



**Effect of some agricultural practices on shedding,  
metabolism activity and yield of cotton in Upper Egypt**

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### SUMMARY

The present investigation was carried out at Shandaweel Agric. Res. Station (Sohag Governorate), A.R.C., Ministry of Agriculture, Egypt A.R.E., during the two successive seasons of 2014 and 2015 to study the effect of planting date, fertilizers rates and splitting fertilizers on shedding, metabolism activity, yield and its components on Egyptian cotton (*Gossypium barbadense L.*) variety Giza- 90. Each season contained two separate experiments represented in two sowing dates i.e. on 20<sup>th</sup>March and 20<sup>th</sup>April. The variables in each experiment were distributed in randomized complete block design (RCBD) using split plot arrangement with 4 replicates. The variables studied in each planting were fertilizers rates and splitting fertilizers.

The first variable was fertilizers rates which were allotted in the main plots. The treatments were distributed as follows:

- 1) 50 kg N + 24 kg K<sub>2</sub>O /fed.
- 2) 50 kg N + 24 kg K<sub>2</sub>O /fed. + Spray micronutrients (200g /fed.).
- 3) 70 kg N + 36 kg K<sub>2</sub>O /fed.
- 4) 70 kg N + 36 kg K<sub>2</sub>O /fed. + Spray micronutrients (200g /fed.).

The second variable was the fertilizer splitting of N & K. This variable occupied in the sub-plots. The treatments were distributed as follows:

- a) Splitting the fertilizer rates into two equal parts before the second and the third irrigation.

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b) Splitting the fertilizer rates into three equal parts before the second, the third and the fourth irrigation

c) Splitting the fertilizer rates into four equal parts before the second, the third, the fourth and the fifth irrigation.

The combined analysis was carried out in each year for all characters to study the effect of planting dates and all interactions involved. The results obtained in this study could be summarized as follows:

### **A. Agronomic characters:**

#### **A-1: Average plant height at harvest in cm:**

Plant height increased significantly in late planting during the two growing seasons. The data revealed that increasing fertilizer rates gave the maximum plant height. Micronutrients failed to show any effect in this respect. The data revealed that splitting fertilization into four doses increased significantly plant height. The interactions of fertilizers rate x planting date and fertilizers splitting x planting date were significant in the two growing seasons.

#### **A-2: Average total soluble carbohydrates:**

The results in this respect proved that early sown seedlings were characterized with high level of total soluble carbohydrates. The fertilizer rates and splitting didn't show any effect in this respect.

### **B. Flowering and shedding percentages:**

#### **B-1: Average total number of squares per plant:**

Marked differences were found in this respect as affected by planting dates. The maximum number of squares was produced from planting on 20<sup>th</sup> March. Fertilizer rates had a significant effect on the total number of squares /plant in the two growing seasons. The higher fertilizer rates succeeded in

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producing the maximum number of squares. The results proved that number of squares /plant tended to be increased as number of partitioning fertilizers was increased. Micronutrients sprayed failed to show any effect in this respect. The interactions between planting date x fertilizers rate and planting date x splitting fertilizers were significant in the two growing seasons.

### **B-2 Average total number of flowers per plant:**

Marked differences were found in this respect as affected by planting date. The maximum number of flowers was produced from planting on 20<sup>th</sup> March. Fertilizers rates had a significant effect on the total number of flowers /plant in the two growing seasons. The higher fertilizers rates succeeded in producing the maximum number of flowers. The results proved that number of flowers per plant tended to be increased as number of partitioning fertilizers was increased. Micronutrients sprayed failed to show any effect in this respect. The interactions between planting date x fertilizers rate and planting date x splitting fertilizers were significant in the two growing seasons.

### **B-3 Shedding percentage of squares/plant:**

The results showed a significant decrease of the shedding squares in early sowing during the two growing seasons. The results revealed that increasing the fertilizers rates produced higher values of squares shedding. Micronutrients failed to show any noticeable effect in this respect. Splitting the fertilizers had a significant effect in that matter. Shedding values tended to be increased as number of partitioning fertilizers was increased. The first order interactions, i.e. planting date x fertilization rate and planting date x splitting the fertilizers were significant in the two growing seasons.

