

## **To investigate the effects of vermicompost, mycorrhizae and humic acid on qualitative and quantitative properties of Purple Conflower (*Echinacea purpurea*)**

Conflower (*Echinacea purpurea*) is a herbaceous perennial plant in the family Asteraceae. Its medicinal and ornamental values in the world cause it to become an important economic plant. Mycorrhizae fungi, special endomycorrhizae effects for better enhancement of immobile elements in roots in the most crop plants and the main role is to available better phosphorus. The main properties of Vermicompost are the function of enzymes, different microorganism and hormones in it. Vermicompost has been documented with various enzyme activities including protease, amylase, lipase, cellulose and chitinase that they have an effect role in the analysis of organic matters. The major advantage of humic acid is chelate complexes with ions such as Na, K, Mg, Zn, Ca, Fe and Cu in order to overcome the deformity of nutrients. We conducted the experiment base on organic agriculture, sustainable systems and health production. The design was factorial in randomized complete blocks with three replications. Treatments were Vermicompos in three levels (0, 2, 4 T/ha), Mycorrhizae in two levels (0 and 1.7 T/ha) and Humic acid in two levels (0 and 8 kg/ha). The result of analysis variance showed total yield (root+shoot) had a very significantly differences under the treatments of Mycorrhizae, humic acid and vermicompost. Comparison of means showed with use of Mycorrhizae and 4T/ha vermicompost total yield (root+shoot) was 5157.48 kg/ha. The most yield (root+shoot) (5.568 T/ha) is related to interaction three factors at last level treatments. The most Polyphenolic acids in the leaves (29.71mg/g. DW) were related to use of 4T/ha vermicompost without use mycorrhizae and humic acid. The most Polyphenolic acids in the roots (25.89 mg/g. DW) were related to use of mycorrhizae and 4T/ha vermicompost without use humic acid.

**Key words:** Vermicompost, Mycorrhizae, Humic acid and, Polyphenolic acids



University of Zabol  
Graduate School  
Faculty of Agriculture  
Department of Agronomy

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**Supervisor:**  
Dr. Alireza Sirousmehr

**Advisors:**  
Dr. Hamidreza Zabihi

**By:**  
K. Negari

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