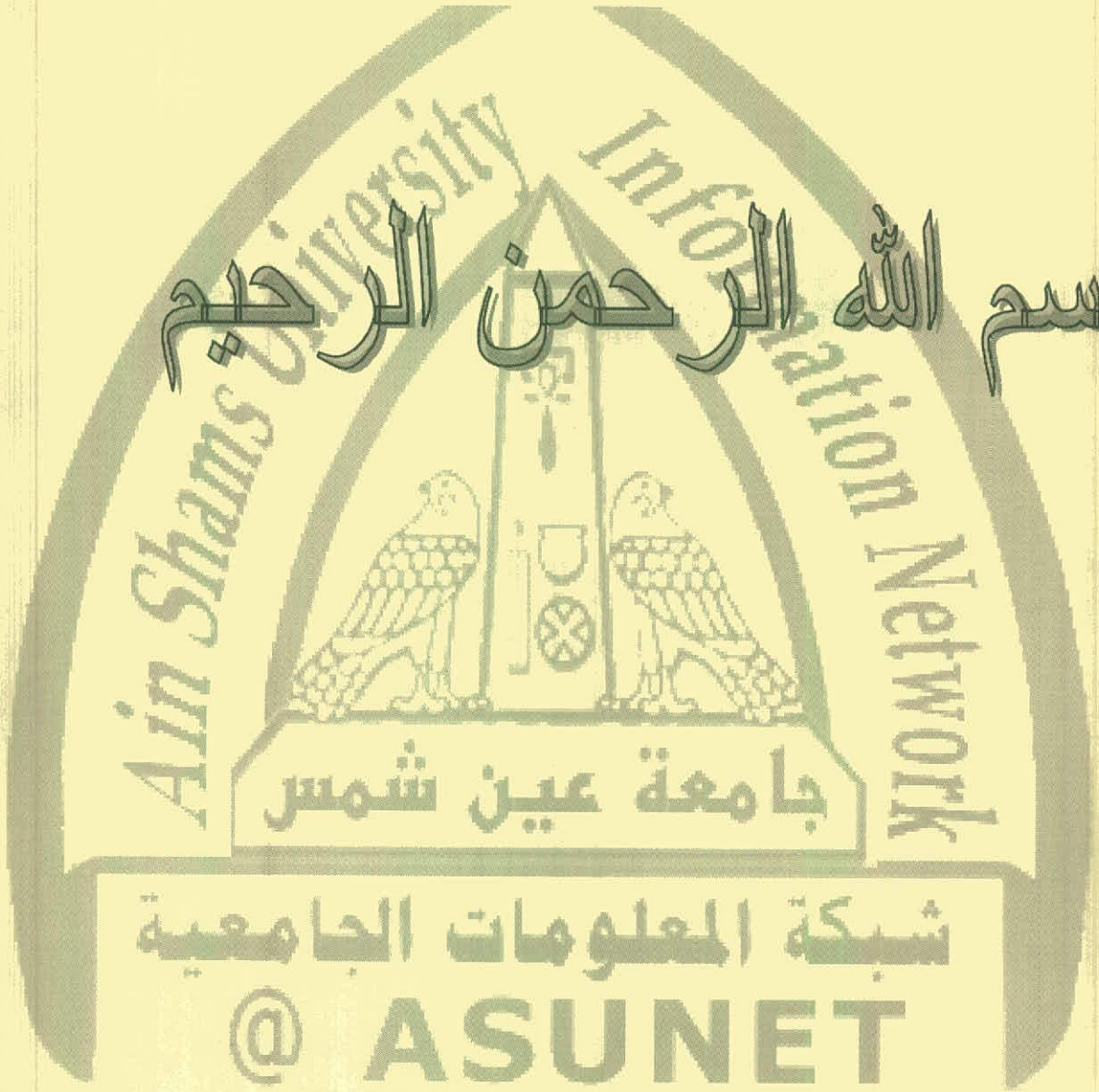

شبكة المعلومات الجامعية




# بسم الله الرحمن الرحيم


# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

## يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

**To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%**

Ain Shams University Information Network
شبكة المعلومات الجامعية
ASUNET

# بعض الوثائـــــــق الاصليـــــة تالفـــة

Ain Shams University Information Network
جامعة عين شمس
شبكة المعلومات الجامعية
@ ASUNET

