

### Mini data sheet on *Miscanthus sinensis*

**Added to the EPPO Alert List in 2011 - Deleted in 2018**

**Reasons for deletion:**

*Miscanthus sinensis* was added to the EPPO Alert List in 2011 but as no immediate risk was perceived, it was transferred to the Observation List in 2018.

#### **Why**

*Miscanthus sinensis* (Poaceae) is a tall perennial grass originating from Asia. It is used for ornamental purposes, and is increasingly being planted as a crop for biofuel production. Its common name is 'Chinese silver grass'. It spreads via a prolific seed production. It is considered invasive in the USA, and some escapes have already been noted in the EPPO region in Austria, Belgium, Czech Republic, France, Georgia, Germany, Italy, Russia, Switzerland, Spain, the United Kingdom. Because it has shown invasive behaviour where it has been introduced elsewhere in the world, and is increasingly planted while no risk analyses have been undertaken on its invasive behaviour, this species should be monitored. *Miscanthus sacchariflorus* may also represent a risk, although much less information is available on this species.

#### **Geographical distribution**

**EPPO region:** Austria, Belgium, Czech Republic, France, Georgia, Germany, Italy, Russia (native), Switzerland, Spain, the United Kingdom.

**North America:** USA (Alabama, California, Colorado, Connecticut, District of Columbia, Delaware, Florida, Georgia, Illinois, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, North Carolina, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, West Virginia), Canada (Ontario).

**Asia (native):** China, Indonesia, Japan, Philippines, Republic of Korea, Taiwan.

**Oceania:** Australia (New South Wales, Tasmania), New Zealand

**South America:** Chile

#### **Morphology**

*M. sinensis* is a robust perennial herb reaching up to 2 m high (occasionally 3 m), usually found in clumps. Mature plants have extensive root systems. Leaves can reach 1 m long and 25 mm wide, each with sharp margins. Panicles are large and feather like, 15-60 cm long, silvery to pale pink, which remain during winter and become golden brown. Seeds are yellowish brown to slightly reddish, sparsely hairy, with a twisted tip, 3-4 mm long.

#### **Habitats**

The species is often found on riverbanks, roadsides, forest edges and abandoned fields following fires. According to the Corine Land Cover nomenclature, these habitats correspond to: banks of continental water, riverbanks/canal sides (dry river beds), pastures, road and rail networks and associated land, other artificial surfaces (wastelands).

#### **Biology and ecology**

*M. sinensis* prefers rich, moist, well-drained soils and can tolerate various pH. *M. sinensis* can even grow both on nutrient poor soils and on soils rich in heavy metals. The species can tolerate cold temperatures, as well as heat and drought, but does not grow well in humid, hot southern climates. It is reported from cold areas (plant hardiness zone 5), to hot areas (plant hardiness zone 9). *M. sinensis* needs full light to establish and reproduce.

The species reproduces vegetatively through rhizomes. New growths emerge in mid spring and replace the previous year's dried erect leaves. Rhizomes allow a moderate horizontal expansion. The species also reproduce by seeds. Flowering takes place in August-October in

the Northern hemisphere. Each plant can produce 100 panicles producing 6500 to 140 000 seeds per m<sup>2</sup>. Seeds occur from September to January and are dispersed by wind up to 400 m from the mother plant, or via machinery. Spread by rivers has also been reported. The seed viability depends on the varieties.

### Pathways

*M. sinensis* is used as an ornamental plant for its large inflorescences, as well as a barrier along roadsides and agricultural fields. Many varieties exist and for example in France, the species is increasingly being used in gardens and for the flowering of the urban spaces. It is also increasingly being used as a biofuel species. In France, 600 ha have been planted with *Miscanthus* spp. in 2007. In Great Britain, plantations are well developed, 204 varieties were planted in the Ceredigion (formerly Cardiganshire). The species may also be used in phytoremediation on polluted soils.

### Impacts

Cases of escapes have been noted: in Austria, in the Voralberg valley, the planted populations spread along a river; in France, the species escaped from urban plantations in La Roche-sur-Yon.

These fast-growing grasses can reduce the photosynthetic capacity of competitors by reducing light availability at the soil surface. *M. sinensis* is also reported to carry several pathogens, in particular *Barley yellow dwarf virus-MAV*, *Barley yellow dwarf virus-PAV* and Cereal yellow dwarf virus. In addition, the species is very flammable and may enhance fire hazards.

### Control

Cutting panicles will prevent the spread of the plant through seeds.

The ability of the plant to produce new shoots from pieces of rhizome makes control difficult. Mechanical destruction methods such as cutting and disking methods may result in the spread of parts of rhizomes. Repeated mowing may kill the plant in 2 seasons, and is particularly efficient when it is in a growing stage and combined with grazing of cattle, horses or sheep.

Digging out the root system is an efficient method for removing individuals, but may result in resprouts that would require further treatment if the whole roots system is not removed. Burning increases growth, vigor and seed set.

Chemical control may also be efficient but the treatment of an abundant amount of green foliage is necessary.

In conclusion, *Miscanthus sinensis* may have the potential to establish in most of the EPPO region, in particular in the Continental and Atlantic biogeographical regions. The invasive behaviour of the species has not been clearly demonstrated so far, but monitoring of this species and of other *Miscanthus* species in the EPPO region will provide useful information.

### Sources

Global invasive species database - *Miscanthus sinensis*.

<http://www.issg.org/database/species/ecology.asp?si=1121&fr=1&sts=sss&lang=EN>

Schnitzler A (2011) *Miscanthus* : l'homme cultive-t-il un nouvel envahisseur? Agence de l'eau Rhin-Meuse. 41 pp. [http://www.liebe.univ-](http://www.liebe.univ-metz.fr/rapports/2011%20A%20Schnitzler%20Miscanthus%20AERM.pdf)

[metz.fr/rapports/2011%20A%20Schnitzler%20Miscanthus%20AERM.pdf](http://www.liebe.univ-metz.fr/rapports/2011%20A%20Schnitzler%20Miscanthus%20AERM.pdf)

Southeast Exotic Pest Plant Council, Invasive Plant Manual - *Miscanthus sinensis*. [http://www.se-](http://www.se-eppc.org/manual/MISI.html)