

## **Evaluation of yield and qualitative aspects of fennel (*Nigella sativa* L.) under drought stress and application of compost in Sistan**

### **Abstract**

Increasing in medicinal plants cultivation creates the need for correct management and planning. In order to evaluate the yield and qualitative aspects of fennel plants under drought stress and the application of urban waste compost, an experiment was conducted at the research farm of Zabol University. Main factors included irrigation treatments at three levels: control (no stress) irrigation at 6 days intervals, moderate drought stress irrigation at 9 days intervals and severe drought stress irrigation at 12 days intervals, and the sub-levels included compost application; Lack of compost application (control), application of compost at rate of 10 tons per hectare, application of compost at rate of 20 tons per hectare, and application of compost at rate of 30 tons per hectare. The results showed that compost significantly improves plant height, number of leaves per plant, number of capsules per plant, number of seeds per plant, biological yield, seed yield, seed weight, oil percentage, oil yield, proline, carotenoids, chlorophyll a, chlorophyll b, total chlorophyll, ash contents in seeds, organic matter in seeds, seed numbers, seed calcium, magnesium, nitrogen, phosphorus and potassium, concentration of P-cymene,  $\gamma$ -Terpinene, thymoquinone, the severity of the odor, taste and color of plants. Effect of different irrigation levels compared with control (no stress) significantly increased the biological yield and grain yield, harvest index, seed weight, oil yield, proline and chlorophyll a was significant. Results suggested that application of 30 ton compost per hectare of and non-drought attained the greatest grain weight (2.82 g), carotenoids contents (5.42), chlorophyll a (15.87), chlorophyll b (5.29) and total chlorophyll (21.16), Biological and grain yield (1498.6 kg per ha and 553.6 kg per ha, respectively). First level of irrigation (no stress) and application of 30 ton compost per hectare produced the greatest economic and biological yield. In conclusion irrigation at 6 days intervals along with application of 30 ton of compost per hectare is suitable for the production of fennel in Zabol region.

**Keywords:** herbs, Irrigation interval, organic fertilizers, Capsule



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