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Abstract

Productive and Qualitative Response of Organic Lemon Balm Treated with Different Foliar Biostimulants

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Abstract: Lemon balm (*Melissa officinalis* L.) is a medicinal and aromatic plant (MAP) belonging to the *Lamiaceae* family. Thanks to the presence of high amount of secondary metabolites, such as phenolic compounds, flavonoids and essential oils in the aerial parts, this species is a well-known herb for different pharmaceutical, food/beverage, and cosmetic uses. Like other MAPs, lemon balm shows significant variations in productive and qualitative parameters due to the effect of biotic and abiotic factors. The quantity of secondary metabolites represents a marker for MAPs quality evaluation. The aim of this study was to assess the effects of foliar treatments with 4 different commercial biostimulant (B), based on *Eklonia maxima*, *Ascophillum nodosum*, fulvic acid, protein hydrolysates, and two application frequencies (F) on productive and qualitative parameters of lemon balm under organic agriculture conditions. The control treatment was provided by water only. After harvest, a number of parameters, such as plant height, total fresh yield, total dry yield, total phenolic, antioxidant activity, rosmarinic acid were measured. Morphological, productive and qualitative traits were affected by both experimental factors and their interaction. The highest plant height was observed in plants exposed to protein hydrolysates. The highest fresh and dry yields were obtained in plants treated with fulvic acids applied every two weeks. The highest phenolic content was found in plants treated, weekly, with fulvic acids and protein hydrolysates. The highest antioxidant activity was recorded in plants treated - every two weeks - with *E. maxima*-based seaweed extract. Overall, this study represents an important step towards organic cultivation of MAPs.

Keywords: Lemon Balm; Biostimulants; Yield; Secondary Metabolites; Organic.