### **B-4 Shedding percentage of bolls/plant:**

The results showed that delaying the planting date till April led to increase the shedding of bolls compared with early planting ones. The results revealed that increasing the fertilizers rates produced lower values of bolls shedding. Micronutrients failed to show any effect in this respect. Splitting the fertilizers had a significant effect in that matter. Shedding values tended to be decreased as number of partitioning fertilizers was increased. The first order interactions, i.e. planting date x fertilizers rate and planting date x splitting the fertilizers were significant in the two growing seasons.

### **C. Earliness characters:**

#### **C-1: Location of the first sympodium on plant main stem:**

Location of the first sympodium on plant main stem tended to be higher as planting date was delayed till 20 April. Location of the first fruiting node was affected significantly by fertilizers rates in both seasons. Higher location of the first fruiting node was observed in plants received the higher fertilizers rates, regardless the micronutrients effect which failed to show any effect in this regard. The data showed that splitting fertilizers was significant in the two growing seasons and the lowest location on the cotton stem was obtained from splitting fertilizers into 4 equal doses.

#### **C-2: Average days to first flower appearance:**

The average number of days from planting to first flower appearance decreased significantly with delaying the planting date. Fertilizers rates showed a significant effect in this respect. Micronutrients failed to show any effect in this regard. Here too, number of days from planting to first flower

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appearance tended to be increased as splitting the fertilizers was increased, but the differences between treatments were slight.

### **C-3: Average days to first boll opening:**

The results indicated that average interval from planting to first boll opening decreased significantly when planting date was delayed. Also, increasing the fertilizers rates lead to increase the average interval from planting to first boll opening. Here, the first order interaction, i.e. planting date x fertilizers rate was significant in the two growing seasons. Micronutrients failed to show any effect in this respect. Splitting the fertilizers had a slight effect in this respect.

### **D. Lint and seed characters :**

#### **D-1: Lint percentage:**

The data revealed that delaying the sowing date led to a significant decrease in lint percentage. This trend was noted in the two growing seasons. Early sown plants produced seed cotton characterized with higher lint percentage. Increasing the fertilizers rates led to increase the lint percentage. Micronutrients sprayed didn't achieve the desired results in this respect. The first order interaction, i.e. fertilizers rate x planting date was significant in the two growing seasons. Splitting fertilizers had a significant effect on lint percentage in favor of splitting N&K four times.

#### **D-2: Seed index:**

The weight of 100-seed tended to react significantly to different planting dates in favor of early planting. Fertilizers rates had a significant effect in this respect in both seasons in favor of high rates. Micronutrients sprayed failed to show any effect in this regard. The results showed that splitting fertilizers to cotton into four doses favored seed index significantly.

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### **D-3: Lint index:**

Sowing date had a considerable effect on lint index in favor of early planting. Regarding fertilizers rates, the results indicated that increasing the fertilizers rates favored the lint index, regardless of the micronutrients sprays which failed to show any effect in this respect. The interaction of planting date x fertilizers rate was significant in the two growing seasons. Splitting fertilizers had a significant effect in lint index in favor of splitting N&K four times in the two growing seasons. However, the differences among the treatment were very slight.

### **E. Seed yield and its components characters**

#### **E-1: Average number of fruiting branches per plant:**

The results indicated that number of sympodia tended to increase in favor of early sowing in the two growing seasons. The maximum number of fruiting branches/plant was obtained from early planting. The maximum values of sympodia /plant were obtained with high fertilizers rates application. Splitting N&K had a significant effect on number of sympodia /plant. Number of sympodia /plant increased as number of splitting was increased, in the two growing seasons. Micronutrients sprayed didn't achieve the desired results in this respect. The first order interactions, i.e. planting date x fertilizers rate and planting date x splitting the fertilizers were significant in the two growing seasons.

