

**RESPONSE OF
CULTIVARS
OF SUGAR CANE
Saccharum officinarum L.
TO DIFFERENT LEVELS OF
NITROGEN AND BORON IN MISAN**

DISSERTATION
SUBMITTED TO THE COLLEGE OF
SCIENCE OF THE UNIVERSITY OF
BAGHDAD IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE
OF PHILOSOPHY DOCTORATE OF SCIENCE
IN BOTANY

BY
YOUSIF NAEEM HAMED
February 2000

SUMMARY

Field experiment was conducted in the farm agriculture experiment of Misran State Sugar Enterprise in the spring of 1998, to study the effect of three cultivars (My5465, Co527, Co845), four levels Nitrogen fertilizer (zero, 200, 300 and 400 kg N/ha) and four levels of Boron fertilizer (zero, 0.5, 1.0, and 1.5 kg B/ha) on some growth characteristics, yield, chemical composition, juice of cane and N, Mg, Ca, K, P and B concentration in leaves of sugar cane. The experiment was designed according to split-split plot design (cultivars in main plots, nitrogen in split plots and boron in split-split plots) with four replicates. The data obtained was statistically analysed and the comparisons between the treatment using Duncan multiple range at (5%) level of significant.

The results can be summarized as follows :-

- 1- Stem height, stem weight, number of leaves/ plant, number of dead leaves on stem at harvest, cane yield, sucrose yield, % purity of juice, %brix of juice, %pol of juice, %Fiber and N, Mg, Ca, K and B concentration in leaves were high in cultivar My5465 comparing with cultivars Co527 and Co845; while cultivar Co527 was high in P concentration in leaves comparing with cultivars My5465 and Co845. There were no significant effect on the number of tillers / plant between My5465 and Co527 but higher than cultivar Co845, here cultivar My5465 was the best in high production of cane and sucrose.
- 2- The application of 400 kg N/ha increased the stem height, stem weight, number of leaves plant, number of tillers/ plant, cane yield , sucrose yield, %Purity of Juice, %Brix of Juice, %Pol of Juice and N, Mg, Ca, K, P and B concentration in leaves compared with zero , 200 and 300 Kg N/ha ; while the

percentage of fiber in cane and number of dead leaves on stem at harvest were decreased by nitrogen application, here application of 400 Kg N/ha was the best in high production of cane and sucrose.

3- The application of 1.5 Kg B/ha increased the stem height, stem weight, number of leaves plant, number of tillers/plant, cane yield, sucrose yield, %Purity of Juice, %Brix of Juice, %Pol of Juice and N, Mg, Ca, K, P and B concentration in leaves compared with zero, 0.5 and 1.0 Kg B/ha ; while the percentage of fiber in cane and number of dead leaves on stem at harvest were decreased by boron application .

4- The effect of the interaction between cultivars and the levels of nitrogen fertilizer was significant on the following characteristics:-

Stem weight, number of leaves /plant, number of tillers/plant, cane yield, sucrose yield, %purity of juice, %brix of juice, %pol of Juice, percentage of fiber in cane and N, Mg, Ca, K, P and B concentration in leaves. The application of 400 Kg N/ha to cultivar My5465 gave the best of cane yield and sucrose yield in quality and quantity.

5- There were significant interaction between cultivars and the levels of boron fertilizer on the stem weight, number of dead leaves on stem at harvest, sucrose yield, %Brix of Juice, %Pol of Juice and N, Mg, Ca, K, P and B concentration in leaves. The application of 1.5 Kg B/ha of cultivar My5465 gave the best characteristics.

6- The interactions between the levels of nitrogen and levels of boron fertilizer were significant on stem weight, number of leaves plant, number of dead leaves on stem at harvest, sucrose yield, %brix of juice, %pol of juice and N, Mg , Ca , K , and B

concentration in leaves . The application of 400KgN /ha and 1.5 KgB / ha gave the higher effect on this characteristics .

7- The effect of the interaction between cultivars and the levels of nitrogen fertilizer and the levels of boron fertilizer was significant on stem weight, sucrose yield, %purity of juice, %brix of juice , %pol of juice and N , Mg , Ca , K, P and B concentration in leaves . The application of 400Kg N/ ha and 1.5 Kg B / ha of cultivar My5465 gave the best results on sugar cane.

8- It can be concluded from this study that the application of 400Kg nitrogen/ha and 1.5 kg boron / ha gave the best results concerning the characters of quality and quantity of cultivar My5465 sugar cane under the conditions of this experiment in Misan.