

Miscanthus sinensis [简体中文](#) [正體中文](#)

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

Common name plume grass (English), maiden grass (English), eulalia (English, Australia), pampas grass (English), Japanese silver grass (English), Chinese silver grass (English), Gemeines Chinaschilf (German, Germany), eulalia grass (English), Chinese fairy grass (English, Germany), Chinesisches Stielbluetengras (German), zebra grass (English), prachtriet (English, Netherlands), miscanthus (English), susuki (Japanese, Japan), Schilffras (German, Germany)

Synonym *Eulalia japonica* , Trin.
Miscanthus condensatus , Hack.
Miscanthus purpurascens , Anderss.
Miscanthus sinensis , var. *condensatus* (Hack) Makino
Miscanthus sinensis , var. *formosanus* Hack.
Miscanthus sinensis , f. *glaber* Honda
Miscanthus sinensis , var. *gracillimus* Hitchc.
Miscanthus sinensis , var. *purpurascens* (Anderson) Matsum.
Miscanthus sinensis , var. *variegatus* Beal
Miscanthus sinensis , var. *zebrinus* Beal
Saccharum japonicum , Thunb.
Xiphagrostis condensatus , (Hack) W. Wight

Similar species *Saccharum giganteum*, *Miscanthus sacchariflorus*, *Andropogon gerardii*

Summary Originally introduced from Asia in the nursery trade, *Miscanthus sinensis* is one of the most common ornamental plants. Its height and fast growth enable it to eclipse native vegetation growing close to the soil surface. Although it has not caused as much damage as some invasive grasses, its ability to inhabit disturbed areas and its popularity as an ornamental species make it a serious threat to native flora.



[view this species on IUCN Red List](https://www.iucn.org/redlist)

Species Description

Miscanthus sinensis is a robust perennial plant that can reach up to 3m (10 feet) in height. It is usually found in large clumps. It consists of long arching branches and leaves that spread or droop. The leaves can be up to a metre (3 feet) long and 25mm (1 inch) wide. Each leaf has a silvery-white midrib with sharp tips that are re-curling. (USDA Forest Service, 2006). Mature plants have large, showy, feather-like flowers appearing in Sept.-Oct. It has very short, inconspicuous rhizomes. (Meyer, 2003(a)). Pinkish-silvery 8-10" plumes remain into the winter. *M. sinensis* turns a rich golden brown in the winter and the colour persists throughout the season. (Gilman, 1999).

"The fan-shaped terminal panicle is 15cms to 60cms (6 to 24 inches) long and can be silvery to pale pink in colour. The branches of the panicle are erect or ascending. These panicles reach full maturity in the fall. The glabrous spikelets are very small, yellow-brown in colour and encircled at the base with white or purple-coloured hairs. The fertile lemma contains an awn that is spirally twisted at its base." (USDA Forest Service, 2006). The seeds are yellowish brown to slightly reddish, sparsely hairy, and have a twisted tip. They occur from September to January and have membranous husks with a hidden grain. (Miller, 2003)

Uses

Miscanthus sinensis is most commonly used as an ornamental plant. (ARS-GRIN, 2005). As an ornamental, it is used as a mass planter, yard border, privacy screen, container or above-ground planter, or as an accent. (Gilman, 1999). It has the potential to be used as biomass for energy production. (ARS-GRIN, 2005). The flowers of *M. sinensis* can be used for dyeing. (MSUE, 1999). *M. sinensis* has been found to slow runoff in areas with concentrated flow erosion from agricultural fields. After 4 years, researchers found that *M. sinensis* had 20cms to 38cms (8-15 inches) of sedimentation deposits above the plants. (Ritchie *et al*, 2006). *M. sinensis* is appreciated for its winter appearance, including: persistent fruits, a showy trunk, and an overall golden brown colour. (Gilman, 1999).