#### **E-2: Average number of open bolls per plant:**

The maximum number of bolls per plant was obtained from planting on 20<sup>th</sup> March in the both seasons. Number of open bolls per plant was reacted significantly to apply the different rates of fertilization in both seasons. The higher values of open bolls per plant were obtained with the



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higher rates of fertilizers. Micronutrients sprays didn't shown any reaction when it added to fertilization quantities in both seasons. Regarding splitting of fertilizers, the data showed that partitioning N&K had an obvious effect in this respect in favor of splitting. However the effect was cleared in early sown plants than late ones. So, the interactions, i.e. planting date x fertilizers rate and planting date x splitting the fertilizers were significant in the two growing seasons.

### **E-3: Average weight of seed cotton per boll in gram:**

Planting date had a clear effect on boll weight in the two growing seasons. The data emphasized that early sown plants were superior to late sown ones in this respect. Fertilizers rates had a significant effect on this trait in both seasons. Increasing the fertilizers rates led to increase the boll weight. Micronutrients provided a slight effect in this respect. Average boll weight was reacted significantly to splitting the fertilizers in the two growing seasons. The data showed that splitting fertilizers favored boll weight. The maximum value in this respect was obtained from splitting the fertilizers into four equal doses. The interaction of planting date x fertilizers rates was significant during 2014 and 2015 seasons.

### **E-4: Average seed cotton yield per plant in gram:**

The maximum yield of seed cotton was produced from early planting on 20<sup>th</sup> March, in the two growing seasons. Average yield of seed cotton per plant reacted significantly to fertilizers rates in the two growing seasons. It is clear that splitting fertilizers had a considerable effect on the productivity of cotton plant in favor of splitting. This is true in the two growing seasons. The first order interactions, i.e. planting date x fertilizers rate and planting date x splitting the fertilizers were significant in the two growing seasons.

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### **E-5: Seed cotton yield in terms of Kentar/fed:**

The results proved that seed cotton yield /fed. favored the early sowing date. The results showed a significant decrease in seed cotton yield per fed. with delaying the planting date till April in the two growing seasons. Fertilizers rates had a significant effect on yield of seed cotton per unit area. The data proved that seed cotton per unit area increased significantly with high fertilization rate regardless of micronutrients effect, where it did not show a significant effect except a very slight effect in the first season (2014). Splitting fertilizers had a considerable effect on the yield of seed cotton per fed.in favor of splitting. This is true in the two growing seasons. The data proved that average yield of seed cotton/fed tended to be increased as number of splitting was increased, and splitting the fertilizers into four equal doses was the best as compared with other splits. The interactions between planting date x fertilizers rate and planting date x splitting fertilizers were significant in the two growing seasons. The interactions indicated that early sown plants have a more response for increasing the fertilizers rates, micronutrients sprays and splitting than late sown ones.

### **F. Fiber properties**

#### **F-1: Micronaire reading:**

Delaying the sowing date led to decrease the Micronaire value. Micronaire reading was insignificantly, affected by different rates of fertilizers in both seasons. Splitting fertilizers failed to show any significant effect on micronaire reading in each planting date. This is true in the two growing seasons.

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### **F-2: Upper half mean length in mm.**

The data obtained in this respect revealed that planting date affected significantly this trait in favor of early planting. Fertilizers rates and splitting fertilizers failed to show any significant effect in this respect.

### **F-3: Fiber length uniformity index (U.I.)**

Planting date, fertilization and splitting fertilizers did not show any marked effect in this respect.

### **F-4: Fiber strength (gm/tex)**

The three variables, i.e. planting date, fertilization and splitting fertilizers under study didn't effect significantly in this character

### **G. Correlation**

The correlation coefficient between total soluble carbohydrates and agronomic characters was ranged from - 0.950 to 0.982 in 2014 and from - 0.942 to 0.965 in 2015.