SUMMARY AND CONCLUSION

V- SUMMARY AND CONCLUSIONS

Two field experiments were conducted at Sids Agricultural Research Station, Beni-Suef Governorate, during 2000/2001 and 2001/2002 growing seasons to study the effect of nitrogen (0,25,50 and 75kg/fed), phosphorus (0 and 45 kg P_2O_5 fed) and potassium (0 and 24 kg K_2O/fed) fertilization and their interactions on oilseed rape (*Brassica napus L.*). A factorial in complete randomized blocks design with four replicates was used. Pactol cultivars of rape was used in both seasons. Planting date was on November 23 and 21 in 2000/2001 and 2001/2002 seasons, respectively.

The obtained results were analyzed statistically. The obtained results could be summarized as follows:

A- Effect of nitrogen fertilizer levels:

I- