Abstract

Garden *Thyme* has been one of the oldest medical plants under the use of human beings, and because of having much effective medical, superficial (cosmetic), hygienic and material, is classified as an important and a valuable plant. To investigate the effect of foliar application of salysilic acid and jasmonic acid on morphological and physiological traits of garden thyme under the drought stress, a split plot factorial experiment based on randomized complete block design with three replications, was conducted in the educational field research, located in sistan dam. The experiment treatments consisted of three levels of drought stress: %50 of field capacity irrigation, %70 percent of field capacity irrigation, %90 of field capacity irrigation. The foliar application of salicylic acid and jasmonic acid consisted of three levels. For salicylic acid, they were zero, three and six Mmolar and for jasmonic acid, they were zero, 250 and 500 micromolar. the foliar application salisylic acid and jasmonic acid were conducted in two seprate stages. Those features which can be evaluated are: plant height, root length, plant fresh weight, plant dry weight, grain performance, root dry weight, root fresh weight, the weight of one thousand seeds, biological function, essence percentage, essence weight (kg dry in the dry matter), chloroohyll A, chlorophyll B, the whole chlorophyll, carotenoid, carbohydrates, proline and anthocyanins. After harvesting, the biological function was calculated. And then, seeds were seprated and their performance was calculated. The results of drought stress on evaluating traits, showed that in most of the traits, drought stress cause the reduction of height, one thousand seeds weight, the number of side branches, grain performance, photosynthetic pigments, biological function, the dry and fresh weight of shoots, and the weight of essence. The drought stress also cause increasing the root length, the dry and fresh weight of root, amino acid, proline, the essence percentage, carbohydrate and peroxidase enzymes in the probability level of one percent. The results of drought stress, on anthocyanin and catalas, represented that their rates in the terms of mild stress 70, increased. But, in the terms of severe stress, this percentage showed a decreasing trend. Increased levels of foliar application of salisylic acid and jasmonic acid in most of the traits caused the increase of the traits, plant height, weight of one thousand seeds, the number of side branches, root length, grain performance, photosynthetic pigments,biological function, the dry and fresh weight of root, the dry and fresh weight of shoot, amino acid, proline, antioxidant enzymes, essence percentage, essence weight and the reduction of carbohydrates in garden thyme in the probability level of one percent.

Key words: garden thyme, *salisylic acid*, *jasmonic acid*, drought stress, foliar application

University of Zabol

Graduate school

Faculty of Agriculture

Department of Horticulture and Landscape

The Thesis Submitted for the Degree of M.Sc (Horticultural Plant Breeding)

Effects of salicylic acid and jasmonic acid on morphological and physiological traits of medicinal plant thymus vulgaris under drought stress (*Thymus vulgaris L.)*

Supervisors:

Dr. B. Fakheri

Dr. N. Mahdi nezhad

By: A. A. Ghaderi

22 September 2015