Effects of organic and chemical fertilizers and amendments residue of them on ecophysiologycal characteristics of Chamomile (*Matricaria chamomilla* L.) under drought stress conditions

Abstract

Management of organic and inorganic fertilizers application and residual of them are very important in their effect on environment and plant yield. In order to determine the effect of drought stress and different amendments on flower, essential oil and chamazulene yield and yield components of *Matricaria chamomilla* L., a study was conducted in split plot design with three replications during 2007 to 2009 at University of Zabol. Treatment included W1 (non stress), W2 (75% FC) and W3 (50% FC) as main plot and three kind of fertilizers: F1 (non fertilizer), F2 (chemical fertilizer), F3 (manure fertilizer) and F4 (compost) as sub plot that is used in the first year. Results showed that drought stress decreased quantitative and qualitative yield of German chamomile that were similar in both years. At the first year, chemical fertilizers enhanced yield and improved quality characteristics of plant. The maximum yield and its components, essential oil, chlorophyll, proline, N, P and K elements absorption and concentration were obtained from chemical fertilizer usage. Animal manure and compost had more quantity and quality of yield compared with control treatment. At the second year, animal manure and compost residue in compare with chemical fertilizer residue and control treatment had more quantity and quality of yield. The highest flower yield, essential oil, chlorophyll, proline, N, P and K elements absorption and concentration and yield components were obtained from organic fertilizers residual. The interaction effect of water stress and fertilizers showed that organic fertilizers improved quality and quantity of chamomile especially in severe water stress. Organic fertilizers -usage and their residue- enhanced macro elements in soil and improved soil structure and water holding capacity. Organic fertilizers had high using cost but they had more benefit in long term in compare to chemical fertilizers and it can be useful for farmers. In result, we can consider using of animal manure and compost in order to planting chamomile in Sistan region especially in drought conditions.

Key words: Amendments residue, Chamomile (*Matricaria chamomilla* L.), Drought stress, Ecophysiologycal characteristics, Fertilizer

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