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Effect of Vermicompost, Mycorrhiza and Phosphate Biofertiliser Barvar-2 on Quantity and Quality Yield of Safflower (*Carthamus tinctorious* L.)

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Abstract

In order to investigate the effect of bio-fertilisers on quantity and quality yield of safflower, an experiment was carried out as factorial on a randomised complete block design with three replications at the Research Field Station of the Yasouj University, Faculty of Agriculture in 2016. The main factor included Vermicompost fertiliser at three levels (0, 5 and 10 tons ha⁻¹) and as sub-factor bio-fertilisers at four levels control, Arbuscular mycorrhiza (*Glomus mosseae*) at 80 kg ha⁻¹, 100 g Phosphate Barvar-2 ha⁻¹, and Arbuscular mycorrhiza + Phosphate Barvar-2.

According to the results, the interaction of vermicompost and bio-fertilisers had a significant impact on grain and oil yield. The highest grain and oil yield (2578 and 578 kg ha⁻¹, respectively) was obtained for the treatment of 10 tons of vermicompost ha⁻¹ combined with a combination of Arbuscular mycorrhiza + Phosphate Barvar-2. With increasing application of vermicompost from 0 to 10 ton ha⁻¹, the number of grains per head and per flower increased by 37 and 55%, respectively. Combined application of Arbuscular mycorrhiza and Phosphate Barvar-2 increased the number of grains per head (12 %), 1000 grain weight (7 %), flower yield (12 %) and oil yield (13 %). Mycorrhizal fungi and phosphate solubilising bacteria caused an increased supply of nutrients and photosynthetic materials, especially during grain filling stage and improved the amount of minerals stored in safflower grain. Vermicompost increased the concentration of elements in grain through its water absorption ability and the desired availability of nutrients. Finally, the use of 10 tons vermicompost ha⁻¹ combined with Arbuscular mycorrhiza + Phosphate Barvar-2 is recommended to produce suitable safflower grain and oil yield in this area.

Keywords: Biofertilisers, grain yield, protein percentage, sustainable agriculture