

MN NWAC Risk Assessment Worksheet (04-2011)	Common Name	Latin Name
	Giant Miscanthus, Giant Silver Grass, Giant Chinese Silver Grass	<i>Miscanthus x giganteus</i> J. M. Greef & Deuter ex Hodk. & Renvoize (Syn. <i>M. floridulus</i> , <i>M. japonicus</i>)
Reviewer	Affiliation/Organization	Date (mm/dd/yyyy)
James Calkins		09/12/2012

Giant miscanthus (*Miscanthus x giganteus*) is a tall (on average 8-12 feet, but can reach heights of 13-15 feet) perennial, rhizomatous, warm-season grass (Poaceae) that is native to Japan. It is a hybrid species between *Miscanthus sinensis* (Chinese silver grass) and *Miscanthus sacchariflorus* (Amur miscanthus). It is a triploid and sterile and produces no seed; plants rarely flower in Minnesota and spreads slowly by rhizomes. Giant miscanthus has low fertility requirements and performs well on poor soils and has spurred considerable interest in Europe and the United States as a biomass crop that can be used for energy production through direct combustion and the production of ethanol and other biofuels. Giant miscanthus also has potential as a biochar feedstock and may have the potential to play a role in carbon sequestration.

Although giant miscanthus tolerates a wide variety of soils and is relatively drought tolerant once established, it performs best on moist, fertile soils in full sun. It makes a striking statement in the landscape and is not easily lodged by wind and snow. It is hardy to USDA Cold Hardiness Zone 4.



Box	Question	Answer	Outcome (i.e., Go to box:?)
1	Is the plant species or genotype non-native?	Yes; a naturally occurring hybrid between <i>Miscanthus sinensis</i> and <i>M. sacchariflorus</i> ; both are native to Japan.	Go to Box 3
2	Does the plant species pose significant human or livestock concerns or has the potential to significantly harm agricultural production?	No.	
	A. Does the plant have toxic qualities that pose a significant risk to livestock, wildlife, or people?	No.	

Box	Question	Answer	Outcome (i.e., Go to box:?)
	B. Does the plant cause significant financial losses associated with decreased yields, reduced quality, or increased production costs?	No.	
3	Is the plant species, or a related species, documented as being a problem elsewhere?	No.	Go to Box 4
4	Is the plant species' life history & growth requirements are understood?	Yes.	Go to Box 6
5	Gather and evaluate further information:	(Comments/Notes)	
6	Does the plant species have the capacity to establish and survive in Minnesota?	Yes; hardy to USDA Zone 4.	
	A. Is the plant, or a close relative, currently established in Minnesota?	Yes.	Go to Box 7
	B. Has the plant become established in areas having a climate and growing conditions similar to those found in Minnesota?		
7	Does the plant species have the potential to reproduce and spread in Minnesota?	Yes; only by vegetative means – a sterile triploid.	
	A. Does the plant reproduce by asexual/vegetative means?	Yes; rhizomes.	Go to Question B
	B. Are the asexual propagules effectively dispersed to new areas?	No.	Go to Question C
	C. Does the plant produce large amounts of viable, cold-hardy seeds?	No; sterile.	Go to Question D
	D. If this species produces low numbers of viable seeds, does it have a high level of seed/seedling vigor or do the seeds remain viable for an extended period?	No; sterile, no seeds produced.	Go to Question E
	E. Is this species self-fertile?	No; <i>Miscanthus x giganteus</i> is sterile and does not produce viable seed; all <i>Miscanthus</i> spp. are self-incompatible and require out-crossing to produce viable seeds.	Go to Question G
	F. Are sexual propagules – viable seeds – effectively dispersed to new areas?	No.	

