



***Plant Risk Evaluator -- PRE<sup>TM</sup>  
Evaluation Report***

***Acer platanoides 'Royal Red' -- Illinois***

***2017 Farm Bill PRE Project***

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

**Confidence:** 65 / 100

**Questions answered:** 18 of 20 -- Valid (80% or more questions answered)

**Privacy:** Public

**Status:** Submitted

**Evaluation Date:** October 13, 2017

*This PDF was created on June 15, 2018*



**Plant Evaluated**

*Acer platanoides 'Royal Red'*



Image by K. Zuzek



## Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Acer platanoides* 'Royal Red') 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 'Royal Red.' More research is needed on seed production, viability, and germination of cultivars to more clearly understand their risk of invasiveness. There was not much information in the literature for 'Royal Red', so the screening closely follows the evaluation for 'Crimson King.' 'Crimson King' was introduced earlier than 'Royal Red,' and the two names are sometimes used interchangeably in the nursery trade.

## General Information

**Status:** Submitted

**Screener:** Emily Russell

**Evaluation Date:** October 13, 2017

## Plant Information

**Plant:** *Acer platanoides* 'Royal Red'

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

'Royal Red' 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. 'Royal Red' is often produced by grafting onto species rootstock, which can resprout after damage. 'Royal Red' is said to have superior leaf color, cold hardiness and landscape performance compared to 'Crimson King.' Some sources say these two cultivars are the same plant and there are no detectable differences.



## 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 *screeners* 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 'Royal Red' has contributed to these populations. Confidence for this answer is medium since we are relying on data for the species.

#### Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
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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 **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):**

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
- 

**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 **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 'Royal Red' are prohibited in Maine, Massachusetts, Connecticut, Vermont, and New Hampshire.

**Reference(s):**

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
  - Swearingen, J., Slattery B., Reshetiloff K., & Zwicker S. (2010). Plant Invaders of Mid-Atlantic Natural Areas. 168.
  - Maine Department of Agriculture, Conservation and Forestry (2017). CRITERIA FOR LISTING INVASIVE TERRESTRIAL PLANTS.
  - NH Department of Agriculture, Markets & Food, Division of Plant Industry (2017). Fact Sheet: Prohibited Invasive Plant Species Rules, Agr 3800.
  - Massachusetts Department of Agricultural Resources (2009). Massachusetts Prohibited Plant List.
  - Vermont Agency of Agriculture, Food & Markets (2013). Quarantine # 3 - Noxious Weeds.
- 

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



**Answer / Justification:**

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

**Reference(s):**

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
  - Swearingen, J., Slattery B., Reshetiloff K., & Zwicker S. (2010). Plant Invaders of Mid-Atlantic Natural Areas. 168.
  - Maine Department of Agriculture, Conservation and Forestry (2017). CRITERIA FOR LISTING INVASIVE TERRESTRIAL PLANTS.
  - Vermont Agency of Agriculture, Food & Markets (2013). Quarantine # 3 - Noxious Weeds.
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**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:**

*Acer tataricum* ssp. *ginnala* is invasive in the Midwest.

**Reference(s):**

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
- 

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



**Answer / Justification:**

*Acer platanoides* 'Royal Red' will grow in many climates.

**Reference(s):**

- GBIF Secretariat (2016). GBIF Backbone Taxonomy: *Acer platanoides* L..
- 

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

**Answer / Justification:**

*Acer platanoides* 'Royal Red' casts deep shade that inhibits growth of other plants, even turfgrass. 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):**

- Reinhart, K. O., Greene E., & Callaway R. M. (2005). Effects of *Acer platanoides* Invasion on Understory Plant Communities and Tree Regeneration in the Northern Rocky Mountains. *Ecography*. 28, 573–582.
  - Wyckoff, P. H., & Webb S. L. (1996). Understory Influence of the Invasive Norway Maple (*Acer platanoides*). *Bulletin of the Torrey Botanical Club*. 123, 197–205.
- 

### 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 **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):**

- Munger, G. T. (2003). *Acer platanoides*. In: Fire Effects Information System.
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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 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 *screeener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

There are no reports of impenetrable thickets.

