

## **PP10. Effect of macro- and micro-element-deficiency on growth and essential-oil composition of *Mentha arvensis* L. cultivated in solution**

Suzan Kelly Vilela Bertolucci<sup>1</sup>, Alexandre Alves de Carvalho<sup>1</sup>,  
Felipe Campos Figueiredo<sup>1</sup>, José Eduardo Brasil P. Pinto<sup>1</sup>

*Keywords:* medicinal plant, hydroponic system, nutrient omission, fertilization

Because of its olfactory properties, the essential oil (EO) of *Mentha arvensis* L. is readily used in perfumery and cosmetics and has a great commercial value. However, the agronomic aspects of *M. arvensis* cultivation were not sufficiently studied. Herein, we assessed the effect of the absence of selected macro- and micronutrients on the growth and essential-oil composition of *M. arvensis* cultivated in solution. The experiment was completely randomized, with three replications and 12 treatments. Acclimated scions of *M. arvensis* were transferred into pots containing either the complete Hoagland & Arnon (HA) nutrient solution or modified HA solution, deficient in one of the following macro- or microelements: N, P, K, Ca, Mg, S, B, Cu, Fe, Mn and Zn. The experimental plot consisted of one plant per pot. Plants were cultured in the greenhouse under natural light for 45 days, during which air was supplied to the nutrient system and the nutrient solution was changed each week [1]. Plants were harvested at the end of the culture period and growth parameters (development and appearance of leaves, shoots, roots and the total dry weight) and leaf EO composition were evaluated. The results showed that the composition of the nutrient solution exerted a significant effect on all of the growth parameters and essential-oil chemical profile. With regard to the total dry matter, the order of limiting nutrients was N=Ca>P=B>K=S>Fe=Mg>Zn=Mn>Cu=HA. The most pronounced changes in the *M. arvensis* development were observed in the absence of N, P, Ca and B. The omission of Mn and Cu in the culture solution did not adversely affect the growth of *M. arvensis*. Omission of B, P, Ca, Mg and S from the nutritive solution resulted in a higher production of menthol, relative to the control.

### *References:*

[1] Alvarenga, I.C.A., et al., 2015. *Sci. Hortic.-Amsterdam* 197, 329–338.

*Acknowledgments* The authors wish to thank the CNPq, FAPEMIG and CAPES for their financial support of the study and for the fellowships awarded.

---

<sup>1</sup>Departament of Agronomy, Medicinal Plants, Lavras University, C. P. 3037, Lavras, MG, CEP 37200-000, Brazil.

\*Corresponding author. Email: [suzan@dag.ufla.br](mailto:suzan@dag.ufla.br)