

Effect of Mycorrhiza, Vermicompost and Chemical Fertilizer Application on Yield and Lawson Content of Henna as Medicinal Plant under Water Deficit Condition

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Abstract

In order to study the effect of biofertilizers, chemical fertilizers, and water deficit stress on biological yield, lawsone content, and root colonization with mycorrhiza in henna an experiment was conducted at research greenhouse of Bam University in 2014 and 2015 growing seasons. The treatments included fertilizers (without any fertilizer (F_1), humic acid (F_2), application of mycorrhizae and vermicompost (F_3), vermicompost (F_4), and chemical fertilizer (F_5) and water deficit levels (100% water requirement (I_1), 80% W.R (I_2), and 60% (I_3). The treatments were arranged as factorial in a randomized complete blocks design with fifteen treatments and three replications. Results showed that the highest weight of dry leaf, no. of leaves, and biological yield were obtained with application of mycorrhizae and vermicompost treatment under full irrigation (I_1F_3). With increasing stress severity, the highest weight of dry leaf (0.153g), no. of leaves (171), and plant height (120.33 cm) were obtained in I_2F_3 , largest number of nodules (63) in (I_2F_4), and maximum biological yield (5.21 g/plant), total lawsone content (69.6 mg/g), and colonization with roots (82.2%) was obtained with application of mycorrhizae and vermicompost treatment under 60% water requirement i.e. I_3F_3 treatment. It seems that biofertilizers can be considered as a replacement for chemical fertilizers in henna medicinal plant production.

Keywords: Biological yield, Colonization, Humic acid, Mycorrhiza, Vermicompost

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2- Lawsonia inermis