



SUMMARY



V-SUMMARY AND CONCLUSION

This investigation was conducted at the farm of Sids Agric. Res. Station at Beni Suif Governorate to study the effect of nitrogen, phosphorus fertilization as well as some kinds of biofertilizers on cotton growth characters, yield and its components, chemical contents of seed cotton, technological properties and nutrient contents in plant and soil during 2000 and 2001 seasons. Giza 80 cultivar was used as an experimental material .

The study included two nitrogen levels, i.e. 33 and 66 kg N/fed, two phosphorus levels (11.3 and 22.5 kg P_2O_5 /fed.) and six biofertilization treatments, namely, without biofertilization, inoculation with bacterial inocula (named F), inoculation with *Bacillus polymyxa* (named Bac.), Yeast inoculation (named Y), phosphorine inoculation (named Ph.) and inoculation with the mixture of all biofertilizers (named Mix.).

The design of the experiments was a factorial complete randomized blocks with four replications.

The results could be summarized as follow :

A- Effect of nitrogen fertilizer levels

1-Growth characters

1-The tallest cotton plant was obtained from the highest nitrogen level (66 kg N/fed.).

2- Node number of first fruiting branch was insignificantly affected by nitrogen fertilizer levels.

3- Flowering date was not affected significantly by nitrogen application.

II- Yield and yield components .

- 1- Number of fruiting branches per plant did not affect by different nitrogen levels in the first season , while in the second one increased nitrogen level up to 66 kg N/fed. significantly increased the number of fruiting branches per cotton plant .
- 2- The highest number of total bolls/plant was obtained by using 66 kg N/ fed.
- 3- Increasing nitrogen level from 33 to 66 kg N /fed significantly increased the number of opened bolls/plant .
- 4- Different levels of nitrogen had a significant effect on boll weight (g). where the heavier boll was obtained by using 66 kg N/fed .
- 5- Seed cotton yield was significantly affected by nitrogen fertilization levels in both seasons. The highest seed cotton yield/fed. obtained with the application of 66 kg N/fed .in both growing seasons. Increasing nitrogen fertilization level from 33 to 66 kg N/fed. led to an increase in seed cotton yield from 8.4 to 10.0 and 6.6 to 7.5 kentar/fed. in 2000 and 2001 seasons, respectively.
- 6- Nitrogen fertilizer exerted a significant effect on earliness percentage in the two seasons. Increasing nitrogen level

SUMMARY & CONCLUSION

from 33 to 66 kg N/fed. reduced the values of earliness percentage.

III-Technological properties

- 1- Seed index was significantly affected by different levels of nitrogen in the two successive seasons. The highest value of seed index was obtained by with 66 kg N/fed .
- 2- Lint percentage was significantly affected by nitrogen fertilization. Higher lint percentage was obtained by applying the low nitrogen level (33 kg N / fed) .
- 3- Fiber properties, i.e. staple length at 2.5 % and at 50 %, uniformity ratio (UR), fiber strength (Pressely Index) and fiber fineness (Micronair Reading) were not affected by the addition of both levels of nitrogen .

IV-Cotton seed chemical contents

- 1-Oil percentage was not affected by nitrogen levels along the two seasons.
- 2-Protein percentage significantly affected by increased nitrogen fertilization.

V-Nutrients content in cotton plant and soil

- 1-Nitrogen and phosphorus content (%) in cotton plant were significantly affected by nitrogen application. The highest values of nitrogen and phosphorus content were when 66 kg N /fed was applied. The other studied

nutrient contents were not affected by nitrogen fertilization.

2-Soil available nitrogen at 45, 60 and 75 days after planting was significantly affected by nitrogen application. The highest values of soil available nitrogen were recorded for the plots fertilized with the higher nitrogen level (66 kg N/fed.). On the other hand the other soil available nutrients (P,K,Fe, Mn,Zn and Cu) were not affected by the nitrogen fertilization.

B- Effect of phosphorus fertilizer levels

I-Growth characters

Plant height, node number of fruiting branches and flowering date were not affected by phosphorus fertilization.

II- Yield and yield components.

- 1- Phosphorus fertilizer at rate of 22.5 kg P_2O_5 /fed significantly increased the number of fruiting branches per plant in the first season only as compared with 11.3 kg P_2O_5 /fed.
- 2- Number of total bolls plant significantly increased by phosphorus fertilization in both seasons.
- 3- Phosphorus application significantly increased number of opened bolls /plant in the two seasons. The highest value of opened bolls plant was obtained for the plots fertilized with 22.5 kg P_2O_5 /fed .

SUMMARY & CONCLUSION

- 4- Boll weight was not affected by phosphorus application in the two growing seasons.
- 5-Phosphorus fertilization had a significant effect on seed cotton yield in both seasons. Application of phosphorus fertilizer at 22.5kg P_2O_5 / fed led to an increase in seed cotton yield by 3.5 and 7.4 % as compared with 11.3 kg P_2O_5 /fed. in both seasons ,respectively.
- 6-Increasing phosphorus levels significantly increased the earliness percentage in the first season only.

III- Technological properties

Phosphorus fertilization levels had no significant effect on seed index, lint percentage and the studied fiber properties (staple length at 2.5% and 50 %,uniformity ratio, fiber strength and fiber fineness) in both growing seasons.

