

Effects of compost extract and biofertilizers on quantitative and qualitative yield and different cuttings of sweet majoram (*Majorana hortensis* L.)

S. Khorramdel^{1*} and S.M. Seyyedi¹

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Abstract

Sweet majoram (*Majorana hortensis* L.) is one of the native Iranian medicinal plants, which due to its aromatic secondary metabolites is used in traditional medicine. In production of medicinal plants, application of organic inputs has especial role in sustainable agriculture. Organic inputs, such as manures and compost, other than providing the necessary elements for plant growth, could improve the physiochemical structure of soil. This research was conducted to evaluate the growth traits, quantitative and qualitative yield, and constituents of essential oil of sweet majoram under the application of compost extract and inoculation of biofertilizers. The experiment was performed as split plot in time with three replications at Research Greenhouse of Ferdowsi University, Mashhad, Iran, in 2012. Main plots were 16 fertilizer combinations (*Azotobacter* (*Azotobacter paspali*), (B₁), *Azospirillum* (*Azospirillum brasilense*) (B₂), mycorrhiza (*Glomus intraradaices*) (B₃), 10% compost extract (C₁), 20% compost extract (C₂), 30% compost extract (C₃), B₁C₁, B₁C₂, B₁C₃, B₂C₁, B₂C₂, B₂C₃, B₃C₁, B₃C₂, B₃C₃ and control) and sub-plots were three cutting stages during the growing season. Results showed that height of main stem, dry and fresh weight of sweet majoram was significantly affected by single and combined application of biofertilizer inoculation and compost extract at the first cutting and were higher than the second and third cuttings. Also, the most significant increase in height of main stem, fresh and dry weight and essential oil content of sweet majoram (43.3 cm, 46.07 g/m², 27.11 g/m² and 0.89%, respectively) was observed in C₁B₃ treatment. Constituents of essential oil were significantly affected by single and combined applications of biofertilizer inoculation and compost extract. Among the constituents, terpinen-4-ol (18.01%) and *cis*-sabinene hydrate (15.4%) allocated the highest and ledene (15.4%) and camphene (0.01%) the lowest amount.

Keywords: Medicinal plant, Essential oil content, Organic inputs.

1. Agron. and Plant Breed. Dept., College of Agric., Ferdowsi Univ., Mashhad, Iran.

*: Corresponding Author, E-mail: khorramdel@um.ac.ir