



دانشگاه زابل

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**Investigation the agronomic and physiological
characteristic of melon under drought stress condition
using animal manure and bentonit**

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Abstract

A large part of Iran is affected by arid and semi-arid climate and drought has caused many problems in the agricultural sector. The aim of the present study was to investigate the characteristics of melon under drought stress condition using animal manure and bentonit. This experiment was conducted as a split-factorial in the form of a randomized complete block design with three replications in Hirmand city during the two cropping years of 2019-2020. Irrigation levels after 25, 50, and 75% permissible soil moisture depletion as the main plot; and bentonite application (2, 3 and 4 tonnes per hectare); and domestic manure (20, 30 and 40 tonnes per hectare) were used as subplots. According to the results, the maximum fruit length (17 cm), fruit width (12.86 cm), total yield (2.20 t / ha), meat percentage (67.95%), total chlorophyll concentration (2.21 mg / g fresh weight), leaf carotenoid concentration (0.518 mg / g fresh weight), soil acidity (6.09) in the second year of experiment under 25% permissible soil moisture depletion using 4 tons in Hectares of bentonite and 40 tons per hectare of livestock manure were obtained. Also, the maximum root length (40.22 mm) with the application of 4 tons per hectare of bentonite, the maximum stem length (150.67 cm); In terms of application of 2 tons per hectare of bentonite and 20 tons per hectare of manure, the maximum stem diameter (18.75 mm) in terms of application of 4 tons per hectare of bentonite and 20 tons per hectare of livestock manure, the highest dry weight of stem (15.40 g) in terms of application of 3 tons per hectare of bentonite and 30 tons per hectare of fertilizer in the second year and in terms of 25% of the allowable soil moisture discharge was obtained. In addition, the highest leaf dry weight (26.44 g) and leaf area index (183.33 cm³) in the second year of the experiment under 25% permissible soil moisture discharge using 3 tons per hectare of bentonite and 40 tons per hectare Livestock manure was obtained.

According to the results, the highest relative moisture content of leaves (62.82%) in the second year of the experiment was observed in the conditions of 25% permissible soil moisture depletion and 2 tons of bentonite and 20 tons per hectare of manure. Also, the highest number of fruits per plant in the second year of the experiment (1.40) was obtained in the conditions of 25% permissible soil moisture depletion using 4 tons per hectare of bentonite and 40 tons per hectare of manure (1.68). Also, the highest fruit weight in the second year of the experiment (668.73 g) was obtained under 25% of the permissible soil moisture discharge using 4 tons per hectare of bentonite and 30 tons per hectare of manure (844.7 grams), but the maximum thickness Fruit peel (6.36 mm) was obtained in the first year of the experiment under 75% permissible soil moisture depletion using 2 tons per hectare of bentonite and 20 tons per hectare of manure. Based on the results, the highest percentage of seeds (21.49%) and chlorophyll b concentration (0.88 mg / g fresh weight) in the second year of the experiment under 50% permissible soil moisture discharge using 3 tons per hectare of bentonite and 40

tons Livestock manure was obtained per hectare. Also, the highest concentration of chlorophyll a (1.45 mg / g fresh weight) was obtained in the second year of the experiment under 25% permissible soil moisture depletion using 4 tons per hectare of bentonite and 30 tons per hectare of manure. In addition, the highest amount of proline (0.422 micromoles per gram of fresh leaf weight) in the first year of experiment and the highest soil temperature (31.65 ° C) in both years of experiment under 75% permissible soil moisture discharge and respectively 2 tons per hectare of bentonite and 20 tons per hectare of manure were obtained.

The results showed that the highest amount of glucose (3.63% by weight) in the first year of the experiment was obtained under 50% permissible soil moisture depletion and application of 2 and 3 tons per hectare of bentonite and 30 and 40 tons per hectare of manure, respectively. Also, the highest amount of fructose (1.78% by weight) in the first year of the experiment and the highest amount of tetracyclic acid (54%) in the second year of the experiment under 25% permissible soil moisture depletion and application of 3 tons per hectare bentonite and 40 tons per Hectares of livestock manure were obtained. In addition, the highest percentage of soluble solids (9.35%) in the conditions of 75% of permissible soil moisture depletion using 4 tons per hectare of bentonite and 30 tons per hectare of manure, respectively, and the highest activity of catalase enzymes (32.60 OD.g⁻¹.FW.min⁻¹) and peroxidase (4.15 OD.g⁻¹.FW.min⁻¹) in the first year of the experiment under 75% permissible soil moisture depletion and application of 2 tons per hectare of bentonite and 40 tons per hectare of fertilizer, respectively. An animal was obtained. In order to achieve the best results, irrigation after 50% of the permitted soil moisture discharge, the use of 4 tons per hectare of bentonite and 30 tons per hectare of manure for cultivation in the region is recommended.

Key Words: Moisture depletion, Supper absorbent, Fruit yield, Fructose, Ghandak zaferani