

Australia/New Zealand Weed Risk Assessment adapted for Florida.

Data used for analysis published in: Gordon, D.R., D.A. Onderdonk, A.M. Fox, R.K. Stocker, and C. Gantz. 2008. Predicting Invasive Plants in Florida using the Australian Weed Risk Assessment. Invasive Plant Science and Management 1: 178-195.

<i>Miscanthus sinensis (Chinese silver grass)</i>			
Question number	Question	Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)		
2.04	Native or naturalized in habitats with periodic inundation		
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	0
3.02	Garden/amenity/disturbance weed	y	0
3.03	Weed of agriculture	y	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	0
4.01	Produces spines, thorns or burrs	y	1
4.02	Allelopathic	y	1
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	n	-1
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems	y	1
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.1	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0

5.01	Aquatic	n	0
5.02	Grass	y	1
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat		
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	?	
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative fragmentation	y	1
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed	n	-1
7.07	Propagules dispersed by other animals (externally)		
7.08	Propagules dispersed by other animals (internally)	n	-1
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05	Effective natural enemies present in Florida, or east of the continental divide		
Total Score			14

Outcome	Reject*
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*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

section	# questions answered	satisfy minimum?
A	6	yes
B	11	yes
C	15	yes
total	32	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01	Darke (1999) <i>The Color Encyclopedia of Ornamental Grasses: Sedges, Rushes, Restios, Cat-tails, and Selected Bamboos</i> . Timber Press, Portland, OR.	"Ironically, the invasive potential of <i>Miscanthus</i> has been enhanced by horticultural development...Many modern cultivars...were developed and selected for their ability to flower in short seasons."
1.02		
1.03		
2.01	Morisawa (1999) <i>Weed notes: Miscanthus sinensis</i> . The Nature Conservancy, Wildland Invasive Species Team.	"Plants tolerate cold climates but do not grow well in hot, humid southern climates."
2.02		
2.03		
2.04		
2.05	1. Randall and Marinelli, eds. (1996) <i>Weeds of the Global Garden</i> . Brooklyn Botanical Garden. 2. Jorgensen, Mortensen, Kjeldsen, and Schwarz (2003) Establishment, development and yield quality of fifteen <i>Miscanthus</i> genotypes over three years in Denmark. <i>Acta Agriculturae Scandinavica: Section B, Soil and Plant Science</i> 53: 190-199.	1. "Chinese silver grass...has become a popular ornamental grass in recent years." 2. <i>M. sinensis</i> is being tested as a potential biomass crop in Europe.
3.01	1. Randall and Marinelli, eds. (1996) <i>Weeds of the Global Garden</i> . Brooklyn Botanical Garden. 2. New Zealand Plant Conservation Network (2005) <i>New Zealand Adventive Vascular Plant List</i> .	1. "It has spread to disturbed sites along roadsides, woodland borders and clearings within wooded areas. It is found in pockets throughout the eastern U.S. from Florida to Texas, north to Massachusetts and New York." 2. Fully naturalized in New Zealand.
3.02	1. Randall and Marinelli, eds. (1996) <i>Weeds of the Global Garden</i> . Brooklyn Botanical Garden. 2. Miller. <i>Nonnative Invasive Plants of Southern Forests: a Field Guide for Identification and Control</i> . Gen. Tech. Rep. SRS-62. (http://www.invasive.org/weeds/usfsr8/).	1. "Once Chinese silver grass escapes, it tends to remain in the new site or slowly spread into highly disturbed areas, such as along roadsides." 2. "escaped to roadsides, forest margins, and into adjacent disturbed sites, forms extensive infestations"
3.03	Holm (1979) <i>A Geographical Atlas of World Weeds</i> .	Considered a common weed of

