



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

***Broussonetia papyrifera -- Georgia***

***2017 Farm Bill PRE Project***

**PRE Score:** 16 -- Reject (high risk of invasiveness)

**Confidence:** 78 / 100

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

**Privacy:** Public

**Status:** Submitted

**Evaluation Date:** August 13, 2017

*This PDF was created on August 13, 2018*



## Plant Evaluated

*Broussonetia papyrifera*



Image by Didier Descouens



## Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Broussonetia papyrifera*) 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

*Broussonetia papyrifera* can spread via seed and vegetative suckers, coppicing and re-sprouting, and it is a very vigorous grower. It is reported as invasive in many states that are a climate match for Georgia, however the GAEPCC rank it as a category 3 plant. The outcome of this PRE is an indication of the invasive potential of Paper mulberry in Georgia, and therefore should not be considered for sale or propagation

## General Information

**Status:** Submitted

**Screener:** Kylie Bucalo

**Evaluation Date:** August 13, 2017

## Plant Information

**Plant:** *Broussonetia papyrifera*

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

#### Answer / Justification:

Native to Japan and Taiwan. Excerpt from Weed of the Week resource. "Paper-mulberry occurs in twenty eight states in the Northeast, Southeast, and Midwest, and is reported to be invasive in natural areas in the District of Columbia, Florida, Georgia, Louisiana, Maryland, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, and Virginia. It is also identified as an invasive weed in over a dozen countries around the world. "

#### Reference(s):

- USDA Forest Service (2005). Weed of the week\_bP.
- 

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



**Answer / Justification:**

Excerpt from Overholt (2004) "Broussonetia papyrifera, the paper mulberry, is an exotic invasive plant which can quickly colonize disturbed areas throughout Florida. Furthermore, its tremendous range shows its ability to thrive in various climates throughout the world". Florida is a climate match for the region of concern.

**Reference(s):**

- Overholt, W. (2004). Wildland Weeds: Paper Mulberry *Broussonetia papyrifera*.
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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 **Very High** confidence in this answer based on the available literature.

**Answer / Justification:**

Excerpt from Overholt (2004) "Amazingly, this plant which is native to Eastern Asia has become an invader on several continents and in over a dozen countries. The World Conservation union lists paper mulberry as one of the six worst plant invaders in Pakistan (IUCN Website). Recent studies have shown that it is also one of the top alien invasives in Pampa grasslands in Argentina, (Ghersa et. al. 2002).

**Reference(s):**

- Overholt, W. (2004). Wildland Weeds: Paper Mulberry *Broussonetia papyrifera*.
- 

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



**Answer / Justification:**

Excerpt from PCA reference "Paper-mulberry occurs in twenty eight states in the Northeast, Southeast, and Midwest, and is reported to be invasive in natural areas in the District of Columbia, Florida, Georgia, Louisiana, Maryland, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, and Virginia. " Many of these are matches for the region of concern. The GAEPPC ranks Paper mulberry as a category 3 plant which is described as "Exotic plant that is a minor problem in Georgia natural areas, or is not yet known to be a problem in Georgia but is known to be a problem in adjacent states."

**Reference(s):**

- NPS (0). PCA Alien Plant Working Group - Paper Mulberry (*Broussonetia papyrifera*).
  - Georgia Invasive Species Task Force (0). List of Non-native Invasive Plants in Georgia - Georgia Invasive Species Task Force- LIST.
- 

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

**Answer / Justification:**

There is no evidence of this in the Global Compendium of Weeds resource.

**Reference(s):**

- [Anonymous] .
- 

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

**Answer / Justification:**



CABI and GBIF resources show distributions in Asia, Africa, North America, Europe and Oceania. Occurrences in GBIFdatabase for North America are probably >50% match. Occurrences in Asia are < 50% match because of the domination of occurrences in Taiwan (its natural range) which is not a climate match for Georgia. Europe distribution is also

## 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:

Paper mulberry exhibits aggressive growth and quickly invades disturbed lands, competing with more desirable plant species.

#### Reference(s):

- [Anonymous] .
- 

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

#### Answer / Justification:

There was 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 **High** 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 *screeener* has a **Very High** confidence in this answer based on the available literature.

**Answer / Justification:**

There is no evidence of this.

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



**Answer / Justification:**

Paper Mulberry is a very vigorous grower, and can grow from coppicing and suckering.

**Reference(s):**

- CABI (0). *Broussonetia papyrifera* (paper mulberry)\_CABI.
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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: **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:**

"If felled and uprooted it can maintain its presence by means of numerous suckers which grow from any portions of root left in the ground (Troup, 1921)."

**Reference(s):**

- CABI (0). *Broussonetia papyrifera* (paper mulberry)\_CABI.
- 

**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.

**Reference(s):**

- USDA Forest Service (2005). Weed of the week\_bP.
- Overholt, W. (2004). Wildland Weeds: Paper Mulberry *Broussonetia papyrifera*.
- GBIF (0). *Broussonetia papyrifera* (L.) Vent.\_GBIF.
- CABI (0). *Broussonetia papyrifera* (paper mulberry)\_CABI.
- NPS (0). PCA Alien Plant Working Group - Paper Mulberry (*Broussonetia papyrifera*).



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

- 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:**

"Seeds are light and small, with about 540,000 seeds per kilogram."

**Reference(s):**

- CABI (0). *Broussonetia papyrifera* (paper mulberry)\_CABI.
- 

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

**Answer / Justification:**

"Seed dispersed by birds has been observed to germinate readily". "It regenerates freely from seed in moist places where there is not already heavy plant cover, and seedlings can become a problem around mature trees."

**Reference(s):**

- CABI (0). *Broussonetia papyrifera* (paper mulberry)\_CABI.
- 

**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

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

**Answer / Justification:**

None give duration of fruit persisting on the tree. References give only information that they "appear in summer"

**Reference(s):**

- USDA Forest Service (2005). Weed of the week\_bP.
  - Overholt, W. (2004). Wildland Weeds: Paper Mulberry *Broussonetia papyrifera*.
  - CABI (0). *Broussonetia papyrifera* (paper mulberry)\_CABI.
- 

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



**Answer / Justification:**

"The fruits of *B. papyrifera* are consumed by many types of birds and other small animals which are thought to disseminate the seeds. Water may also play a role of dispersal alongside water courses or irrigation channels." "The seeds are spread far and wide by wildlife who feed on the fruits. "

**Reference(s):**

- CABI (0). *Broussonetia papyrifera* (paper mulberry)\_CABI.
  - NPS (0). PCA Alien Plant Working Group - Paper Mulberry (*Broussonetia papyrifera*).
- 

**19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?**

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeners* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

Water may also play a role of dispersal alongside water courses or irrigation channels. CL set to medium because only one resource found this to be true.

**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:** 16 -- Reject (high risk of invasiveness)

**Confidence:** 78 / 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:

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](mailto: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](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.