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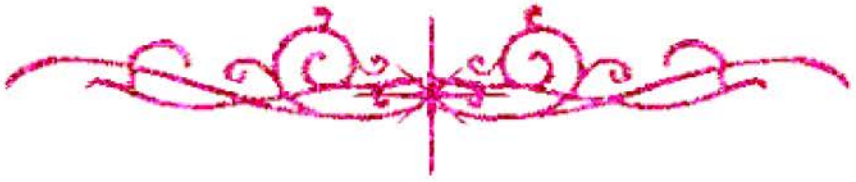

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STUDIES ON THE RESPONSE OF ROSELLE PLANTS TO DIFFERENT NITROGEN FERTILIZERS IN CALCAREOUS AND SANDY SOILS.

BY

MOHAMED ALI MAHMOUD

B. Sc. Agric. (Soil) Assuit Univ., 1989

A thesis submitted in partial fulfillment

of

the requirements for the degree of

MASTER OF SCIENCE

in

Agriculture

(Soil Science)

Department of Soil Science

Faculty of Agriculture

Ain Shams University

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ABSTRACT

Mohmed Ali Mahmoud "Studies on the Response of Roselle Plants to Different Nitrogen Fertilizer in Calcareous and Sandy Soils" Published for Master of Science,Ain Shams University,Faculty of Agriculter ,Department of soil,1997.

This work aimed to study the effect of different nitrogen sources and row spacing on the growth and productivity of roselle plants (*Hibiscus sabdariffa* L) cultivated under the conditions of calcareous and sandy soils in the Newly reclaimed lands of Egypt .A feild experiment was carried out in two different locations representing Newly Reclaimed lands in the west desert of Egypt (Nobaria and Wadi El-Natron) in comparison with the old cultivated lands in the Nile Valley (Giza). The experiment included nine treatments wich were the combination between three nitrogen forms (urea, ammonium nitrate and ammonium sulfate) and three row spacing (45, 60 and 75 cm). The irrigation system used in both Nobaria and Wadi El-Natron was the centtral spraying system (pivot system). Another experiment has beeen carried out in Wadi El-Natron in 1994 included two irrigation methods (drip irrigation and pivot system) and two selected row spacing (45 and 75 cm). The desigen of the experiment was split plots with four replications.

The effect of different nitrogen sources was significantly only on the dry weight of leaves (g/plant) at maturity stage in sandy soil in 1993, wich the heaviest dry weight was obtained with application of urea.In the second season ,the nitrogen forms had an effect on plant height in both soils, dry weight of stem (g/plant) ,number of fruits per plant ,weight of dried sepals and seeds (g/plant) in Wadi El-Natron. Application of ammonium nitrate gave the tallest plants, the highest number of fruits, the heaviest dry weight of sepals and seeds (g/plant). Cultivation at 60 cm between rows in both soils significantly increased dry weight of sepals (g/plant) in1993. In the second season ,increasing spacing between rows from 45 to 60 cm increased the dry weight of

sepals (g/plant) with 38% and50% in Wadi El-Natron and Giza ,respectively. Cultivation at wide spacing resulted in an increment in seed yield (g/plant). The effect of different nitrogen sources was significant only on fibers yield (kg/fed.) in Nobaria in 1993. Ammonium nitrate significantly increased the fibers yield (kg/fed.) comparing to urea and insignificantly comparing with ammonium sulfate. IN the second season (1994) ,the results indicated that nitrogen sources significantly affected the sepals yield (kg/fed) in both soils. Ammonium sulfate was superior than other two sources of nitrogen in sandy soil, while application of ammonium nitrate produced the highest sepals yield (kg/fed.) in clay loam soil. Anthcyanins yield (kg/fed) showed the same trend as that observed with sepals yield (kg/fed.). Seeds and oil yields (kg/fed.) were significantly affected with different nitrogen sources in both soils in 1994. Increasing distance between rows increased the sepals yield (kg/fed.) in both soils in both seasons. Anthocyanins yield (kg/fed.) increased with increasing row spacing from 45 to 60 cm in both soils and tended to decrease from 60 to 75 cm in 1993 .Widing row spacing up to 75 cm increased anthocyanins yield (kg/fed.) in both soils in 1994. The maximum seeds and oil yields (kg/fed.) were obtained from cultivation at row spacing of 75 cm in both soils in both seasons. Widing row spacing significantly decreased the fiber yield (kg/fed.) in both soils in both seasons. Drip irrigation methods significantly increrased seeds,anthocyanins and oil yields (kg/fed.) by 12.4, 12.2 and 10. 4% respectively over pivot system methods .

Key Words : Nitrogen fertilizer, Row spacing, Irrigation methods, (*Hibiscus sabdariffa* L.) Roselle.