**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 *screeners* 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. 'Royal Red' is often grafted onto species rootstock, which may sprout vigorously after cutting. "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 is no description or documentation of vegetative reproduction available.

#### Reference(s):

- Munger, G. T. (2003). *Acer platanoides*. In: Fire Effects Information System.
  - Swearingen, J., Slattery B., Reshetiloff K., & Zwicker S. (2010). Plant Invaders of Mid-Atlantic Natural Areas. 168.
- 

### 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:

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

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

**Answer / Justification:**

'Royal Red' produces viable seed.

**Reference(s):**

- Conklin, J. R., & Sellmer J. C. (2009). Germination and Seed Viability of Norway Maple Cultivars, Hybrids, and Species. *HortTechnology*. 19, 120–126.
- 

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

**Answer / Justification:**

No estimates of seed quantity could be found.

**Reference(s):**

- [Anonymous] .
- 

**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:**

'Royal Red' had less than 10% germination in a growth chamber and no germination on the forest floor in the study below. However, the species did not germinate well in this study either, though seed viability was determined to be 75%, and the authors offer several possible explanations. Other sources report that *Acer platanoides* generally germinates in spring after 90-120 days of cold stratification at high percentages. More studies are needed to confirm germination rates of 'Royal Red.'

**Reference(s):**

- Conklin, J. R., & Sellmer J. C. (2009). Germination and Seed Viability of Norway Maple Cultivars, Hybrids, and Species. *HortTechnology*. 19, 120–126.
  - USDA Forest Service (2008). USDA FS Agriculture Handbook 727 - The Woody Plant Seed Manual.
  - Dirr, M. A. (1998). *Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses*.
- 

**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:**

No short juvenile period for this species or cultivar.

**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: **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:**

*Acer platanoides* 'Royal Red' flowers and sets seed once a year.

**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 *screeener* 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] .
- 

**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 **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):**

- Munger, G. T. (2003). *Acer platanoides*. In: Fire Effects Information System.
- 

**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** points to the total PRE score.
- The *screeners* 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):**

- Wangen, S. R., & Webster C. R. (2006). Potential for Multiple Lag Phases during Biotic Invasions: Reconstructing an Invasion of the Exotic Tree *Acer platanoides*. *Journal of Applied Ecology*. 43, 258–268.
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**Total PRE Score**

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

**Confidence:** 65 / 100

**Questions answered:** 18 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:

- Steve Worth December 22, 2017
- Michael Yanny December 6, 2017
- Kim Shearer November 13, 2017
- Linda Mackechnie November 12, 2017

This evaluation has a total of 4 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](mailto:PlantRight@suscon.org) if additional action is required to resolve open issues.

### Issue ID # 6199

**Date Created:** December 21, 2017 - 2:05pm

**Date Updated:** January 29, 2018 - 1:17pm

**Submitted by:** Steve Worth

**Status:** Fixed

**Type:** Comment

**Severity:** Major

**Scope:** Regional Information

### Issue Description

There is ample evidence that *acer platanoides* is invasive in certain parts of the country. The studies cited here were primarily conducted in the eastern U.S. I have not seen any studies, nor has any local tree expert been able to point to an area in Illinois where Norway Maples have demonstrated invasive qualities. I do not doubt that there are cases where this tree has naturalized to a small degree, but the PRE glossary defines invasive as "it must cause significant economic or environmental damage". That is clearly not the case using any objective standard. When tree planting decision makers base their decisions on information that is not relevant to their particular region, it can have real economic consequences. Norway Maples became unfairly stigmatized in the midwest at about the same time that EAB took hold. This effectively took two of the most popular varieties off of the market just when the recession hit. Norway maple is far from the perfect tree and one could argue that it is overplanted but I feel strongly that it does not belong on any invasive list for the midwest and in Illinois in particular.

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

Thank you for your comment. These are valid concerns. The fact remains that *Acer platanoides* is listed as invasive in Illinois, so I did not change the answer to that question. However, I incorporated your comments into answer text and also the Evaluation Summary.





## **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](mailto: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.