	John Wiley and Sons.	agriculture in Japan and Taiwan.
3.04		no evidence
3.05	Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	<i>M. japonicus</i> considered a serious weed in western Polynesia.
4.01	Darke (1999) The Color Encyclopedia of Ornamental Grasses: Sedges, Rushes, Restios, Cat-tails, and Selected Bamboos. Timber Press, Portland, OR.	"Be cautious of the often sharp-edged leaves, especially common to <i>M. sinensis</i> , which can cause minor but irritating cuts to hands and face."
4.02	1. Uraguchi, Watanabe, Kuno, Hoshino, and Fujii (2003) Allelopathy of floodplain vegetation species in the middlecourse of Tama River. Journal of Weed Science and Technology 48: 117-129. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	1. <i>M. sinensis</i> exhibited strong allelopathic activity. BUT 2. not allelopathic
4.03	Randall and Marinelli, eds. (1996) Weeds of the Global Garden. Brooklyn Botanical Garden.	no description of this
4.04	Ogura and Sugawara (2004) Grazing use of native pastures by beef cattle in Japan: recent researches on plant-animal interactions in native pastures. Tohoku Journal of Agricultural Research 55: 39-43.	<i>M. sinensis</i> is a preferred species by cattle grazing in native pastures in Japan.
4.05	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Ogura and Sugawara (2004) Grazing use of native pastures by beef cattle in Japan: recent researches on plant-animal interactions in native pastures. Tohoku Journal of Agricultural Research 55: 39-43.	1. no toxicity 2. grazed by cattle in Japan
4.06		
4.07	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	no toxicity; no mention of allergies or toxicity in horticultural or toxicity references
4.08	Southeast Exotic Pest Council (http://www.invasive.org/eastern/eppc/MISI.html).	"Miscanthus is being considered as a wildland fire hazard due to its large amount of dried biomass in the fall and winter. Burning plants can have flame lengths of thirty feet and have a high potential for spotting into receptive fuels."
4.09	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Darke (1999) The Color Encyclopedia of Ornamental Grasses: Sedges, Rushes, Restios, Cat-tails, and Selected Bamboos. Timber Press, Portland, OR.	1. shade intolerant 2. "All species [of <i>Miscanthus</i>] and most cultivars prefer full sun sites; however, there are selections with limited shade tolerance."

4.1	1. Hortocopia 4.0 2. Darke (1999) The Color Encyclopedia of Ornamental Grasses: Sedges, Rushes, Restios, Cat-tails, and Selected Bamboos. Timber Press, Portland, OR.	1. Suitable soil is well-drained/loamy, sandy or clay. 2. "They [genus <i>Miscanthus</i>] grow well on most soils, from loose sands to heavy clays."
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	graminoid
4.12		no evidence
5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Poaceae
5.03	1. Minamisawa, Nishioka, Miyaki, Ye, Miyamoto, You, Saito, Saito, Barraquio, Teaumroong, Sein, and Sato (2004) Anaerobic nitrogen-fixing consortia consisting of clostridia isolated from gramineous plants. Applied and Environmental Microbiology 70: 3096-3102. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	1. "...we detected substantial numbers of nitrogen-fixing bacteria...in situ for the pioneer plant <i>Miscanthus sinensis</i> ..." BUT 2. does not fix nitrogen [and is herbaceous]
5.04	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	not propagated by bulbs, corms, or tubers
6.01		
6.02	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Meyer and Tchida (1999) <i>Miscanthus Anderss.</i> produces viable seed in four USDA hardiness zones. Journal of Environmental Horticulture 17: 137-140.	1. propagated by seed 2. Several cultivars of <i>M. sinensis</i> were found to set viable seed.
6.03	Darke (1999) The Color Encyclopedia of Ornamental Grasses: Sedges, Rushes, Restios, Cat-tails, and Selected Bamboos. Timber Press, Portland, OR.	possibly hybridizes with <i>M. oligostachyus</i> , but unclear whether this occurs in the wild or not
6.04		
6.05		most grasses wind pollinated
6.06	Morisawa (1999) Weed notes: <i>Miscanthus sinensis</i> . The Nature Conservancy, Wildland Invasive Species Team.	" <i>M. sinensis</i> has a branched, subterranean rhizome system. It spreads rhizomatously, and pieces of rhizome 4 cm long can be used to propagate the plant."
6.07		

7.01		
7.02	1. Randall and Marinelli, eds. (1996) Weeds of the Global Garden. Brooklyn Botanical Garden. 2. Jorgensen, Mortensen, Kjeldsen, and Schwarz (2003) Establishment, development and yield quality of fifteen <i>Miscanthus</i> genotypes over three years in Denmark. Acta Agriculturae Scandinavica: Section B, Soil and Plant Science 53: 190-199.	1. "Chinese silver grass...has become a popular ornamental grass in recent years." 2. <i>M. sinensis</i> is being tested as a potential biomass crop in Europe.
7.03		no evidence
7.04	Invasive Plant Atlas of New England (http://webapps.lib.uconn.edu/ipane/browsing.cfm?descriptionid=74)	"It can also be dispersed longer distances through its...wind-dispersed seeds."
7.05		no evidence
7.06		wind-dispersed grass
7.07		
7.08		wind-dispersed grass
8.01		
8.02		
8.03	Southeast Exotic Pest Council (http://www.invasive.org/eastern/eppc/MISI.html).	"For herbicidal treatments to be effective, the plants must be actively growing. Glyphosate has been shown to be effective in controlling miscanthus. A 2% solution of glyphosate thoroughly mixed with water is effective in the fall or late spring."
8.04	Sakanoue (2001) Long-term trends in <i>Miscanthus sinensis</i> grassland vegetation: a 20-year field observation. Grassland Science 47: 430-435.	"The level of <i>M. sinensis</i> in the sward was highest with cutting" [compared to control and grazing treatments]
8.05		