Habitat Description

Miscanthus sinensis can adapt to several different habitats, but prefers rich, moist, well-drained soil to attain maximum growth potential. (The Bugwood Network *et al*, 2003). Plants can tolerate cold climates, but do not grow well in humid, hot southern climates. Horticulturalists claim that the plant can live between USDA hardiness zones 5-9, able to survive temperatures as low as -26°C (-14.8 F). (USDA Forest Service, 2006). Once established, *M. sinensis* can tolerate a variety of poor conditions, including soils of various pH, compacted soils, nutrient poor soils, heat, and drought. (OSU, undated). The plant doesn't survive in soil with a high salt content. (Gilman, 1999) *M. sinensis* is intolerant of shade but can be found in sparsely forested areas and small sunlit openings. Common in many natural and disturbed areas, *M. sinensis* is often found on abandoned home sites, roadsides, forest edges, sides of reservoirs, and in old fields following fires. (The Bugwood Network *et al*, 2003).

Reproduction

Miscanthus sinensis reproduces primarily through rhizomes, however it does make seeds which are mainly dispersed by wind. (USDA Forest Service, 2006). Large buildup of seeds in seed banks can also lead to further establishment of *M. sinensis*. (Meyer, 2003(a)).

General Impacts

D'Antonio and Vitousek (1992) report that fast growing grasses (*M. sinensis*) can reduce the photosynthetic capability of competitors by reducing light availability at the soil surface. In Japan, *M. sinensis* colonized abandoned fields, reducing the regeneration or encroachment of oak seeds by reducing the light availability and daily carbon gain by oak seedlings.

M. sinensis is known to carry several pathogens, including barley yellow dwarf luteovirus-MAV, barley yellow dwarf luteovirus-PAV, and cereal yellow dwarf luteovirus. (Harris *et al*, 2000).

Management Info

Physical: Digging out the root system, especially the entire rhizome, is a proven method for removing individual plants. (Meyer, 2003(a)). USDA Forest Service (2006) warns that digging out plants will probably result in resprouts and would need further treatment. Cutting and disking methods may also result in increased dispersal due to rhizome pieces that are cast into uninhabited areas. Meyer (2003(a)) also recommends looking for flowers in the fall and removing them early to eliminate self-seeding. Removing the seed head also helps curb seed bank deposits and control plant spread. (Meyer, 2003(a)). Repeated mowing, as short as possible throughout the summer may kill *M. sinensis* in as few as 2 seasons. Areas with a larger seed bank will take longer. *M. sinensis* cannot tolerate repeated mowing during growth season, however, dormant stage cutting of plants may increase growth if cuttings are removed. Grazing has proved to be a successful management tool in Japan, stopping the plant's growth by allowing cattle, horses, and sheep to graze on *M. sinensis* in the beginning of June. Burning increases growth, vigor, and seedset of *M. sinensis*. "Burning should only be done as a management practice when it can be followed by chemical control". (Meyer, 2003(a)). Proposed ideas to develop sterile forms of *M. sinensis* could be a great solution to the green industry and for commercial selling of plants. (Li et al, 2004).

Chemical/Mechanical: Late winter/early spring: remove previous year's growth by cutting or burning entire plant to ground. This enables higher chemical control efficiency. When growth is 12" tall, spray with glyphosate (Meyer, 2003(a)) or imazapyr. (USDA Forest Service, 2006). Allow the plant to die and cut dead foliage back to ground. If previous year's growth still exists, wait until plant reaches 12-24" prior to spraying. Repeat spraying if necessary in late summer or fall when regrowth is 12" tall. An abundant amount of green foliage is necessary for effective chemical control. (Meyer, 2003(a)). Miller (2003) recommends Arsenal AC as a one percent solution for control of *M. sinensis*, or a combination of glyphosate and arsenal AC. In the fall, a 2% solution of Roundup or 1% solution of fusilade should be effective against *M. sinensis*. In the spring, apply a 4% solution of Roundup or 2% solution of fusilade. (Morisawa, 1999).

M. sinensis can tolerate a high intensity of salt spray at an inland position. In one study, the salt spray combined with sandblasting limited the establishment of many grasses to the dune and beach area. Sandblasting was found to regulate the establishment of *M. sinensis* near beaches. (Yura & Ogura, 2006).

Pathway

M. sinensis was introduced from Asia about a century ago for ornamental plantings. (Swearingen et al, 2002)

Principal source:

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review:

Publication date: 2011-02-17

ALIEN RANGE

[2] AUSTRALIA
[28] UNITED STATES

[1] CHILE

BIBLIOGRAPHY

25 references found for *Miscanthus sinensis*

Management information

Gilman, E. 1999. *Miscanthus sinensis*. Fact Sheet FPS-405. University of Florida. Cooperative Extension Service, Institute of Food and Agricultural Services.

