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Effect of Mycorrhizal and Fertiliser Phosphate Barvar 2 on Quantity and Quality Yield of Safflower (*Carthamus tinctorius* L.) under Drought Stress

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Abstract

In order to investigate the effect of bio-fertilisers on quantity and quality yield of safflower under drought stress conditions, an experiment was carried out as split-plot on a randomized complete block design with three replications in Marvdasht city of Fars Province in 2016. Main factor including: Drought stress in three levels (Control, drought stress at flowering and pollination stage and seed filling stage) and bio-fertilisers as sub factor were including (control, Phosphate Barvar 2, Arbuscular mycorrhiza, and Arbuscular mycorrhiza + Phosphate Barvar 2). Application of bio-fertilisers increased the grain yield components including number of per head, number of seeds per head and 1000-seed weight. According to the results, The highest grain yield (3321 kg ha^{-1}) was observed without drought stress and application of bio-fertilisers, arbuscular mycorrhiza and phosphate Barvar2 combined, and the lowest grain yield (1319 kg ha^{-1}) in drought stress at flowering stage without application of bio fertilizers was obtained. Drought stress at flowering and pollination stage reduced the grain yield of safflower. The highest seed oil was observed in normal irrigation with application of bio-fertilisers, and the lowest percentage of seed oil was battened at grain filling stage without application of bio-fertilisers. Drought stress on flowering and grain filling stages, significantly reduced seed and oil yield, and percentage of seed protein. Application of bio-fertilisers in drought stress conditions improved plant growth and yield. In general biological fertilisers application could alleviate drought stress adverse effects with root access due to increasing the efficiency of absorption and transport of nutrients and Mycorrhizal coexistence by providing the necessary conditions for the absorption of nutrients and water.

Keywords: Bio fertilisers, oil yield, safflower, seed yield, sustainable agriculture

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