

RESPONSE OF CORN (*Zea mays* L.) TO DEFICIT IRRIGATION AT DIFFERENT GROWTH STAGES.

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ABSTRACT

The main objectives of this study were to detect the response of corn to deficit irrigation practices at different growth stages of the crop , and to determine the crop water requirements under middle of Iraq conditions (Baghdad). Randomized Complete Block Design (R.C.B.D.) with three replications was applied to analyzed data. Corn was grown under five irrigation treatments . A control treatment(no water reduction) and four deficit irrigation treatments (reduction 30 % from applied water irrigation to the control treatment (Full irrigation) at main growth stages : (seedling T2 , vegetative growth T3 , flowering T4 and seed maturity T5). The amount of irrigation water required was estimated based on measurement of soil water content by using gravimetric method , to moistening the 0-20 cm from planting up to the vegetation stage , 0-30cm from vegetation stage to the flowering, and 0-40cm from flowering stage up to the end of the growing season. Actual evapotranspiration was estimated by measuring the soil water content after each irrigation and before the next irrigation during the entire growing season. Reference evapotranspiration was estimated from atmometer gauge . Crop factor (K_c) , yield response factor (k_y) , plant height , leaf surface area , leaf area index , dry matter , grain yield were estimated. The result showed that The reduction in actual evapotranspiration for deficit irrigation treatments were 6.0 , 11.8 , 10.7 and 7.5 % at seedling , vegetative growth , flowering and seed maturity , respectively in comparison to full irrigation treatment . In general , K_c values increased with progress of season, and reached to highest value at flowering stage , then decreased at seed maturity . On other hand , found same behavior in deficit irrigation treatments with notice decreasing value of factor at growth stage that subjected to water stress . The crop response factor (K_y) was affected by deficit irrigation . The K_y values were 0.42 , 1.96 , 0.32 and 0.13 for deficit irrigation at seedling , vegetation growth , flowering and seed maturity stages, respectively. This means that the vegetative growth stage is more sensitive to deficit irrigation than other stages . There is no significant differences in grain yield between the control treatment and deficit irrigation treatments at seedling , flowering and seed maturing stages , their relative yield reached 96-99 % from control treatment This result pointed that stages are low sensitive to water stress . The other plant properties were take similar pattern of those for the grain yield .

Key words: Corn , deficit irrigation .