



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

Pennisetum alopecuroides -- Texas

2017 Farm Bill PRE Project

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

Confidence: 62 / 100

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

Privacy: Public

Status: Submitted

Evaluation Date: September 29, 2017

This PDF was created on August 13, 2018



Plant Evaluated

Pennisetum alopecuroides



Image by André Karwath



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Pennisetum alopecuroides*) 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

Pennisetum alopecuroides is naturalized sporadically in the U.S. with naturalized plants in a single county in Texas. The species is listed as potentially invasive in the mid-Atlantic region but is not listed invasive in any states. Several cultivars are available, some of which are prolific seeders and others are reportedly sterile. Cultivar seeds do not grow true to type however, so all cultivars contribute to the spread of the parent species. More information is needed on seed production, germination, and spread.

General Information

Status: Submitted

Screener: Kim Taylor

Evaluation Date: September 29, 2017

Plant Information

Plant: *Pennisetum alopecuroides*

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

This evaluation is for the species, not a particular cultivar.

Regional Information

Region Name: Texas



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

Answer / Justification:

Kartesz indicates *Pennisetum alopecuroides* is naturalized in Colorado, Texas, Arkansas, Missouri, Illinois, Indiana, Michigan, Ohio, Pennsylvania, New York, Delaware, Virginia, and North Carolina. GRIN indicates it is also naturalized in Armenia, Azerbaijan, Georgia, and New Zealand and is adventive in the Czech Republic.

Reference(s):

- U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.8.2 *Pennisetum alopecuroides*.
- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).

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

Answer / Justification:

Kartesz indicates *Pennisetum alopecuroides* is naturalized in Colorado, Texas, Arkansas, Missouri, Illinois, Indiana, Michigan, Ohio, Pennsylvania, New York, Delaware, Virginia, and North Carolina.



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

Answer / Justification:

Listed by National Park Service Exotic Plant Management Team as a potential or emerging threat to natural areas in the mid-Atlantic region. EDD Maps does not list the species as invasive in any state. It is listed as invasive in New Zealand however.

Reference(s):

- Mastalerz, A., & Frey M. (2012). Invasive Plant Alert: Fountain Grass *Pennisetum alopecuroides* (L.) Spreng..
 - Invasive Plant Atlas of the United States (0). Chinese fountaingrass: *Pennisetum alopecuroides* (Cyperales: Poaceae): Invasive Plant Atlas of the United States.
 - Howell, C. J., & Terry J. A. (2016). The creation of a New Zealand weed atlas. Science for Conservation. Department of Conservation, Wellington, New Zealand. 21.
-

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:

While potentially invasive in the mid-Atlantic region, this area does not have a similar climate to Texas. It is listed as invasive in New Zealand, portions of which share a climate with Texas.



Reference(s):

- Mastalerz, A., & Frey M. (2012). Invasive Plant Alert: Fountain Grass *Pennisetum alopecuroides* (L.) Spreng..
 - Howell, C. J., & Terry J. A. (2016). The creation of a New Zealand weed atlas. Science for Conservation. Department of Conservation, Wellington, New Zealand. 21.
-

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

Answer / Justification:

32 species of *Pennisetum* are listed in the Global Compendium of Weeds including *P. villosum* which is invasive in Texas.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
 - Global Compendium of Weeds (0). Global Compendium of Weeds: species index.
-

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:

Less than half of the species range has a similar climate to Texas.



Reference(s):

- GBIF (0). *Pennisetum alopecuroides* (L.) Spreng. - gbif.
-

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

Answer / Justification:

Listed by National Park Service Exotic Plant Management Team as a potential or emerging threat to natural areas in the mid-Atlantic region but no mention of why. More information needed.

Reference(s):

- Mastalerz, A., & Frey M. (2012). Invasive Plant Alert: Fountain Grass *Pennisetum alopecuroides* (L.) Spreng..
-

8. Is the plant noted as promoting fire and/or changing fire regimes?

- 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:

Members of the genus are recognized as highly flammable with capability of promoting fire and changing fire regimes.



Reference(s):

- Fire Performance Plant Selector (2010). *Pennisetum* spp. — Fire Performance Plant Selector.
 - Victorian Resources Online, Agriculture Victoria (2017). Swamp foxtail grass (*Pennisetum alopecuroides*).
 - Blackmore, M., & Vitousek P. M. (2000). Cattle Grazing, Forest Loss, and Fuel Loading in a Dry Forest Ecosystem at Pu'u Wa'aWa'a Ranch, Hawai'i. *Biotropica*. 32, 625–632.
 - Brooks, M. L. (2008). Plant invasions and fire regimes.
-

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

Answer / Justification:

The species is not known to be toxic.

