



***Plant Risk Evaluator -- PRETM
Evaluation Report***

Miscanthus sinensis 'Strictus' -- Minnesota

2017 Farm Bill PRE Project

PRE Score: 6 -- Accept (low risk of invasiveness)

Confidence: 71 / 100

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

Privacy: Public

Status: Submitted

Evaluation Date: September 22, 2017

This PDF was created on June 15, 2018



Plant Evaluated

Miscanthus sinensis 'Strictus'



Image by MBOT



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Miscanthus sinensis* 'Strictus') 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

Miscanthus 'Strictus' is a late-blooming cultivar, which means in Minnesota it is reproductively different from the parent species. Therefore, in this evaluation it will be considered largely on its own merits with less consideration of the earlier-blooming parent species. That said, the notion of bloom time should be considered with some caution given that factors such as climate change, mutation, and phenological adaptation could allow this cultivar to eventually produce viable seed in relatively cold climates. Given its late bloom time in Minnesota, *Miscanthus* 'Strictus' is a relatively safe cultivar for that region.

General Information

Status: Submitted

Screener: Mike Monterusso

Evaluation Date: September 22, 2017

Plant Information

Plant: *Miscanthus sinensis* 'Strictus'

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

Miscanthus 'Strictus' is a late-blooming, variegated cultivar.

Regional Information

Region Name: Minnesota



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: **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:

However, the parent species has naturalized in several US states.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Miscanthus sinensis* (Chinese silvergrass).
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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

The parent species, *Miscanthus sinensis*, has naturalized in the Upper Peninsula of Michigan.

Reference(s):

- United States Department of Agriculture (2017). Plants Profile for *Miscanthus sinensis* (Chinese silvergrass).



3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- 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:

The parent species is reported as invasive in CT, DC, GA, IL, IN, KY, MD, NC, NJ, PA, SC, TN, VA, and WI.

Reference(s):

- USDA Forest Service, Forest Health Staff (2006). Chinese silvergrass.doc - chinese-silvergrass.pdf.
-

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

Answer / Justification:

While *Miscanthus sinensis* is considered a "non-regulated terrestrial invasive species" in Wisconsin. However, given the late-blooming nature of *M. 'Strictus'*, it is considered on its own merit for this question.

Reference(s):

- Wisconsin Department of Natural Resources (2015). Invasive species - Wisconsin DNR, *miscanthus sinensis*.
 - USDA Forest Service, Forest Health Staff (2006). Chinese silvergrass.doc - chinese-silvergrass.pdf.
-



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

Answer / Justification:

The parent species is invasive in Wisconsin. Other cultivars could be considered invasive along with the parent species if they have early bloom time and are not sterile. *Miscanthus sacchariflorus* is also noted as being invasive in Minnesota.

Reference(s):

- Wisconsin Department of Natural Resources (2015). Invasive species - Wisconsin DNR, *Miscanthus sinensis*.
 - Schnitzler, A., & Essl F. (2015). From horticulture and biofuel to invasion: the spread of *Miscanthus* taxa in the USA and Europe. *Weed Research*. 55, 221–225.
 - Minnesota Department of Natural Resources (2017). Invasive Terrestrial Species - Amur Silver Grass.
-

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:

According to GBIF, most occurrences of *Miscanthus* are in Europe and SE Asia.

Reference(s):

- GBIF (2016). *Miscanthus sinensis* Andersson - GBIF Species.
-



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

Answer / Justification:

The parent species... "escapes from ornamental plantings and can form large clumps along disturbed areas, displacing native vegetation."

Reference(s):

- Swearingen, J., & Barger C. (2015). Chinese silvergrass: *Miscanthus sinensis* (Cyperales: Poaceae): Invasive Plant Atlas of the United States.
-

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

Answer / Justification:

The parent species... "is also extremely flammable and increases fire risks of invaded areas."

Reference(s):

- Swearingen, J., & Barger C. (2015). Chinese silvergrass: *Miscanthus sinensis* (Cyperales: Poaceae): Invasive Plant Atlas of the United States.
-



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:

No evidence found.

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

Answer / Justification:

No evidence found.

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:

"Chinese silvergrass regenerates by sprouting from the rhizomes and by tillering."

Reference(s):

- Waggy, M. A. (2011). *Miscanthus sinensis*. In: Fire Effects Information System.
-

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

Answer / Justification:

Reproduction via rhizomes is not considered the same as by fragmentation. Also, *Miscanthus sinensis* is a clump-forming perennial that reproduces primarily by seed.

Reference(s):

- Global Invasive Species Database (2011). GISD - *Miscanthus sinensis*.
-

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

Answer / Justification:

Although a late-blooming cultivar, *Miscanthus* 'Strictus' does have the potential to produce viable seed.



Reference(s):

- Madeja, G., Umek L., & Havens K. (2012). Differences in seed set and fill of cultivars of *Miscanthus* grown in USDA cold hardiness zone 5 and their potential for invasiveness. *Journal of Environmental Horticulture*. 30, 42.
-

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

- 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:

One study demonstrated that *M. 'Strictus'* produced 907 seeds/plant, although this does not necessarily speak to overall viability.