Summary: A fact sheet with a good description of plant characteristics and management information. Available from: <http://hort.ufl.edu/shrubs/MISSINA.PDF> [Accessed 22 November 2006]

Li, Y., Cheng, Z., Smith, W., Ellis, D., Chen, Y., Zheng, X., Pei, Y., Luo, K., Zhao, D., Yao, Q., Duan, H., Li, Q. 2004. Invasive Ornamental Plants: Problems, Challenges, and Molecular Tools to Neutralize Their Invasiveness. *Critical Reviews in Plant Sciences*, 23(5):381-389.

Summary: Gave information about Connecticut, U.S. s labeling of *M. sinensis* as a potentially invasive species.

Meyer, M. 2003. Fact Sheet and Management of *Miscanthus sinensis*. University of Minnesota.

Summary: Good management information.

Meyer M., J. Paul and N. Anderson 2010. Competitive ability of invasive *Miscanthus* biotypes with aggressive switchgrass. *Biological Invasions* 12, 3809-3816.

Miller, James H. 2003. [Nonnative invasive plants of southern forests: a field guide for identification and control. Gen. Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.](#)

Summary: Plant description and a small amount of management information.

Available from: <http://www.invasive.org/eastern/srs/CS.html> [Accessed 27 November 2006]

Morisawa, T. 1999. [Weed Notes: *Miscanthus sinensis*. Wildland Invasive Species Team. The Nature Conservancy.](#)

Summary: Excellent source for management information.

Available from: <http://tncweeds.ucdavis.edu/moredocs/missin01.pdf> [Accessed 21 November 2006]

Quinn L.D., D.J. Allen and J.R. Stewart 2010. Invasiveness potential of *Miscanthus sinensis*: implications for bioenergy production in the U.S. *GCB Bioenergy* 2, 310-320.

Quinn L.D., D.P. Matlaga, J.R. Stewart and A.S. Davis 2011. Empirical evidence of long distance dispersal in *Miscanthus sinensis* and *Miscanthus x giganteus*. *Invasive Plant Science and Management* 4, DOI: 10.1614/IPSM-D-1610-00067.00061.

Swearingen, J., Reshetiloff, K., Slattery B., and S. Zwicker. 2002. [Plant Invaders of Mid-Atlantic Natural Areas. National Park Service & U.S. Fish and Wildlife Service.](#)

Summary: Includes information on prevention, management, and alternative plants.

Available from: <http://www.invasive.org/eastern/midatlantic/misi.html> [Accessed 29 November 2006]

[The Bugwood Network, USDA Forest Service & USDA APHIS PPO, The University of Georgia - Warnell School of Forest Resources and College of Agricultural and Environmental Sciences-Department of Entomology. 2003. Southeast Exotic Pest Plant Council Invasive Plant Manual. Invasive Plants of the Eastern United States.](#)

Summary: Includes plant description and management information.

Available from: <http://www.invasive.org/eastern/eppc/MISI.html> [Accessed 22 November 2006]

[USDA Forest Service, Forest Health Staff. 2006. Chinese Silvergrass-*Miscanthus sinensis* Anderss. Weed of the Week.](#)

Summary: Habitat, management, and plant description information.

Available from: http://www.na.fs.fed.us/fhfp/invasive_plants/weeds/chinese-silvergrass.pdf [Accessed 28 November 2006]

General information

[CONABIO. 2008. Sistema de información sobre especies invasoras en México. Especies invasoras - Plantas. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. Fecha de acceso.](#)

Summary: English:

The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (<http://www.conabio.gob.mx/invasoras/index.php/Portada>), under the section Novedades for information on updates.

Invasive species - Plants is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]

Spanish:

La lista de especies del Sistema de información sobre especies invasoras de México cuenta actualmente con información acerca de nombre científico, familia, grupo y nombre común, así como como hábitat, estado de la invasión en México, rutas de introducción y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la página de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualización, por favor consulte la portada (<http://www.conabio.gob.mx/invasoras/index.php/Portada>), en la sección novedades, para conocer los cambios.

