

Impact of Gel Conditioners and Water Salinity on Intermittent Evaporation

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THE EFFECT of gel-forming conditioners and water quality on aggregation, relative swelling and evaporation for calcareous loamy sand soil were investigated. The treatments consisted of two waters: distilled and salt solution with $EC = 42.5$ dS/m and $SAR = 5.3$, and three conditioners (0.1% Hydrogel, 0.4% StaWet and 0.4% Jalma). Twenty two mm of water was applied every seven days for each column during 21 days of the experiment. The columns were placed in a walk-in growth chamber with controlled light of 25.7 W/m and constant temperature of 28°. The aggregation index was significantly increased by 13, 37 and 27% due to addition of 0.1% Hydrogel, 0.4% StaWet and 0.4% Jalma, respectively. For distilled water, gel conditioners gave relative swelling values about in the range of 3-23 times that of control. Whereas the salt solution, the relative swelling was much lower for these conditioners. For distilled water, the conditioners significantly ($p=0.05$) reduced cumulative evaporation. However, for the salt solution all conditioners gave significantly ($p=0.05$) higher evaporation values than that of the control during the first and second cycles and there was no significant difference in evaporation during the third cycle.

Key Words : Gel conditioner, water quality, calcareous soil evaporation.

Most of the agriculture soils in Saudi Arabia are calcareous, sandy and low in fertility status (Bashour *et al.*, 1983), irrigated with relatively medium to saline underground water (Al-Omran, 1987). These soils are characterized with low water holding capacity, high infiltration rate and high evaporation. The use of gelforming conditioners may alleviate some of the physical constraints and thus improve the water use efficiency in these soils. Gel-forming conditioners