Change in morphological properties of root and aerial parts of chickpea under drought stress, arbuscular mycorrhizal fungi and rhizobium treatments

S. Moradi[1]*, H. Besharati[2], V. Faizi-Asl[3] and J. Sheikhi[4]

(Received: 29 Dec. 2013 ; Accepted: 5 July 2015)

Abstract

To evaluate the effect of arbuscular mycorrhizal (AM) fungi (*Glomus mosseae* and *Glomus intraradices*) and *Mesorhizobium Ciceri* bacteria at three soil moisture levels [28% (field capacity, FC), 15% (-5 bar suction) and 9% (-10 bar tension) by weight] on morphological properties of root and aerial parts of chickpea, a greenhouse factorial experiment, arranged as a complete randomized design, was conducted in a sterilized soil. Results showed that moisture treatment had significance effect on number of pods, number of seeds, fresh and dry weight of root and aerial parts, plant height and root length and volume. Application of *Mesorhizobium* was effective on number of nodes, number of pods, number of seeds, fresh and dry weight of root and aerial parts, plant height, root length and volume. *Glomus mosseae* had significant effect on plant height. Interaction of moisture and AM fungi was significant on fresh and dry weight of root and aerial parts. Interaction effect of *Mesorhizobium* and soil moisture was only significant on number of nodes. In general, the highest fresh and dry weight of aerial parts (44.6 and 10.53 grams, respectively) was obtained by inoculation of chickpea by rhizobium bacteria and *Glomus mosseae* at FC moisture level, and AM fungi *Glomus mosseae* was more efficient compared to *Glomus intraradices* in both drought stress and without stress conditions.

Keywords: Live stress, Abiotic stress, Symbiosis, Biologic fixation.

1. Dept. of Agric., Payam-e-Noor Univ., Tehran, I.R. IRAN.
2. Agric. Res. Edu. and Exten. Org., Soil and Water Res. Inst., Karaj, I.R. IRAN.
3. Agric. Res. Edu. and Exten. Org., Dryland Agric. Res. Inst., Maragheh, I.R. IRAN.
4. Dept. of Soil Sci., Agric. and Nat. Resour. Complex, Univ. of Tehran, Karaj, Iran.
*: Corresponding Author, Email: 6341ms@pnu.ac.ir

[Downloaded from jspi.iut.ac.ir on 2024-10-12]

[DOR: 20.1001.1.20089082.1395.7.2.15.3]

[DOI: 10.18869/acadpub.ejgcst.7.2.179]