EFFECT OF SOIL MOISTURE STRESS AND FOLIAR APPLICATION OF ZINC ON SOME MAIZE VARIETIES

I. Growth Measurements

BY

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ABSTRACT

This study was carried out to determine the effect of the combination of three levels of available soil moisture stress (40,60 and 80% ASMD), three maize cultivars (T.W.C. 310, Karnak and Giza 2) and three levels of zinc sulphate as foliar application (0.0.3% 0.6% $ZnSO_4$) on growth characters. Three field experiments were conducted at Sakha Agricultural Research Station, Kafr El-Sheikh Governorate, Egypt in 1988, 1989 and 1990 seasons. The experimental design was split-split plot with four replications. The results were summarized as follows:

The average values of dry weight, leaf area/plant and leaf area index at 60,75 and 90 days from planting, the percentage of ears at 90 days after sowing, chlorophyll a, carotenoids, crop growth rate, net assimilation rate, plant height, ear height and stem diameter were significantly decreased by increasing soil moisture depletion from 40 to 80% in combined analysis over three seasons. There was a significant delay of silking time by increasing soil moisture depletion.

T.W.C. 310 cultivar surpassed significantly Giza 2 and Karnak cultivars in dry weight/plant at 60, 75 and 90 days from sowing, the percentage of stem, leaf area/plant and leaf area index at 75 and 90 days after sowing, crop growth rate, plant height, ear height and stem diameter. Karnak cultivar gave the highest for the percentage of leaves at 75 and 90 days from sowing, chlorophyll a and number of days to 50% silking. Giza 2 cultivar surpassed significantly the other cultivars in the percentage of ears and stem/plant at 75 and 90 days from sowing time.

The mean values of dry weight at 90 days from sowing, leaf area/plant and leaf area index at 60 and 75 day after sowing and stem diameter significantly increased by increasing the level of zinc sulphate up to 0.3%, whereas the number of days to 50% silking significantly decreased by application zinc sulphate as foliar up to 0.3%.

T.W.C 310 cultivar with irrigation at 40% depletion in available water or with applied 0.3% $ZnSO_4$ gave the highest percentage of stem, chlorophyll a and the ratio of chlorophyll a+b. The interaction between water strees, cultivars