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?

Reference(s):

- [Anonymous] .
-



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: **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:

"...seed set and/or the production of more rhizomes occurs within the first growing season."

Reference(s):

- Victorian Resources Online, Agriculture Victoria (2017). Chinese Silvergrass (*Miscanthus sinensis*).
-

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

Answer / Justification:

Miscanthus sinensis flowers and sets seed once/year.

Reference(s):

- Waggy, M. A. (2011). *Miscanthus sinensis*. In: Fire Effects Information System.
-



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

Answer / Justification:

Miscanthus sinensis seeds are dispersed by wind.

Reference(s):

- Waggy, M. A. (2011). *Miscanthus sinensis*. In: Fire Effects Information System.
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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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

If seeds were produced, they are dispersed by wind but the average distance is likely 5-10 meters.

Reference(s):

- Waggy, M. A. (2011). *Miscanthus sinensis*. In: Fire Effects Information System.
 - Quinn, L. D., Matlaga D. P., J. Stewart R., & Davis A. S. (2011). Empirical Evidence of Long-Distance Dispersal in *Miscanthus sinensis* and *Miscanthus × giganteus*. *Invasive Plant Science and Management*. 4, 142–150.
-



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

Answer / Justification:

No evidence found.

Reference(s):

- [Anonymous] .
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Total PRE Score

PRE Score: 6 -- Accept (low risk of invasiveness)

Confidence: 71 / 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:

- Mary Hockenberry Meyer December 12, 2017
- Tom Buechel October 16, 2017

This evaluation has a total of 2 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 # 6139

Date Created: December 12, 2017 - 6:51pm

Date Updated: December 12, 2017 - 6:51pm

Submitted by: Mary Hockenberry Meyer

Status: Not Fixed

Type: Suggestion

Severity: Major

Scope: Q05. Are other species of the same genus invasive in a similar climate?

Issue Description

I am concerned that the Wisconsin invasive *Miscanthus* species is not *sinensis* but is *sacchariflorus*...see the herbarium specimen for *Miscanthus* that is in the WI herbarium linked in the references for *Miscanthus sinensis* *Strictus*, *Zebrinus* and *Grazielle*. I think *Miscanthus sacchariflorus* is what is invasive in WI....that is all I see here in MN. Mary Meyer

Issue Resolution

No resolution has been entered for this issue.

Issue ID # 6026

Date Created: November 30, 2017 - 8:39am

Date Updated: December 18, 2017 - 9:29am



Submitted by: Laura Van Riper

Status: Fixed

Type: Suggestion

Severity: Minor

Scope: Evaluation as a whole

Issue Description

Madeja et al. 2012 could be a good published reference to add.

[Differences in seed set and fill of cultivars of *Miscanthus* grown in USDA cold hardiness zone 5 and their potential for invasiveness](https://s3.amazonaws.com/academia.edu.documents/46987346/Differences_in_Seed_Set_and_Fill_of_Cult20160703-1992-ffxocq.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1512063443&Signature=a%2FSzKVofF7DIHr3YmgGseulU0KXM%3D&response-content-disposition=inline%3B%20filename%3DDifferences_in_Seed_Set_and_Fill_of_Cult.pdf)

G Madeja, L Umek, [K Havens](#) - Journal of Environmental Horticulture, **2012** - academia.edu

https://s3.amazonaws.com/academia.edu.documents/46987346/Differences_in_Seed_Set_and_Fill_of_Cult20160703-1992-ffxocq.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1512063443&Signature=a%2FSzKVofF7DIHr3YmgGseulU0KXM%3D&response-content-disposition=inline%3B%20filename%3DDifferences_in_Seed_Set_and_Fill_of_Cult.pdf

Issue Resolution (Screener's Response to Issue)

Issue resolved by PRE Data Manager -- source was already added to Q13. Updated source to reflect author names and title.

Issue ID # 5420

Date Created: October 16, 2017 - 8:30am

Date Updated: November 28, 2017 - 11:28am

Submitted by: Tom Buechel

Status: Fixed

Type: Suggestion

Severity: Major

Scope: Q04. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar



climate?

Issue Description

Not sure that the information (literature review) is valid. *Miscanthus* is not deemed invasive in WI by law but by preconceived notion. Should find multiple sources to deem a plant invasive. There is no "personal" observation anywhere in this evaluation either or specific areas other than the published document.

Issue Resolution (Screener's Response to Issue)

The Wisconsin DNR deems *Miscanthus sinensis* as a "non-regulated terrestrial invasive species". Legal status, while certainly supportive of an invasive label, is not required for a plant to be considered invasive. The screener agrees that additional references would further support a given score. In this case, at the time of the initial screening the PRE score is relatively low (4), indicating that 'Strictus' is not invasive in a Minnesota's climate.



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.