



# Diseases of Miscanthus rhizome: hidden threat for the development of biomass cultivations



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The **aim of the work** is to study the rot of rhizomes of *Miscanthus sacchariflorus* and determine their species

Affected rhizomes, selected in an experimental field with *Miscanthus*. The field is located in the Novosibirsk region, Russian Federation.



Fig. 1 Digging out the rhizomes of miscanthus



Fig. 2 Healthy miscanthus rhizomes

## Methods

Diagnostics of fungal pathogens of the affected parts of the rhizomes was carried out. Parts of the rhizomes were cut into pieces of 1–2 cm, sterilized, and placed on a nutrient substrate - Czapek's medium in Petri dishes. The germinated mycelium from the part of the infected material was transferred to a clean medium for further growth. Mushrooms of the species *Fusarium* spp. and *Mucor* sp. were isolated from the affected parts of the tissues of rhizomes.



Fig. 3 Infected miscanthus rhizomes



Fig. 4 Mycelial growth of *Fusarium*



Fig. 5 Mycelial growth of *Fusarium*

## Results

*Miscanthus sacchariflorus* is widely cultivated in Sibiria, increasing its vulnerability to diseases during production. Little is known about diseases of miscanthus, one of the most important possible bioenergy crops in the world. In 2018, in an experimental field located in the Novosibirsk region, Russian Federation, was observed a decrease in yields *Miscanthus*, associated with a decrease in the biomass of rhizomes. Rot on the rhizomes of *Miscanthus* were discovered as a result of field study. Extensive soft rot, accompanied by a brownish color and lack of viable roots and buds, was observed on the affected rhizomes. Cross sections of rhizomes studied. The color change affected the cortical and internal tissues of the rhizomes. Phytopathological studies revealed the presence of pathogenic fungal species (*Fusarium* and *Mucor*) causing miscanthus rhizome rot. Reduction of the number of roots per rhizome and root and shoot length decrease was also observed.

## Conclusions

Pathogens colonizing rhizomes in the soil lead to a decrease in the aboveground and underground productivity of the crop. Therefore, the rhizomes for the presence of fungal infections must be assessed in order to obtain healthy planting material and its further transfer to interested parties in other regions of the country. It is important for the commercialization of *Miscanthus* rhizomes.