Germination characteristics of Four Potentially Invasive Grass Species

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Mid-South States: AL, AR, LA, MS, TN.

Invasive species locations and other information (NAWMA). >3000 completed.

Shared NBII database via portals.

Assist ED/RR and Risk Assessment efforts.
Invasive Plant Species Mapping
Surveys Conducted in 2006

Survey States
- IPAMS_core_states
- Surveys_06
- States
Species Highlight

- *Cayratia japonica* (bushkiller)
- *Marsilea mutica* (nardoo)
- *Oxycaryum cubensis* (Cuban bulrush)
- *Vitex rotundifolia* (beach vitex)
- *Miscanthus sinensis* (maidengrass)
Introduction

1. Large family (Poaceae) of similar plants.
   - 785 genera, ~10,000 species.

2. 18% of introduced vascular plants in MS are grasses. 30% of grasses are introduced.
   - 11% of grasses in the Manual of the Grasses of the United States are introduced (156 species).
3. Often have characteristics that are conducive to invasion.
   - Obscure, wind dispersed, prolific.

4. Introduced accidentally or for various purposes. Continue to be introduced as ornamentals.
   - Wolfe and Zajicek (1998) found 90% of people surveyed felt grasses have landscape (ornamental) value.
Ornamental Grasses

Ornamental grass examples:

- Red Barron bloodgrass (*Imperata cylindrica*)
- Giant Reeds (*Arundo donax*)
- Fountain grasses (*Pennisetum spp.*)
- Pampas grass (*Cortaderia selloana & C. jubata*)
- Maidengrasses (*Miscanthus spp.*)
Introduction
Introduction

Species:

- *Miscanthus floridulus* (Labill.) Warb.
- *Miscanthus sinensis* Anderss. CVs
- *Saccharum arundinaceum* Retz.
- *Saccharum ravennae* (L.) L.
Introduction

- Miscanthus floridulus
- Maidengrass
- 2.5 m (8 ft.) ht.
- E. Asia
- Zone 6
- Veg./perennial

Photo by Lara Maddox.
Introduction

- **Miscanthus sinensis**
- Maidengrass
- 4 m (13 ft.) ht.
- E. Asia
- Zone 6 (4a)
- ~5 bot. var.
- ~25 Cultivars
- Veg./perennial

Photo by Lara Maddox.
Introduction

- **Saccharum arundinaceum**
- Hardy sugarcane
- 3.6 m (12 ft.) ht.
- India, Malaysia
- Zone 6
- Veg./perennial

Photo by Lara Maddox.
Introduction

- *Saccharum ravennae*
  - Ravenne
  - or hardy pampas grass
  - 4 m (13 ft.) ht.
  - N. Africa
  - Zone 7
  - Veg./perennial

Photo by Lara Maddox.
Introduction: Study Objectives

- Determine which species and/or cultivars pose a risk of invasion.
- Suitable temperature range for germination.
- Does *Miscanthus sinensis* pose a greater risk if outcrossed?
Materials and Methods

Species:

- Miscanthus floridulus (Labill.) Warb.
- Miscanthus sinensis Anderss. CVs
- Saccharum arundinaceum Retz.
- Saccharum ravennae (L.) L.
Miscanthus sinensis
varieties and cultivars

- Arabescue
- *gracillimus* Hitchc.
- Graziella
- Kirk’s Dwarf
- Little Kitten
- Morning Light
- Purpurescens
- Sarabande
- Strictus
- variegatus Beal
- zebrinus Beal
Materials and Methods: Germination study

- Fall collected seeds from field plants
- 100 seeds of each (two replications) placed in a curtain germinator under continuous lighting and at:
  - 12°C (54°F)
  - 18°C (64°F)
  - 24°C (75°F)
  - 30°C (86°F)
  - 36°C (97°F)
Curtain Germinator
Results and Discussion

- **Species and/or cultivars which pose a risk of invasion (2006).**
  - Miscanthus sinensis ‘Purpurescens’
  - Miscanthus sinensis ‘Strictus’
  - Miscanthus sinensis variegatus
  - Saccharum ravennae

- **Suitable temperatures for germ.**
  - 24°C (75°F)
  - 30°C (86°F)
  - 36°C (97°F)
2006 Germination Study Results

Temperature (°C)

Percent Germination

M.s. gracillimus
M.s. Kirk's Dwarf
M.s. Graziella
M.s. variegatus
M.s. Sarabande
M.s. Purpurescens
M.s. Morning Light
M.s. Strictus
M.s. zebrinus
M.s. Little Kitten
M.s. Arabesque
M. floridulus
S. arundinaceum
S. ravannae

2006 Germination Study Results
Future Research

- Repeat germ. study (2006-07).
- Isolate *Miscanthus sinensis* varieties with viable seed and retest germination to determine if outcrossing is a problem.
- Continue monitoring and mapping efforts.
Any Questions

Erianthus

Miscanthus

floridulus

sinensis

Saccharum