University of Baghdad

FOLIAR APPLICATION OF MANGANESE AND BORON EFFECTS IN GROWTH AND YIELD OF MAIZE (Zea mays L.) UNDER DIFFERENT WATER CONSUMPTION RATIOS .

A Dissertation

By

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ABSTRACT

This experiment was conducted in field of Agriculture Department Baquba in spring season 2011 to study the water stress by using foliar application concentrations of each boron and Manganese. The experiment used maize seeds (Zea mays L.) cultivar 5012.

Split-Split plot Design as RCBD of three replicates was used in this experiment .(0, 25, 50) mgMn.l^{-1} added as Mn-EDTA(13%Mn) of spraying manganes and three concentration of spraying boron (0 , 2 , 4) mgB.l^{-1} as boric acid (17.4%B) and three periods of irrigation after(25,50,75%) of available water . Folair fertilizer were applied at three times during of plant growth .

Results and conclusions drawn from these experiments are summarized as follows:

1. Plant height ,leaf area, vegetation dry wt., chlorophyll content, proline, WUE increased with the increase in Manganese concentrations (using the therd level of Manganese sprayed 50mgMn. L^{-1}) (%16.06%, 26.98%, 49.36%, 11.73%, 97.00%, 47.59%) compared with control treatment. Element concentration in plant leaves (Mn,B,N andK) , Grain yield , weight of 1000grain, protein yield and biological yield increased with the increase in Manganese concentrations (using the therd level of Manganese sprayed 50mgMn. L^{-1}) (69.75%, 14.90%, 39.02% ,%44.36 ,100.03%, 14.29%, 58.10%, 50.9%) compared with control treatment.

2. Concentration at level 4mgB.L^{-1} gave highest percentage on vegetation growth rate which increaseing plant height, leaf area , vegetation dry wt., chlorophyll content, water content in leaves and WUE (6.71%, 13.01% , 17.78% , 7.30% , 14.89% , 18.16%) compared with 0mgB.L^{-1}. Concentration (B , N , K) in plant leaves , grain yield , weight of 1000 grain and biological yield increased with the increase in boron concentrations (using the therd level of boron sprayed 4mgB. L^{-1}) (46.62% , 7.42% ,17.51% , 97.42% ,5.65% , 19.09%) compared with 0mgB.L^{-1}.

3. Significantly increased in plant yield quantity and quality by using the interaction of manganese and boron especially high rate (Mn50 + B4) mg. L^{-1} the increase on plant height, leaf area , vegetation dry wt., chlorophyll content and WUE (, 22.94% , 43.58% ,84.61 % , 19.04% ,

71.55% , 83.69 %) compared with (Mn0 + B0) mg. L^{-1} .Concentration at level (Mn50 + B4) mg. L^{-1}gave highest percentage on Concentration (Mn, B , N , K) in plant leaves , grain yield , weight of 1000 grain and biological yield(71.57% , 48.75% , 74.46% , 71.55% , 18.98% , 79.73%) compared with (Mn0 + B0) mg. L^{-1} .

4. The varieties differ significantly between Manganese levels and water strees levels in most of characters. The interaction of therd level manganese sprayed (50)mgMn.l^{-1} and water stress (W3) were significantly influenced by interaction between of manganese sprayed (50)mgMn.l^{-1} and water stress (W3) especially in plant height, leaf area , vegetation dry wt., chlorophyll content, proline, WUE, concentration (Mn, K) in plant leaves grain yield , weight of 1000 grain and biological yield (6.06% , 29.23% , 41.09% , 8.53%, 97.11% , 54.73% , 75.53% , 39.64% , 105.34% , 18.45% , 47.49%) compared with (Mn0 mg. L^{-1} +W3).

5. Plant height, leaf area , chlorophyll content, water content in leaves, and concentration (B , K) in plant leaves and grain yield and weight of 1000 grain increased by interaction between (4mgB.L^{-1} + W3) compared with (B0 mg. L^{-1} +W3) .

6.Also, most of characters were significantly influenced by interaction between moisture levels x Manganese and boron concentrations .