# بالرسالة صفحات لم ترد بالاصل

# EFFECT OF WEED CONTROL ON GROWTH AND YIELD OF SUGAR BEET

By

*Ahmed LotfyAL- Moghazy*

B. Sc. (Agric.) Tanta University, 1994

٥٤١٣

**THESIS**

Submitted in partial fulfillment of the
Requirements for the Degree of
Master of Science

**In**

**AGRONOMY**

Faculty of Agriculture
Kafr El-Sheikh, Tanta University

**( 2000 )**

# EFFECT OF WEED CONTROL ON GROWTH AND YIELD OF SUGAR BEET

**By**

***Ahmed Lotfy Al-Moghazy***

B. Sc. (Agric.) Tanta University, 1994

**THESIS**

Submitted in partial fulfillment of the
Requirements for the Degree of
Master of Science

**In**

**AGRONOMY**

Faculty of Agriculture
Kafr El-Sheikh, Tanta University, 2000.

***Approved by :***

S. Abou-Khadrah

Sh. A. Shaban

S. Gh. R. Sarsour

M. H. Ibrahim

***(Committee in charge)***

**Deposited in the Faculty Library :**

Date Librarian

# ACKNOWLEDGEMENT

I would like to express my deep appreciation to **Prof. Dr. S.H. Abou Khadrah**, Professor and Head of Agronomy Dept., Faculty of Agriculture, Tanta University for supervision, guidance and continuous valuable consulting.

I am highly indebted to **Prof. Dr. Sobhy. Gh. R. Sorour** Professor of Agronomy, for supervision, encouragement and kind criticism during the preparation of this dissertation.

My sincere and deep gratitude to **Dr. E. El-Moghazy** Associate Prof. of Agronomy for supervision and great help and guidance.

Special appreciation to my parents, my brother for their valuable assistance and kind support.

Sincere thanks are also, due to all staff members of Agronomy dept. Fac. of Agric., Kafr El-Sheikh, Tanta Univ.

# CONTENTS

# INTRODUCTION

# 1NTRODUCTION

Weeds have been a major problem in sugar beet since crop was first grown in the late 1700s. At the end of the eighteenth century, **Achard (1799)** was already stressing the need to control weeds before the crop was sown. He also noted that once sugar beet was clear of competition from early-emerging weeds it would grow vigorously and smother weeds that germinated later. Modern weed control recommendations are still based on Achard's observations that sugar-beet plants need to gain an advantage over weeds early in the season. Although tractor hoeing and hand labour are still used in many production areas, herbicides have been the primary method of weed control in sugar beet since the early 1950s (**Schweizer and Dexter, 1987**).

Losses in root and sucrose yields due to weed competition depend on the competitive ability of prevailing weed species, weed density and time and duration of weed competition. Studying and definition of such relations between weeds and the crop represent main goals for researchers and agronomists to develop effective weed control measures in order to minimize weed competition and optimize crop production.

This investigation was carried out to study the effect of some weed control treatments on growth, yield and quality of sugar beet and a ssociated weeds.

# REVIEW OF LITERATURE

# REVIEW OF LITERATURE

## I. Effect of interference of weeds on sugar beets :

### A. On growth of sugar beet plants :

**Pozsgai (1984)** examined the effect of *Amaranthus retroflexus* and *Chenopodium album* at various plant densities on the quantity and quality of sugar beet yield to determine the competition index of the 2-weeds and found that, the critical density of the weed spp. was 2.3/$m^2$. During the early stages of sugar beet growth *C. album* caused greater competitive damage than *A. retroflexus*. But this difference gradually decreased as the vegetation period progressed

**Lorena and Gamboa (1985)** showed that weed weight was negatively correlated with the number and weight of marketable sugar beet roots and positively correlated with the non-marketable roots. The unweed plot had 31% lower weight of total roots and 41% lower weight of marketable roots than weed free plot.

