



ORIGINAL ARTICLE

EFFECT OF NANO-ZINC FERTILIZATION AND WATER STRESS ON WATER USE EFFICIENCY, GROWTH AND YIELD OF BROCCOLI IRRIGATED WITH SALINE WATER

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Abstract: A field experiment was conducted in Fallujah district /Anbar governorate in loamy sand soil during the autumn season 2021. To study the foliar application effect of nano and conventional zinc fertilizer and water stress on the growth and yield of broccoli, Zinc fertilizers were applied at three levels *i.e.*, 0 (control treatment), 20 and 100 mg/l, taking the symbols of Zn0, Zn1 and Zn2, respectively. The irrigation events were carried out by supplying 100%, 75 and 50 % of the net irrigation depth, taking the symbols of I1, I2 and I3, respectively. For each irrigation event, the allowable depletion was 40 % of plant-available water. The irrigation intervals were determined according to the class A evaporation pan. The experiment was conducted using two-factorial randomized complete block design with split-split plot arrangement with three replications. Zinc and irrigation levels were placed in the main and sub-plots, respectively. The parameters under study were water consumption, plant height, leaf area, total yield and water use efficiency. The results showed that the highest values of water consumption reached 400 mm season⁻¹ at I1 treatment (100% of the net irrigation depth). Nano-zinc fertilizer addition levels at a concentration of 100 mg L⁻¹ gave a significant increase in all traits under study, namely plant height, leaf area, total yield and zinc concentration in seeds, which reached 48.33 cm, 393 dm², 18.56 tons h⁻¹ and 26.65 mg Zn.kg⁻¹ soil, respectively. While the values of mean leaf area, total yield of broccoli and zinc concentration in seeds for irrigation level of 100% of the net depth of irrigation were significantly superior by giving 330 dm², 13.56 to. ha⁻¹ and 17.70 mg Zn kg⁻¹, respectively.

Key words: Nano zinc, Water stress, Broccoli, Water use efficiency.

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