شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

STUDIES ON THE EFFECT OF MID- TO LATE SEASON DROUGHT AND POTASSIUM FERTILIZATION ON WATER RELATIONS AND YIELD OF SUGAR BEET CROP AT NORTH DELTA

By

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Introduction

I. INTRODUCTION

Sugar beet is the main crop for sugar production in Nile Delta region. It has become one of the major winter field crops in Egypt due to its high income to the farmers. Sugar beet can be irrigated with one fourth of the water used by sugar cane which considered the other source for sugar production around the world.

Most researches concerning water use by sugar beet crop showed that, in irrigated areas, early light irrigations are needed to assure seed germination to establish and maintain a good stand with vigorous early growth. Soil water during mid-season should be maintained at a favourable level to allow sufficient top growth and maintain leaf turgidity so as not to restrict the photosynthetic process, (**Jensen and Erie, 1971**). However, sugar beet have been credited with a rather wide range of response to mid and late season drought stress. **Carter *et al.* (1980)** showed that use of mid to late season deficit water management could substantially reduce sugar beet production costs in irrigated areas and economically benefit the consumer, producer and manufacturer.

Potassium fertilization for sugar beet crop became indispensable particularly in northern Delta soils (**Genaidy, 1988**). Potassium play an important role to overcome the high concentration of sodium which has a deteriorating effect on root quality of sugar beet. The influence of K on sugar accumulation in sugar beet is a function of its role in several individual biochemical and biophysical processes. It directly and indirectly affects photosynthesis, movement and utilization of assimilates, water transport, and osmoregulation turgor, the combined effects of which are manifested in both crop yield and quality. Therefore, sugar beet, in

common with other carbohydrate-producing root crops, has a high K requirement. This requirement is characterized by rapid uptake of K mainly during the period of foliage development and expansion by highly mobile subsequent distribution between the foliage and the storage roots (**Herlihy, 1989**).

The current study was carried out to study the effect of drought period at mid-to late growing season of sugar beet crop on its yield, quality and water relations. Consequently, to detect when irrigation should be terminated before harvest. Also, studding the effect of potassium fertilization under such conditions on yield and quality of sugar beet in none saline and saline alkaline soils.

Review of Literature

2. REVIEW OF LITERATURE

2.1. Effect of drought stress on sugar beet:

2.1.1. Water relations:

Winter (1980) studied the suitability of sugar beet for limited irrigation in a semiarid climate. Irrigation treatments were composed of three week interval which was used as an arbitrary standard to represent what is considered to be a good management practice. Two additional treatments using the basic three week interval were included for comparison. The obtained results showed that sugar beet has made efficient use of available water even while subjected to an extended periods of drought stress. Irrigation scheduling had a considerable influence on the efficiency of seasonal applied water for irrigation. Seasonal water use efficiency was the highest where water application was adequate to maintain a nearly full canopy with no periods of major water stress or excessive water. He also concluded that water is more efficiently used if stress periods can be distributed over the growing season, so that several periods of light stress occur rather than fewer periods of more sever stress.

Ghariani (1981) reported that as water stress develops, actual water use was declined in relation to the potential rate of use by an unstressed crop. The rate of the decline depends on how quickly and how far the demand (evapotranspiration) outstrips the supply (rain, irrigation and available soil water). The decline in water use would have been even more sever because the soil had not held a large amount of available water at the start of the growing season.