7:51am  
**Date Updated:** January 29, 2018 - 1:05pm

Submitted by: Jeff Mengler

**Status:** Fixed  
**Type:** Comment  
**Severity:** Major  
**Scope:** Plant Information

**Issue Description**

Much of the evaluation of Acer plantanoides "Crimson King" relies soley on information for the species, not the cultivar though the evaluation does indicate more research is needed on Crimson King. This may overstate the invasive potential given differences in seed production etc.

**Issue Resolution (Screener's Response to Issue)**

Thank you for your comment.
Issue ID # 5442

Date Created: October 17, 2017 - 5:19pm  
Date Updated: December 10, 2017 - 6:28pm

Submitted by: Kim Shearer

Status: Fixed  
Type: Suggestion  
Severity: Major  
Scope: Q15. 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?

Issue Description

Please see Janine Conklin's 2009 pub at this link and revise the statement in response to this question.

Issue Resolution (Screener's Response to Issue)

The 2009 Germination study by Conklin and Sellmer was already included in the answer justification and citation. This study conflicts with information from the USDA and Dirr on germination of the species, and therefore, a clear answer to this question is still lacking. Conklin also noted that germination may have been low in the study due to fungal pathogens and a system failure in the growth chambers. I added a sentence to the answer justification that hopefully better summarizes the results of the Conklin study and clarifies the need for further research.

Issue ID # 5441

Date Created: October 17, 2017 - 5:14pm  
Date Updated: December 10, 2017 - 5:58pm

Submitted by: Kim Shearer

Status: Fixed  
Type: Suggestion  
Severity: Major  
Scope: Q13. Does the species (or cultivar or variety) commonly produce viable seed?

Issue Description
Since this question is regarding seed viability, I recommend referencing Janine Conklin's paper *Germination and Seed Viability of Norway Maple Cultivars, Hybrids, and Species* (also published in 2009 in HortTech) in addition to her other paper that is referenced relative to seed production.

**Issue Resolution (Screener's Response to Issue)**

That paper is already included in the citations.

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**Issue ID # 5440**

**Date Created:** October 17, 2017 - 4:55pm  
**Date Updated:** January 29, 2018 - 11:12am

**Submitted by:** Kim Shearer

**Status:** Fixed  
**Type:** Suggestion  
**Severity:** Major  
**Scope:** Q11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

**Issue Description**

Resprouting from stumps is not spreading into new areas vegetatively. If the species or cultivar sprouts from the roots away from the stump, then that would definitely be spreading into new areas vegetatively. I would recommend removing the comments regarding resprouting relative to vegetative spread and reproduction. As for the NPS quote about spreading vegetatively, if that is the case then there should be another reference that supports this. Doing a quick search, I was not able to find any propagation information relative to propagating Norway maple from root cuttings. This does not mean that information is not out there, but I did not find it. If the species can be propagated from root cuttings (not resprouting from a stump), then I would think spreading/reproducing vegetatively would be possible. An example of this happening is the Kentucky coffee tree which colonizes areas through root sprouts and can produce plantlets from remaining roots after stump removal. Again, I have not witnessed this in Norway maple, but that does not mean it doesn't happen. Perhaps someone from the nursery industry who has dug field planted Norway maples will provide greater insight into this.

**Issue Resolution (Screener's Response to Issue)**

Clarified intention of the question with PlantRight and corrected answer to "no": this tree will resprout...
from a cut stump, but not spread to new areas vegetatively.

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**Issue ID # 5439**

**Date Created:** October 17, 2017 - 1:43pm  
**Date Updated:** December 10, 2017 - 6:49pm  

**Submitted by:** Kim Shearer  

**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**

"Acer platanoides is invasive in the Midwest, Mid-Atlantic and Northeast United States. All cultivars including 'Crimson King' are prohibited in Maine, Massachusetts, Connecticut, Vermont, and New Hampshire."

Need a reference for prohibition in Connecticut.

**Issue Resolution (Screener's Response to Issue)**

Removed Connecticut.
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.