

A STUDY OF SOME FACTORS AFFECTING YIELD
AND FIBER PROPERTIES IN COTTON

BY

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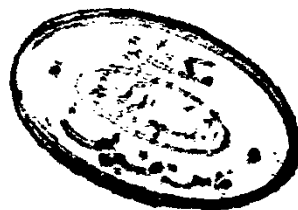
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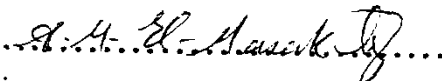
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ABSTRACT

Two experiments were conducted at Bahtim Research Station during two successive seasons to study the effect of four winter legume (clover 3-cuts, lentil and faba beans) and cereal (barley) crops preceding cotton and the effect of growing cotton by transplantation compared with direct seeding, as well as application of two levels of N fertilization on growth, earliness, yield and its components and quality of fibers and yarn of cotton variety; Giza 75. Results can be summarized as follows

- 1- Effect of preceding crop : As compared to barley, growing cotton after legume crops significantly increased plant height at different stages of growth, number of fruiting branches, number and weight of completely and non-completely open bolls, seed cotton yield per plant and per feddan, seed index, fiber length, micronaire value, hair weight, fiber maturity, fiber strength and yarn and single strand strength as well as reducing number of fiber neps. It was concluded that growing cotton after legume crops was favourable than growing after barley and within legumes, growing cotton after clover was more favourable than lentil

and faba beans, especially for yield and fiber quality. On the other hand, growing cotton after barley resulted in slight earliness expressed as days to first flower appearance and first boll opening. Other traits were not affected by preceding crops.

2- Effect of transplantation : As compared to direct seeding, transplantation proved to be favourable for good growth of cotton plants. Earliness was very pronounced in transplanted cotton. Seed cotton yield and its components and lint quality were markedly greater in case of transplanting. On the other hand, direct seeding increased number of germinated hills and number of plants/fed. at harvest. Transplantation, if practically applied will solve the problem of late sowing and improves yield and quality of cotton.

3- Effect of N levels : Significant high expressions of plant height, fruiting branches, completely open bolls, seed-cotton yield, weight of seed cotton per boll lint %, seed index, fiber length and strength, micronaire value, yarn and single strand strength and lower number of neps were obtained by applying a high level of 80 kg N/fed. On the other hand, low level (40 kg) caused slight earliness and reduced number of infested non-completely open bolls.

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This Thesis is Dedicated to the Memory of the Late
Prof. Dr. Yousef Shalaby Who Was My First Supervisor

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INTRODUCTION

In the last decade, both acreage and production of cotton are gradually decreasing. The total production of seed cotton decreased from 9,985,000 cantars in 1982 season to 6,211,000 cantars in 1989 season. Also yield per feddan gradually decreased from 8.40 cantars in 1982 to only 6.13 cantars in 1989(*) with another decrease recorded in 1990 cotton harvest. This reduction in total production and yield per unit area is attributable, at least in part, to the tendency of cotton growers to delay the date of sowing cotton, aiming to gain a full-season of winter crops before growing cotton.

Many workers reported that cotton yield was reduced by delaying sowing dates (Shalaby and Shalaby, 1976; Hussien et al, 1983; Singh et al, 1969; Sendouka et al, 1980 and El-Hariry, 1986). The winter crops preceding cotton may be cereals such as wheat or barley or legumes such as lentil and faba beans or forage legumes like Egyptian clover (berseem). These preceding crops are not merely traditional but nowadays are considered strategic crops. There is no way to conform between gaining a full-season of winter crops and planting cotton in the proper date. Thinking to raise seedlings in a nursery or seedbed in the proper date of sowing cotton to be later transplanted in the permanent field after clearing-off winter crops is a practice proposed to solve the problem of late cotton sowing.

The rotation of crops plays an important role in the system of crop husbandry. As the yields of crops may be profoundly affected

(*) Source : The Egyptian Cott. Gazette, No. 93, July, 1989.

by the preceding crops, the effect of some of the more common winter crops on cotton yield and lint quality are aimed to be investigated. The soil content of nitrogen as well as the nitrogen added in the form of chemical fertilizer are considered the main factors affecting the production of cotton. In this respect, the preceding crop either cereal or legume has a direct effect on the soil nitrogen content.

With these consideration in mind, the present study aimed to investigate the growth and earliness of cotton, yield and yield attributes and lint and yarn characteristics as affected by the following three main treatments :

- 1- Preceding winter crops, viz., Egyptian clover, lentil, faba beans and barley.
- 2- Transplantation procedure in comparison with direct seeding.
- 3- Two levels of nitrogen fertilizer.

REVIEW OF LITERATURE

The pertinent literature dealing with the effect of preceding crops, transplantation and fertilization on growth, earliness characters, yield and yield components and fiber and yarn properties will be arranged under the following three main headings.

I- Preceding crops

A- Growth characters :

- 1- Percentage of successful hills : Wahhab and Ahmad (1959), at West Pakistan, showed that germination counts were not affected statistically by the preceding crops.
 - 2- Plant height at different stages of growth : Wahhab and Ahmad (1959), observed that plant height at maturity was not affected statistically by the preceding crops, whereas El-Moghazy et al. (1983), in Egypt, noticed that plant height of cotton plants increased gradually from one cut to another of preceding clover. Maximum plant height of cotton plants was attained by sowing cotton after faba beans, but cotton sown after wheat gave the shortest plant height.
 - 3- Number of fruiting branches per plant : El-Moghazy et al. (1983), in Egypt, noted that the minimum number of fruiting branches per plant was attained by sowing cotton after wheat, but the increases in number of fruiting branches per cotton plant were after legume crops.
- #### B- Earliness characters :
- 1- Node number of first sympodium : Wahhab and Ahmad (1959), at the West Pakistan and El-Moghazy et al. (1983), in Egypt, observed