



**EFFECT OF PLANTING PATTERNS AND NK
FERTILIZERS LEVELS UNDER TWO PLANTING
DATES ON GROWTH AND YIELD OF EGYPTIAN
COTTON IN MIDDLE EGYPT**

By

MELAD ATEF SHAKER GHOPRIAL

B. Sc. Agric. Fac. of Agric. Cairo University, 2012

M.Sc. Agric. Sci. (Agron.), Moshtohor- Benha Univ., 2018

THESIS

**Submitted in Partial Fulfillment of the
Requirements for the Degree of**

**DOCTOR OF PHILOSOPHY
IN**

**AGRICULTURAL SCIENCES
CROP PRODUCTION**

*Department of Agronomy
Faculty of Agriculture
Benha University*

2021

ABSTRACT

Melad Atef shaker Ghoprial. Studies on growth, yield, yield components and fiber properties of new promising hybrid cotton (CB58 X Giza 90) as affected by planting patterns and NK fertilizers levels under two planting date published Ph.D. of Science in Agriculture Science, Department of Agronomy, Faculty of Agriculture, Benha University, 2021.

Two field experiments were conducted at the Mallawi region, Minia Governorate, Egypt, during the growing seasons of 2019 and 2020. to study the effect of two planting date, four plant patterns and three NK fertilizer rates on growth, yield and yield components as well as fiber properties of cotton hybrid. The variables in each experiment were distributed as randomized complete block design (RCBD) using split split-plot arrangement with 4 replicates. Two sowing dates were arranged in the main plots, the sub plots were assigned random by to the four planting patterns randomly and the three NK fertilizers levels were arranged random by in the sub sub-plots. The area of each sub sub-plot was 23.4 m² (including 6 ridges width of ridge was 65 cm and the length of ridge was 6 m).

The results could be summarized as follows:

- 1- Planting date at 20th March was significantly increased all studied traits. Whereas, planting date at 20th April were significantly increased plant height in two season except micronaire reading, 2.5% span length and uniformity ratio in first season and inter node length, Number of plants fed⁻¹ and plant losses% in second season.
 - 2- Planting patterns gave the highest values of all studied traits except No. monopodial plant⁻¹ in first season and No. node plant and No. total bolls plant⁻¹ in second season.
-

- 3- NK3 (75 kg N + 48 kg K₂ O fed⁻¹) increased significantly in all studied traits except Shedding %, No. plants fed⁻¹ at harvest, plant losses % at harvest, micronaire reading, 2.5% span length, uniformity ratio in the two season. and Fiber strength in the first season and Lint % in the second season.
 - 4- The interaction effect, among planting date, planting patterns and NK fertilizer levels were significant differences of No. sympodial in the first season and No. days to first flower appearance, No. days to first open boll in the second season.
-

CONTENTS

Subjects	Pages
I. INTRODUCTION.....	1
II. REVIEW OF LITERATURE.....	4
1. Effect of planting dates on Egyptian cotton	4
2. Effect of planting patterns on Egyptian cotton	8
3. Effect of NK fertilizers levels on Egyptian cotton	13
4. Effect of the interactions.....	16
III. MATERIAL AND METHODS.....	18
IV. RESULTS AND DISCUSSION.....	26
<i>Effect of planting dates, planting patterns, NK fertilizer and their interactions on</i>	26
1. Plant height at harvest in (cm).....	26
2. Number of monopodial plant ⁻¹ at harvest.....	28
3. Number of sympodial plant ⁻¹ at harvest	31
4. Number of node plant ⁻¹	34
5. Inter node length (cm).....	36
II. Flowering and Earliness characters:	39
1. The first fruiting node	39
2. Number of days to first flower appearance	42
3. Number of days to first boll opening.....	44
4. Number of fruiting sites plant ⁻¹	47
5. Shedding percentage of bolls	50
III. Yield and yield components:.....	52
1. Number of open bolls plant ⁻¹	55
2. Number of total bolls plant ⁻¹	55
3. Boll weight (g).....	57
4. Seed cotton yield plant ⁻¹ (g)	60
5. Seed cotton yield fed ⁻¹ (kentar).....	63
6. Lint percentage	66
7. Lint cotton yield fed ⁻¹ (kentar).....	69
8. Seed index (100-seed weight (gm.)	71
IV. Quality characters:.....	72
A. Fiber bundle tensile properties.....	72

1. Micronaire reading (Mic. Reading)	76
2. Fiber strength (pressly index).....	78
B. Fiber length parameters.....	79
1. 2.5% span length, in (mm).....	80
2. Length uniformity ratio	82
VI. English summary.....	85
VII. References.....	95
VIII. Arabic summary	-



List of Tables

Tables	Page No.
Table 1. Mechanical and chemical analysis of the experimental sites during 2019 and 2020 seasons.	19
Table 2. Average monthly climatic data of Mallawi location during the two studied seasons of 2019 & 2020.	20
Table 3: plant height at harvest in (cm) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	27
Table 4: NO. monopodial plant⁻¹ at harvest of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	30
Table 5- NO. sympodial plant-1 at harvest of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	33
Table-6: NO. node plant-1 of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	35
Table: 7 Inter node length(cm) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	38

Tables	Page No.
Table 8: The first fruiting node of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	41
Table 9: NO. days to first flower appearance of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	43
Table 10: NO. days to first boll opening of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	46
Table 11: NO. fruiting sites plant-1 of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	49
Table 12: Shedding percentage of bolls of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers fertilizers levels and their interactions in 2019 and 2020 seasons	51
Table 13: NO. open bolls plant⁻¹ of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	53

Tables	Page No.
Table 14: NO. total bolls plant⁻¹ of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	56
Table 15: Boll weight (g) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	58
Table 16: Seed cotton yield plant⁻¹ (g) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	62
Table 17: Seed cotton yield fed-1 (kentar) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	65
Table 18 Lint percentage of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	68
Table 19: Lint cotton yield fed⁻¹ (kentar)of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	70

Tables	Page No.
Table 20: Seed index (g) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons.	72
Table 23: Lint index (g) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons.	75
Table 24: Micronaire reading (Mic. Reading) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	77
Table 25: Fiber strength (pressly index) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons.	79
Table 26: 2.5 % span length (mm) of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	81
Table 27: Length uniformity ratio (%)of Egyptian cotton as affected by planting date, planting patterns, NK fertilizers levels and their interactions in 2019 and 2020 seasons	83