IV- Cotton seed chemical contents :

Oil and protein percentage were not affected by phosphorus fertilization in both seasons.

V-Nutrients content in cotton plant and soil

I Increasing phosphorus levels increased the phosphorus content percentage in cotton plant in the two seasons. On the other hand the other nutrients content (N, K, Fe, Mn, Zn and Cu) were not affected by the phosphorus fertilization.

2-Phosphorus fertilization at level of 22.5kg P_2O_5 /fed significantly increased the soil available phosphorus at 45, 60, and 75 days after planting in both seasons. The other soil available nutrients were not affected by increasing phosphorus levels.

C-Effect of biofertilizers :

1-Growth characters :

- 1-Biofertilizers significantly increased the cotton plant height in both seasons except of phosphorine inoculation.
- 2-Node number of fruiting branch significantly affected by biofertilization in the two seasons. The mixture of the four inoculants induced fruiting branches production at the higher nodes of cotton stem.
- 3-Flowering date did not affected by the biofertilization in both seasons.

II- Yield and yield components

- 1-The number of fruiting branches per plant affected only by the three kinds of biofertilizers (mix., Bac. and F).
- 2-The number of total bolls per plants increased significantly by the biofertilization whereas using of mixture of the four biofertilizers gave the highest number of total bolls / plant.
- 3-The using of all kind of biofertilizers increased the number of opened bolls / plant comparing with control.

SUMMARY & CONCLUSION

4-Boll weight significantly increased by using only the mixture of the four biofertilizers.

5-All biofertilizer treatments had significant effects on seed cotton yield in kentar /fed. in both seasons as compared to uninoculated treatment. The efficiency of biofertilizers to increase seed cotton yield showed the following order:

mix .> Bac.> F > Ph >Yeast >Uninoculation.

6-Biofertilization had a negative effect on earliness percentage.

III- Technological properties :

- 1- Seed index significantly increased by biofertilization in both growing seasons except of yeast inoculation .Using the mixture of biofertilizers exerted the heavier 100-seeds weight.
- 2-Using biofertilizers namely mixture, Bac and F led to a significant decreased in lint percentage.
- 3- All studied fiber properties were not affected by the biofertilization in both growings seasons.

IV- Chemical contents of Cotton seed

- 1- Oil percentage in cotton seeds was not affected by the biofertilization in the two growing seasons .
- 2- Biofertilization treatments increased significantly the protein percentage in cotton seeds as compared to the control .

SUMMARY & CONCLUSION

V-Nutrients content in cotton plant and soil

- 1-Biofertilization treatments increased significantly cotton plant the contents of, i.e. N, P, K, Fe, Mn, Zn and Cu in the two seasons as compared with the uninoculation treatment.
- 2- All biofertilizers inoculation significantly increased soil available nutrients at 45, 60, and 75 days after sowing in both growing seasons as compared with the control, except for the soil available phosphorus at 75 days after planting in the second season, soil available potassium at 45 and 60 days after sowing in one season only and soil available zinc at 45 days after planting in the second season which were not affected by the biofertilization.

D-Effect of the interactions.

I-Growth Characters:

Plant height, node number of fruiting branches and flowering date were not affected by the interactions between any two of the three variables or among them.

II- Yield and yield components

- 1- Number of fruiting branches/ plant, number of opened bolls/plant, seed cotton yield in kantar /fed and earliness percentage were not affected by the combined interaction effects of nitrogen, phosphorus and biofertilizers in the two growing season .

SUMMARY & CONCLUSION

- 2- The number of total bolls / plant was affected significantly only by the interaction effect between nitrogen and biofertilization in the first season. The high value of the number of total bolls /plant was obtained for the plants received 66 Kg N/ fed. and inoculated with mixture of the four biofertilizers.
- 3- Boll weight was affected only by the interaction between nitrogen fertilization and biofertilizer treatments in the second season only. The heavier bolls were obtained for the plants received 66 kg N / fed and treated with the mixture of the four biofertilizers.

III Technological properties

- 1- Seed index was affected only by the interaction between nitrogen levels and biofertilization treatments. The heavier 100-seed was recorded for the plants supplied with 66 kg N /fed and inoculated with the mixture of the four biofertilizers.
- 2- Lint percentage and the studied fiber properties were not affected by the interaction between any of the two variables or among the three variables.

IV-cotton seed chemical contents:

Oil and protein percentages in cotton seeds were not affected by the interaction between the studied factors or among them.

V- Nutrients content in cotton plant and soil

- 1-The interaction effects between any two of the three variables or among them did not affect the nutrients content in cotton plant. Only phosphorus content in the two seasons was significantly affected by these interactions, except the interaction between nitrogen and phosphorus fertilization in the second season which was not affected the phosphorus content. The plants fertilized with 66 kg N and 22.5 kg P_2O_5 / fed. and inoculated with the mixture of the four biofertilizers gave the highest values of phosphorus content in cotton plant.
- 2-Soil available nutrients, (N, P, K, Fe, Mn, Zn and Cu) was not affected by the interactions between the three variables at 45, 60 and 75 days after sowing in both seasons. Only the interactions between nitrogen fertilization and biofertilization at the above-mentioned stages had a significant effect on soil available nitrogen. The highest values of soil available nitrogen were obtained for the plots fertilized with 66 kg N/fed and received the mixture of the four biofertilizers.