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## INTRODUCTION

Ornamental Grasses are a large family of beautiful plants that add texture, color and movement to the garden. Growing ornamental grasses is also a cost-effective and environmental friendly technology for the remediation of waste water polluted by toxic substance, which is an emerging area of global interest. *Miscanthus sinensis* 'Strictus' - porcupine grass is a highly demanded high-value ornamental grass with stiff leaves and yellow bands. They are the darlings of garden designers and are easy to grow and maintain. Traditional hybridization breeding created presentday commercial varieties, and is continuing to provide new varieties. Because of sophisticated genetic background, it is difficult to use hybridization breeding methods to modify one or two deficit characteristics (such as disease resistance, heat or drought tolerance) in grasses. In vitro breeding, mutation breeding and plant tissue culture-based genetic engineering provide new ways for improving certain characteristics in existing grass varieties. Presented here is our research on the establishment of high efficient micro-propagation systems in ornamental grass *Miscanthus sinensis* 'Strictus' which is a potential technology for in vitro breeding.

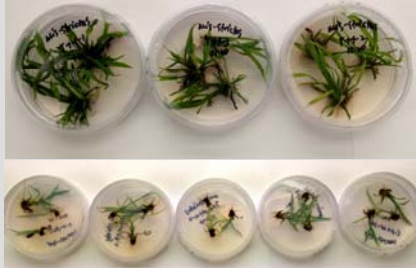


Figure 1. *Miscanthus sinensis* 'Strictus' in vitro multiplication (up) and rooting (down) test

## MATERIALS AND METHODS

Meristem from pot plants were collected in a clean hood and the surface was sterilized sequentially in tape water wash 1 hr → 75% ethanol 30" → 20% Clorox 20 min → sterile ddH<sub>2</sub>O wash 5 times → dip dry on sterile paper towel. Shoot induction and proliferation media were MS basal medium (MSO) contain various level of BA, TDZ and IAA. Plantlet rooting media included MSO and MS with 1g/L activated charcoal(MAC). Rooted plantlets were transferred to peat moss: perlite: vermiculite=1:1:1 soil and acclimatized in growth chamber and greenhouse.



Figure 2. *Miscanthus sinensis* 'Strictus' high efficient rooting in charcoal contained medium

## RESULTS

Both BA and TDZ supplemented IAA could make the meristems germination and proliferation. TDZ result strong stimulating effect on shoot number proliferation than BA. Media browning is a problem when shoot proliferation time longer than 25 days in same medium. MAC medium is better than MSO in shoot rooting, and a mean number of 4 roots/plant was obtained in MAC. Greenhouse acclimatization is more efficient in plant growth than growth chamber.



Figure 3. *Miscanthus sinensis* 'Strictus' plantlets ready for acclimatization

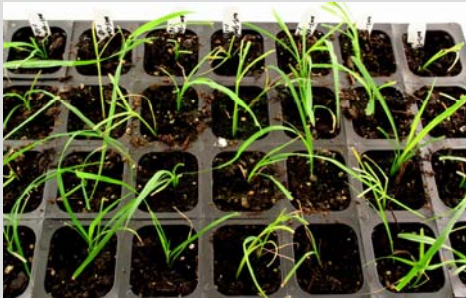


Figure 4. *Miscanthus sinensis* 'Strictus' acclimatization for one month in growth chamber



Figure 5. *Miscanthus sinensis* 'Strictus' acclimatization for one month in greenhouse



Figure 6. Tissue culture plants in 5.5" pot three months after acclimatization in greenhouse



Figure 7. No variation observed between tissue cultured plants and mother plant

Tissue cultured *Miscanthus sinensis* 'Strictus' is a quick grower and grows well in full sun conditions.

## CONCLUSIONS

1. High frequency micro propagation system was established in *Miscanthus sinensis* 'Strictus'(Fig. 1) .
2. Efficient and quality roots formed when in vitro shoots were cultured in MS basic medium supplemented with 0.1% (w/v) activated charcoal for 20 days(Fig. 2, Fig. 3)
3. Compared to growth chamber, greenhouse condition significantly promotes plantlet growth in acclimatization stage (Fig. 4, Fig. 5).
4. It takes 3 months for tissue-cultured plants to become a marketable product (5.5" pot 2.5 feet in height plants) (Fig. 6).
5. No variation was observed(Fig. 7). Future work will focus on in vitro breeding system establishment and media brown study.

## ACKNOWLEDGEMENTS

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