Especies invasoras - Plantas is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]

D Antonia, C., and Vitousek, P. 1992. Biological Invasions by Exotic Grasses, the Grass/Fire Cycle and Global Change. *Annual Review of Ecology and Systematics*. 23:63-87.

Summary: This paper briefly discusses some of the general impacts of *M. sinensis*.

[Harris, A., Small, N., Gibbs, A.J., Gibbs, M.J., Weiller, C. 2000. Viruses, Phytoplasmas and Spiroplasmas of Clonal Grasses and Their Diagnosis. Plant Biosecurity, Biosecurity Australia.](#)

Summary: Includes general information about *M. sinensis*, and gives a number of common names.

Horton J.L., R. Fortner and M. Goklany 2010. Photosynthetic characteristics of the C4 invasive exotic grass *Miscanthus sinensis* Andersson growing along gradients of light intensity in the southeastern USA. *Castanea* 75, 52-66.

[ITIS \(Integrated Taxonomic Information System\). 2007. Online Database *Miscanthus sinensis*](#)

Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=41874 [Accessed 3 May 2007]

[Ma, Q. Undated. The University of Tennessee Herbarium-TENN. TENN Vascular Plants-Database Results. Monocots: Poaceae](#)

Summary: A distribution map of *M. sinensis* in Tennessee.

Available from:

<http://tenn.bio.utk.edu/vascular/database/vascular-database.asp?CategoryID=Monocots&FamilyID=Poaceae&GenusID=Miscanthus&SpeciesID=sinensis> [Accessed 21 November 2006]

[Meyer, M. 2003. Identification and Description of *Miscanthus*. University of Minnesota.](#)

Summary: Comparison of *M. sinensis* and a similar species, *M. sacchariflorus*.

Available from: <http://horticulture.coafes.umn.edu/miscanthus/identification.html> [Accessed 27 November 2006]

[Michigan State University Extension. 1999. *Miscanthus sinensis*- Japanese Silver Grass. Ornamental Plants plus Version 3.0.](#)

Summary: Discusses uses and propagation.

Available from: <http://web1.msue.msu.edu/imp/modzz/00000959.html> [Accessed 28 November 2006]

[Ritchie, J.C.; Kemper, W.D.; & J.M. Englert. 2006. Narrow stiff grass hedges for erosion control. Human Impact on Erosion and Sedimentation. pp. 195-203. IAHS Publication. no. 245.](#)

Summary: This abstract explains how *M. sinensis* has been used to stop erosion from agricultural fields.

Available from:

<http://md1.csa.com/partners/viewrecord.php?requester=gs&collection=ENV&recid=4269099&q=miscanthus+sinensis&uid=1076031&setcookie=yes> [Accessed 27 November 2006]

Stewart J.R., Y. Toma, F.G. Fernandez, A. Nishiwaki, T. Yamada and G. Bollero 2009. The ecology and agronomy of *Miscanthus sinensis*, a species important to bioenergy crop development, in its native range in Japan: a review. *GCB Bioenergy* 1, 126-153.

[Symes, P. 2004. Online Discussion Forum. CRC Weed Management.](#)

Summary: Discussed the presence of *M. sinensis* in Sydney, Australia.

Available from: http://www.weeds.crc.org.au/potentialweeds/potential_weeds_m.html#miscanthus [Accessed 20 November 2006]

[Tennessee Exotic Plant Pest Council \(TNEPPC\). 2004. Invasive Exotic Pest Plants in Tennessee.](#)

Summary: Explains and states the ranking of exotic plants in Tennessee.

Available from: <http://www.tneppc.org/TNEPPC2004PlantList-8x11.pdf> [Accessed 28 November 2006]

Wilson S.B. and G.W. Knox 2006. Landscape performance, flowering, and seed viability of 15 Japanese silver grass cultivars grown in Northern and Southern Florida. *Horttechnology* 16, 686-693.

Yura, H., and A. Ogura. 2006. Sandblasting as a possible factor controlling the distribution of plants on a coastal dune system. *Plant Ecology*, 185:199-208.

Summary: Discussed the ecological factors limiting *M. sinensis* to inland ecosystems.