Reference(s):

- Plants For A Future (PFAF) (0). *Pennisetum alopecuroides* Chinese Fountain Grass, Fountain Grass, Swamp Foxtail Grass, Chinese Fountain Grass PFAF Plant Database.
-

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

Answer / Justification:

This is a tussock forming grass and does not form 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 *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

The species does not spread by rhizomes.

Reference(s):

- [Anonymous] .
-

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

Answer / Justification:

There is no evidence of this.

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

Answer / Justification:

"May be grown from seed and self-seeds in optimum growing conditions but cultivars do not come true from seed."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). *Pennisetum alopecuroides* - Plant Finder.
-

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

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

Answer / Justification:

P. alopecuroides 'Moudry' is reported as a prolific seed producer, producing more seed than the parent species. A Victoria, Australia impact assessment found: "High fruit/seed abundance (USDA 2006). A clump can display multiple inflorescences (Burnie et al 1998). Each seed head appears to have 10's – 100's of seeds (Koyama 1987) Therefore probably capable of producing 1000-2000 seeds potentially more." In a Florida evaluation, *P. alopecuroides* had 59-152 inflorescences.

Reference(s):

- Mastalerz, A., & Frey M. (2012). Invasive Plant Alert: Fountain Grass *Pennisetum alopecuroides* (L.) Spreng..
- Victorian Resources Online, Agriculture Victoria (2017). Swamp foxtail grass (*Pennisetum alopecuroides*).
- Wilson, S. B., & Knox G. W. (2009). Landscape Performance of Green Fountain Grass Alternatives Grown in Northern and Southern Florida. *HortTechnology*. 19, 471–476.
- Voigt, T. B., & Reicher Z. J. (2009). Selectively Controlling Escaped Fountain Grass in Cool-Season Turf. *ats*. 6,



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

Answer / Justification:

"Germination usually takes place within 3 weeks"

Reference(s):

- Plants For A Future (PFAF) (0). *Pennisetum alopecuroides* Chinese Fountain Grass, Fountain Grass, Swamp Foxtail Grass, Chinese Fountain Grass PFAF Plant Database.
-

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:

No information was found on age at reproductive maturity.

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



Answer / Justification:

"Bloom Time: July to February" " Fl. and fr. summer and autumn." " It is in flower from Aug to September."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). *Pennisetum alopecuroides* - Plant Finder.
 - Plants For A Future (PFAF) (0). *Pennisetum alopecuroides* Chinese Fountain Grass, Fountain Grass, Swamp Foxtail Grass, Chinese Fountain Grass PFAF Plant Database.
 - efloras.org (0). *Pennisetum alopecuroides* in Flora of China @ efloras.org.
-

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:

"Because of the long bristles on the spikelets, the grains of this grass may be dispersed in part by animals" (Hilty). "The seeds are dispersed in soft burr-like structures and are easily blown about by the wind. They may also float on water and readily become attached to livestock, other animals, clothing, machinery and other vehicles."

Reference(s):

- The State of Queensland Department of Agriculture and Fisheries (2016). *Cenchrus purpurascens* Factsheet from Environmental Weeds of Australia for Biosecurity Queensland Edition.
 - Hilty, J. (2016). Chinese Fountain Grass (*Pennisetum alopecuroides*).
-



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

Answer / Justification:

The seeds are dispersed in soft burr-like structures and are easily blown about by the wind. They may also float on water and readily become attached to livestock, other animals, clothing, machinery and other vehicles."

Reference(s):

- The State of Queensland Department of Agriculture and Fisheries (2016). *Cenchrus purpurascens* Factsheet from Environmental Weeds of Australia for Biosecurity Queensland Edition.
-

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

Answer / Justification:

"The wind generated by passing motor vehicles may blow the grain-bearing spikelets up and down roadways." (Hilty) "The seeds are dispersed in soft burr-like structures and are easily blown about by the wind. They may also float on water and readily become attached to livestock, other animals, clothing, machinery and other vehicles. Long distance dispersal can also occur in contaminated agricultural produce (e.g. pasture seeds, grain and wool)."

Reference(s):

- The State of Queensland Department of Agriculture and Fisheries (2016). *Cenchrus purpurascens* Factsheet from Environmental Weeds of Australia for Biosecurity Queensland Edition.
 - Hilty, J. (2016). Chinese Fountain Grass (*Pennisetum alopecuroides*).
-



Total PRE Score

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

Confidence: 62 / 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:

- Steve Moore

October 4, 2017

This evaluation has a total of 1 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.

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.