**Farahbakhsh and Murphy (1986)** found that *Avena fatua* competition caused significant loss in the growth of beet plants.

**Schaufele (1986)** found that after singling a uniformly developed sugar beet stand, young *Chenopodium album* plants were planted between alternate sugar beet plants in every $6^{th}$ row, other weeds were removed, and crop and weed growth was measured at weekly intervals. Compared with values in row 1.5 m from those containing weeds, average individual root weights were reduced by 2 and 8% in rows 1.0 and 0.5m from the weed-infested rows and by 19% in the weed infested row. There was a

close relationship between the degrees in light intensity caused by the weeds and sugar beet root weight.

**Kropff *et al.* (1987)** found that, 5.5 *Chenopodium album* plants /$m^2$ and 11 Clumbs *stellaria media*/$m^2$ reduced sugar beet dry matter by 37% and 21% respectively. Although, *S. media* populations had a much higher LAI., *C. album* proved the stronger competitor and grew taller than the crop.

**Pozsagi (1988)** showed that weed competition reduced sugar beet growth rate particularly LAI.

**Villarias (1992)** Demonstrated that the most problematic weeds for sugar beet, which appeared in the majority of countries surveyed were *Amaranthus spp.*, *Chenopodium album*, *Solanum nigrum*, *Sinapis arvensis* and *Polygonum spp.*.

**Ferrero (1993)** found that, the population density of *Chenopodium album* in weedy plots reduced naturally from 106 to 65 plants/plot ($12m^2$) in the first 40 day. Its growth was affected by the time of crop emergence, a biomass and height 48 and 45% lower, respectively, than weeds that emerged at the same time as the crop.

**Gutierrez and Mulero (1993)** reported that generally the weeds emerge before the crop on dry and after the crop on irrigated land. Also, found that, the critical period for weed competition was from the 2 -to 16-leaf stage in dry land sugar beet and from the 4 - to 6 - leaf stage in irrigated sugar beet.

**Ivashchenko (1993)** found that *Amaranthus retroflexus*, *Chenopodium album* and *Agropyron repens* resulted in the greatest reductions in the mean weight of sugar beet plants and secretions of

*Amaranthus retroflexus* and *Chenopodium album* also caused the greatest reductions in sugar beet root weight.

**Abo El-Kheir (1996)** reported that, LAI correlated negatively with the density of weed infestation. The lowest values of root fresh weights produced from the unweeded control followed by applying herbicides or intercropping fenugreek with beets plants.

**B. On yield and quality :**

**Matushkin (1981)** showed that, root yields were decreased by 1.8-2.5 ton/ha in the presence of 1.0 tons/ha of fresh weight of weed depending on their species.

**Schweizer (1981)** investigated *Chenopodum album*, *Kochia scoparia* and *Amaranthus retroflexus* on sugar beet in a 3-yr field study. At densities of 6, 12, 18 and 24 broad leaved weeds/30 m long of row, root yields were reduced by 13, 24, 33 and 39%, respectively, fewer than 3 weeds/ 30 m of row did not significantly reduce root yield.

**Desheesh *et al.* (1983)** found that beet yield was reduced by 70.3-73.5% due to the weed infestation.

**Pozsgai (1984)** concluded that as weed density increased there was a reduction in pure sugar percentage.

**Schweizer and Lauridson (1985)** showed that the yield of sugar beet roots and recoverable sucrose/ha decreased as the density of Powell amaranth (*Amaranthus powellii*) increased. At densities of 6, 12, 18 and 24 *A. powellii* plants/30m row, root yields were reduced by 8, 14, 24 and 25%, respectively and recoverable sucrose yields were reduced by 7, 13, 23 and 24%, respectively.