

Abstract

To investigate the effects of drought stress and different levels of potassium fertilizer and experiment was conducted as split plot randomized complete block design with three replications. The experiment was carried out at Zabol University Research Farm during 2016. Treatments included drought stress in three levels, control (irrigation at 90% FC), moderate stress (irrigation at 70% FC), sever stress (irrigation at 50% FC) as the main factor and different amounts of potassium fertilizer in four levels (including no potassium application, 50, 100 and 150 kg of potassium fertilizer as potassium sulfate as sub-factor. Results showed drought stress and potassium fertilization has a significant effect on plant height, number of flowers per plant, fresh and dry weight of the plant, stem diameter, flower yield, number and diameter of main branches. In all of these traits irrigation at 90% FC was superior rather other treatments and drought stress reduced them. Among the levels of potassium fertilizer, the highest fresh and dry weight, plant height, stem diameter, head diameter, flower yield per plant, number of main stems, number of flowers per plant was observed at consumption of 150 kg potassium. Interaction between drought stress and potassium fertilizer was significant on plant height, flower yield per plant, and fresh weight of the plant. The results suggested that effect on the interaction of potassium fertilizer and drought stress in chlorophyll a, b, total potassium and carbon hydrate was significant and the highest effect was from 90% FC and 150 kg of potassium fertilizer. According to the results to achieve maximum quantitative and qualitative performance of essential oil yield, proline and carotenoids irrigation after 50% of FC and consuming of 150 kg of potassium fertilizer was suitable.

Keywords: Proline, Essential oil percentage, Leaf chlorophyll, Carotenoids, Crop Capacity



University of Zabol
Graduate school
Faculty of Agriculture
Department of Agronomy and Plant breeding

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**Effect of drought stresses and different
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Supervisors:
Dr. M. Ramroudi

Advisor:
Dr. M. Galavi

By
F. Jahanbani

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