

PHYSIOLOGICAL ASPECTS AND FEEDING VALUE OF FODDER BEET GROWING UNDER DIFFERENT IRRIGATION INTERVALS AND NITROGEN FERTILIZER LEVELS

By

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ABSTRACT

Two field experiments in two successive seasons of 2009/2010 and 2010/2011 were conducted in the Experimental Farm of Environmental Agricultural Science Faculty, El-Arish, Suez Canal University, North Sinai Governorate. This study focuses on response of two fodder beet cultivars (Rotta & Voroshinger) to three potassium fertilizer levels ($K_1=50$, $K_2=75$ & $K_3=100$ Kg K_2O /fed.) and four nitrogen fertilizer rates ($N_1=60$, $N_2=90$, $N_3=120$ & $N_4=150$ Kg N/fed.). The experimental unit area was 20 m^2 (=1\210 fed.) containing 4 rows of 10 m length (50 cm between rows x 25 cm between hills). Drip irrigation system was used. Polyethylene pipes 16-mm in diameter having 4 liters per hour were used for drip irrigation. Water salinity was ranked between 3500 and 4100 ppm. Soil texture of the cultivation site was sand loamy containing 0.28 meq/L of K^+ and with pH 8.3. Seeds were sown at a rate of 3 Kg/fed. at 25th Oct. and 5th Nov. in the first and second seasons, respectively. Superiority of top and root yield was observed for Rotta cultivar. Increasing potassium rates up to 100 Kg K_2O /fed. gave higher LAI and LAD at all sampling dates as compared with lower or higher studied rates. Increasing nitrogen fertilizer rate from 60 up to 120 Kg N/fed. increased NAR and top CGR at most of growth periods in both seasons. Leaves photosynthetic pigments responded significantly to doubling K-levels and increasing nitrogen up to 150 Kg N/fed.

Concerning to this study, fodder beet could survive and responded physiologically well to water salinity and poor sand fertility which reflected on economic forage yield of top and root. For achieving this goal, we could recommend planting Rotta cultivar with fertilizing by 120 Kg N/fed and 100 Kg K_2O /fed. under semi-arid region conditions of North Sinai and similar areas.

Key words: Fodder beet, potassium fertilizer, nitrogen fertilizer, top and root yield, leaf area duration, leaf area index, net assimilation rate, crop growth rate, chlorophyll a and b.