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Water-Use Efficiency (WUE) and Change in the Yield-Response Factor (Ky) of Cotton Irrigated by an Irrigation Drip System

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Abstract: This study was conducted to investigate the effect of water-use efficiency and changes in the yield-response factor of cotton irrigated with an irrigation drip system. The amount of water applied was based on free surface evaporation from a screened Class-A Pan. Irrigation treatments consisted of two different irrigation intervals (I1: 5; I2: 10 days), three plant-pan coefficients (Kcp1: 0.75; Kcp2: 0.90, Kcp3: 1.05) and two different soil surface wetting percentages (P1: 0.70 and P2: based on cover percentage of the crop). The first irrigation was applied when the available soil water content in the 120 cm of the soil profile was 40%. The results revealed that total water use efficiency (TWUE) and irrigation water use efficiency (IWUE) varied from 0.58 to 0.62 kg/da/mm and 0.755 to 0.94 kg/da/mm, respectively. The ratio of irrigation water measured to evapotranspiration (I/ET) was 67 - 72.5%. The seasonal Ky value of cotton was 0.70. It can be concluded that under similar climate conditions, relative irrigation efficiency values can be used for planning drip irrigation, and relative yield decrease in cotton against deficit irrigation water can be estimated by using the yield-response factor (1 - Y / Ym) = 0.70 (1 - ET / ETm).

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