

Abstract

To investigate the effects of spraying of Nano- potassium chelated and iron- chelated on quantitative and qualitative characteristics of two cultivars of green and purple basil under drought stress a split plot factorial experiment in a randomized complete block design with three replications was conducted in Abade in 2015. The treatments of the experiment included three irrigation regimes 50 (severe stress), 70 (medium stress) and 90 (control) of field capacity as the main factor, green and purple basil cultivars were evaluated as a first sub and spraying of Nano- potassium chelated (in two levels zero and two in a thousand) and iron- chelated (in two levels zero and one in a thousand) as sub-agent second. Measured characteristics of include: plant height, internode length, inflorescence height, root length, number of lateral branches, number of inflorescence, leaf area index, fresh and dry weight Aerial part, chlorophyll a, b and total, carotenoids, carbohydrates, anthocyanin, proline, percent ash and organic matter, amount of potassium, sodium, iron and essential oil percent were. Results of this experiment showed that the simple effects of drought stress and cultivars on all traits and simple effects of fertilizer on some traits was significant. Interaction drought stress with cultivars on all traits and reaction drought stress and fertilizer on all traits was significant except for percent ash and organic matter. Also the mutual effects cultivars and fertilizer on plant height and fresh weight Aerial part at 5% level and amount of carotenoids, carbohydrates, proline, essential oil percentage and sodium were meaningful at 1% level. The trilateral interaction in morphological only on the number of inflorescence and physiological traits a significant effect on chlorophyll (a, b and total), carotenoids, carbohydrates, proline, essential oil percentage and iron ($p \leq 0.01$) and sodium ($p \leq 0.05$). The drought stress was decreases all parameters except root length, carbohydrates, anthocyanin, proline, Organic matter percent and percentage of the elements. Nano- potassium chelated was increased all parameters except proline. Also fertilizer (Nano-potassium chelated) was better in plant height, internode length, inflorescence height, root length, leaf area index, fresh and dry weight aerial part, chlorophyll (a, b and total), carotenoids, carbohydrate, essential oil percentage, ash, organic matter and potassium element relative to the iron chelate. But the impact of iron- chelated on number of lateral branches, number of inflorescence, proline, anthocyanin and Percentage of the elements sodium and iron was higher than Nano- potassium chelated. All the characteristics purple cultivar was better than the green but the percentage of organic matter and essential green cultivars was more than purple. So that the spraying of Nano- potassium chelated on green cultivar under moderate drought stress (70% FC), highest percentage of essential oils (746/0) was obtained. Spraying of iron- chelated and severe stress decreased the essential oil perception both cultivars. Although the essential oil percent on green cultivars (99.06) more than purple (89.91), but essential oil purple cultivars has a number of more compounds. The main Compound of the essential oil in both cultivars was Methyl chavicol respectively 60.81 and 46.56 percent of the essential oil in green and purple cultivars accounted.

Key words: essential oils, cultivar, Basil, drought stress, praline, leaf area index.



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Thesis Submitted in Partial Fulfillment of the Requirement for the degree of Master
of Science (M. Sc) in in Medicinal plant, Spices and Soda

Title:

**The effect of spraying of Nano- potassium chelated
and iron- chelated on morphological and
physiological traits of two varieties of (*Ocimum
basilicum*), under drought stress**

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Sep 2016