



## Biomass and essential oil of lavender under protected cultivation and organic fertilization

Sérgio M. Silva<sup>1</sup>, José Magno Q. Luz<sup>1</sup>, Flarraniery O. Schiavioni, Arie F. Blank<sup>2</sup>, Mércia F. Alves<sup>2</sup>, Péricles B. Alves<sup>2</sup>

<sup>1</sup> Universidade Federal de Uberlândia – Minas Gerais – Brazil

<sup>2</sup> Universidade Federal de Sergipe – Sergipe - Brazil  
jmagno@umuarama.ufu.br

Keywords: Lavender, organic fertilizers, essential oil, harvesting.

*Lavandula dentata* (Lamiaceae) is a species cultivated in the fields of Europe, North America, Central and South America, to industrial scale production of essential oil with high quality (1). Among its main features, lavender is resistant to drought and has high rusticity, requiring good soil drainage and average rainfall (2). For lavender cultivation and another aromatics plants, are needed more explications about advantages and disadvantages to using organic or mineral fertilizers, aiming more security in production and quality of their chemical compounds (3). The objective of this study was to assess the effects of greenhouse and organic fertilization in lavender biomass and essential oil. The experimental design was a randomized complete block design with four replications in split-plot, and those relating to fertilizers plots and subplots concerning flower crops. The treatments consisted of different doses of this fertilizer formulated in NPK (10-10-10) with 8% organic carbon from the recommendation of 500 kg ha<sup>-1</sup>, 100% (T1), 80% (T2) 60% (T3), 40% (T4) and 20% (T5), and the recommended mineral fertilization of 500 kg ha<sup>-1</sup> formulated in NPK (10-10-10) (T6). Three harvests of flowers were performed at 100, 145 and 180 days after planting. Was evaluated fresh flowers, content, yield and chemical composition of essential oil. The flowers were harvested early in the morning, to 30 cm of soil and taken to the laboratory. The essential oil extractions were made by hydrodistillation with modified Clevenger apparatus. The chemical composition was performed by gas chromatography coupled to mass spectrometry. The results showed that mass flowers was no significant difference between fertilizers. Yields of biomass were obtained close to 4 t ha<sup>-1</sup>. It was observed a significant increase in mass of flowers between the first and second crop for all fertilizers, as well as a decrease of production in the end of the harvest. Successive crops also resulted in gains in essential oil yield of up to 20 kg ha<sup>-1</sup>. Average contents of essential oil of 0.60% were obtained. The dose of 60% of organic fertilization showed the best performance in biomass and essential oil yield, at the three crops of flowers. There were found more than 20 substances in the essential oil of *L. dentata* and the majority were 1,8-cineol, fenchone and camphor. The two types of fertilizer provided increments the production of 1,8-cineole. The chemical composition of essential oil of lavender is affected by the conditions of protected cultivation and the seasons of harvest.

1. Verma, R. Jour. Serb. Chem. Soc., 2010, **75**, 343-348.

2. McNaughton V. Lavender. Timb. Press, 2006, 192p.

3. Shekofteh, H.; Shafie, S.; Mahmodi, Y. Int. J. Agr., 2013, **3**, 401-408.

Acknowledgements: Fapemig, CNPq, CAPES, Geociclo.