

Ornamental Grasses for Rain Gardens



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Rain Garden

Photo: <http://www3.spea.net/Resources/Reports/Articles/2005/9/Rain-Gardens-Strategic-poolies-for-stormwater-management>



Parking Lot

https://stormwater.pca.state.mn.us/index.php?title=University_of_Minnesota_Arbordum_-_runoff_model_and_rain_gardens



Downspout garden

<https://emswcd.org/in-your-yard/rain-gardens/>

Problem

- No scientific research on which to base recommendations
- Recommendations based merely on wetland status
- Doesn't acknowledge that rain garden plants may experience drought too

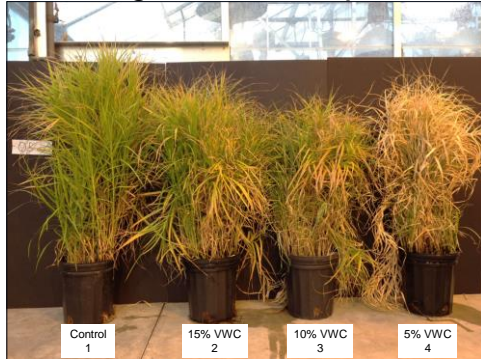
Scientific name	Common name	Wetland indicator status (Great Plains)
<i>Carex hystericina</i>	Porcupine sedge	Obligate wetland
<i>Carex muskingumensis</i>	Palm sedge	Obligate wetland
<i>Carex annectens</i>	Yellow fox sedge	Facultative wetland
<i>Carex grayi</i>	Gray's sedge	Facultative wetland
<i>Carex brevior</i>	Plains oval sedge	Facultative
<i>Carex sprengei</i>	Sprengel's sedge	Facultative Upland
<i>Carex pennsylvanica</i>	Pennsylvania sedge	Upland

*2-day flooding, 7-day flooding

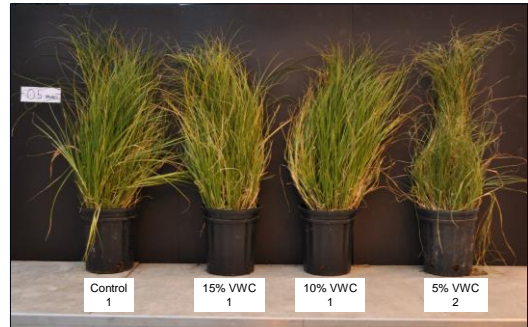
*Mild drought (15% VWC), moderate drought (10% VWC), and severe drought (5% VWC)

*several cycles

Palm sedge 2 day flood; obligate wetland plant



Plains oval sedge 2 day flood; facultative wetland plant



Ornamental grasses

Scientific name	Common name	Wetland indicator status (Great Plains)
<i>Deschampsia cespitosa</i> 'Pixie Fountain'	Tufted hair grass	Facultative wetland
<i>Panicum virgatum</i> 'Northwind'	Switch grass	Facultative
<i>Andropogon gerardi</i> 'Red October'	Big bluestem	Facultative upland
<i>Miscanthus sinensis</i> 'Purpurascens'	Chinese silvergrass	Facultative upland
<i>Schizachyrium scoparium</i> 'Blue Heaven'	Little bluestem	Facultative upland
<i>Bouteloua gracilis</i> 'Blonde Ambition'	Blue grama grass	Upland
<i>Calamagrostis x acutiflora</i> 'Karl Foerster'	Feather reed grass	Upland

Wetland indicator status, designation, and description are from Lichvar et al., 2016.

Grasses used in study

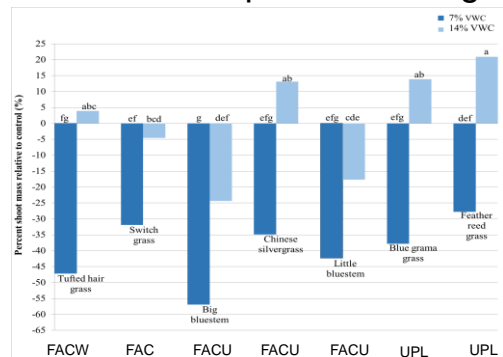


Photos by Esther E. McGinnis unless noted otherwise.

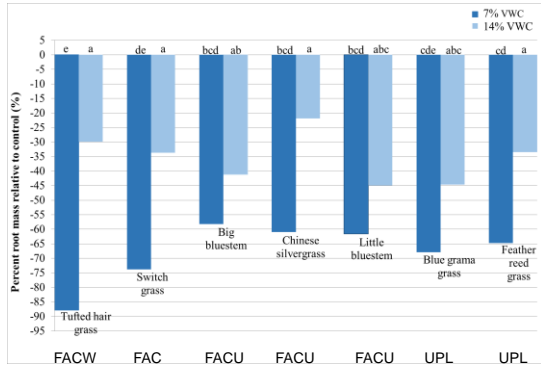
Design

- 7 grass species
- 2 flood durations; 2- and 7-day
- 2 drought setpoints 14% (mild) and 7% (severe) volumetric water content (VWC)
- Well-watered control
- At least four cycles

Shoot mass – species x drought



Root mass – species x drought



Chinese silver grass 'Purpurascens'

14% VWC

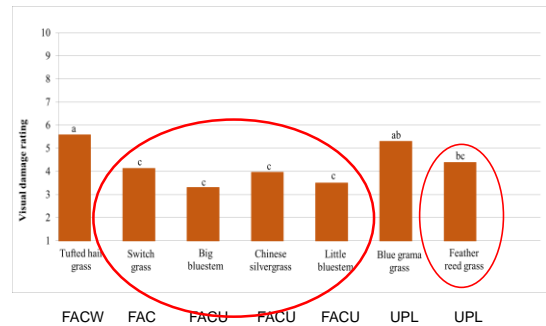


Chinese silver grass 'Purpurascens'

7% VWC



Visual damage rating - species



Miscanthus 'Purpurascens' Purple Flame Grass

- Red flame grass
- **Warm season grass**
- Zone 3; hardiest of the *Miscanthus* spp.
- Reliable fall color
- Small rhizomes will expand the width of the plant



Andropogon gerardii 'Red October' Big bluestem



- Zone 4
- 4-6' tall
- Warm season grass
- Spectacular fall color
- Clump former
- Will self seed

Schizachyrium scoparium 'Blue Heaven'
Little bluestem



- *Doesn't lodge
- *May not be hardy in northern areas
- *Fall color!

Panicum virgatum 'Northwind'



Zone 3; 4-5', PPA 2014

Calamagrostis x acutiflora
'Karl Foerster'

- Clump, 4-5 feet tall
- Cool season grass
- PPA 2002
- Hardy to Zone 3
- Can take more flooding than we expected



Bonus plant: *Bouteloua gracilis*
'Blonde Ambition'

- Less tolerant of cyclical flooding and drought than other grasses
- Great for saline soils!



Photo courtesy of Walters Gardens, Inc.

'Blonde Ambition'



Photo courtesy of Walters Gardens, Inc.

Conclusion

- Highly adaptable to cyclical flooding and drought
- Severe drought reduced relative plant height, shoot count, total biomass and ornamental value
- May need supplemental irrigation during times of drought
- More results to come: submersion study, salt tolerance study, petroleum tolerance study

Acknowledgment

- ND Specialty Crop Block Grant
- Please take our survey!