EFFECT OF WATER STRESS ON WHEAT CROP USING NEUTRON SCATTERING TECHNIQUE

By

AMINA SAYED SAAD MOSTAFA

B.Sc. Agric. Sc. (Agric. Engineering), Ain Shams University, 2011.

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ABSTRACT

Amina Sayed Saad Mostafa: Effect of Water Stress on Wheat Crop Using Neutron Scattering Technique. Unpublished M.Sc. Thesis, Department of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, 2017.

A field experiment was conducted at the Experimental Farm of Soil and Water Research Department, Nuclear Research Center, Atomic Energy Authority, Egypt. The objectives of this study is to estimate water stress coefficient (K_s) and optimize the irrigation requirements of wheat crop (*Triticum Astivum L.*) variety Misr2 cultivated in semi-arid climate conditions under trickle irrigation system in sandy soil. The field experiment was conducted under four different irrigation water regimes, the treatments T_2, T_3 and T_4 received 80, 60 and 40%, respectively, of the irrigation applied in treatment T_1 which was 100% form recommended ET_c. The effect of the four water levels on wheat crop was investigated during the growing season where soil moisture content and depletion were monitored by neutron moisture meter. The results of this study showed that the crop evapotranspiration (ET_c) were 509.2, 407.4, 305.5 and 203.7 mm/season, while the total actual evapotranspiration (ET_a) were 441.90, 353.60, 262.20 and 179.10 mm/season for 100, 80, 60 and 40% treatments, respectively. Water stress coefficient (K_s), water use efficiency (WUE) and wheat yield were estimated and evaluated for all irrigation treatments. The maximum crop yield (4.48 tons ha^{-1}) presented at 0.92 (K_s) of T_1 with low value of WUE (0.88 kg m^{-3}), while the highest effect of K_s occurred in T_4 (0.74) with the lowest yield value (3.14 tons ha^{-1}) and highest value of WUE (1.54 kg m^{-3}).

Keywords: Evapotranspiration, Water stress coefficient, Neutron moisture meter, Wheat crop, Water use efficiency.

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