EFFECT OF IRRIGATION LEVELS AND SILICON ON GROWTH AND FLOWERING OF SOME ANNUAL FLOWERS

By

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ABSTRACT

Two field experiments were conducted at the nursery and Experimental Farm of El- Qanater Elkhayria, Horticulture, Research Station, Qalubiya Governorate, Egypt, in cooperation with the Department of Horticulture, Faculty of Agriculture, Benha University, during the two successive growing seasons of 2017 and 2018.

This work aimed to investigate the response of Marigold (*Tagetes erecta* L.) and Zinnia (*Zinnia elgans*) seedlings grown under irrigation regime levels to foliar spray of different concentrations of potassium silicate on vegetative growth, root growth, flower yield and some chemical constituents. Results illustrated that the highest average values of Marigold vegetative, roots, flowering parameters, total carbohydrate % , chlorophyll a & b, carotenoids content and water use efficiency occurred in I_1 (25% ASMD) Available Soil Moisture Depletion followed by I_2 (50% ASMD). Whereas, the lowest average values were obtained under I_3 (25% ASMD) treatment, on the other hand, the water utilization efficiency was progressively increased with potassium silicate foliar sprays especially at 4.0 mll^{-1} in both seasons. The combined treatments between irrigation levels and potassium silicate sprays showed the maximum increment of all the above mentioned parameters in Marigold and the superior treatment was the level of high available moisture I_1 (25% ASMD) and sprayed with potassium silicate 4.0 mll^{-1}, while these values were minimum in Marigold at I_3 (75% ASMD) the lowest level of soil moisture and sprayed with distilled water (0.0 potassium silicate) in both seasons.

As for Zinnia, it could be concluded that I_1 (25% ASMD) and I_2 (50% ASMD) levels of available soil moisture greatly affected all vegetative, root growth, flowering, total carbohydrates % , chlorophyll a & b and carotenoids content without significant differences between them in the most cases and with superiorty of I_2 (50% ASMD) in some traits such as root growth parameters and furthermore, the highest values of the above mentioned parameters were obtained with 4.0 mll^{-1} potassium silicate treatment and with I_1 (25% ASMD) and I_2 (50% ASMD) which showed the maximum increment in water use efficiency in Zinnia and Marigold. Potassium silicate sprays could alleviate water stress.

Key words: irrigation regime, water utilization efficiency, potassium silicate.

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