Box	Question	Answer	Outcome (i.e., Go to box:?)
	G. Can the species hybridize with native species (or other introduced species) and produce viable seed and fertile offspring in the absence of human intervention?	No.	Go to Question H
	H. If the species is a woody (trees, shrubs, and woody vines) is the juvenile period less than or equal to 5 years for tree species or 3 years for shrubs and vines?	No.	The plant is not currently believed to be a risk – No Regulatory Action
	I. Do natural controls exist, species native to Minnesota, that are documented to effectively prevent the spread of the plant in question?	No.	
8	Does the plant species pose significant human or livestock concerns or has the potential to significantly harm agricultural production, native ecosystems, or managed landscapes?	No.	
	A. Does the plant have toxic qualities, or other detrimental qualities, that pose a significant risk to livestock, wildlife, or people?	No.	
	B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?	No.	
	C. Can the plant aggressively displace native species through competition (including allelopathic effects)?	Yes.	
	D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?	No.	
	E. Does the plant have the potential to change native ecosystems (adds a vegetative layer, affects ground or surface water levels, etc.)?	Yes.	

Box	Question	Answer	Outcome (i.e., Go to box:?)
	F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?	No; apparently not; no specific information found.	
9	Does the plant species have clearly defined benefits that outweigh associated negative impacts?	Yes; does have benefits.	
	A. Is the plant currently being used or produced and/or sold in Minnesota or native to Minnesota?	Yes; not commonly grown in Minnesota.	
	B. Is the plant an introduced species and can its spread be effectively and easily prevented or controlled, or its negative impacts minimized through carefully designed and executed management practices?	Yes.	
	C. Is the plant native to Minnesota?	No.	
	D. Is a non-invasive, alternative plant material commercially available that could serve the same purpose as the plant of concern?		
	E. Does the plant benefit Minnesota to a greater extent than the negative impacts identified at Box #8?	Has significant potential as a biomass crop for energy production (direct combustion, cellulosic EtOH, gasification/syngas); 2X greater biomass production and 4X the EtOH production of corn; a risk assessment performed on <i>Miscanthus x giganteus</i> by Barney and DiTomaso (2008) recommended no regulation.	
10	Should the plant species be enforced as a noxious weed to prevent introduction &/or dispersal; designate as prohibited or restricted?		
	A. Is the plant currently established in Minnesota?	Yes.	
	B. Does the plant pose a serious human health threat?		

Box	Question	Answer	Outcome (i.e., Go to box:?)
	C. Can the plant be reliably eradicated (entire plant) or controlled (top growth only to prevent pollen dispersal and seed production as appropriate) on a statewide basis using existing practices and available resources?	Yes; mowing and glyphosate.	
11	Should the plant species be allowed in Minnesota via a species-specific management plan; designate as specially regulated?		
Final Results of Risk Assessment			
	Review Entity	Comments	Outcome
	NWAC Listing Subcommittee	Not thought to be a threat in MN at this time.	No Regulatory Action.
	NWAC Full-group		No Regulation. Recorded to NWAC Database
	MDA Commissioner		
File #	MDARA00015MISGIG_1_18_2013		

References:

(List any literature, websites, and other publications)

1. Barney, J. and J. DiTomaso. 2008. Nonnative Species and Bioenergy: Are We Cultivating the Next Invader? *BioScience* 58(1):64-70.
2. Gordon, D.R., K.J. Tancig, D.A. Onderdonk, and C.A. Gantz. 2011. Assessing the Invasive Potential of Biofuel Species Proposed for Florida and the United States Using the Australian Weed Risk Assessment. *Biomass and Bioenergy* 35:74-79.
3. Jørgensen, U. 2011. Benefits Versus Risks of Growing Biofuel Crops: The Case of Miscanthus. *Current Opinion in Environmental Sustainability* 3:24-30.
4. University of Minnesota Extension. 2012. Miscanthus (*Miscanthus x giganteus*) for Biofuel Production. <http://www.extension.org/pages/26625/miscanthus-miscanthus-x-giganteus-for-biofuel-production>
5. Matlaga, D.P., B. Schutte, and A.S. Davis. 2012. Age-Dependent Population Dynamics of the Bioenergy crop *Miscanthus x giganteus* in Illinois. *Journal of Invasive Plant Science and Management*. 5:238-248. http://www.ars.usda.gov/research/publications/publications.htm?seq_no_115=272059

6. University of Minnesota. 2011. Miscanthus Ornamental & Invasive Grass. <http://miscanthus.cfans.umn.edu>
7. USDA Natural Resources Conservation Service. 2011. Planting and Managing Giant Miscanthus as a Biomass Energy Crop. Technical Note No. 4. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044768.pdf.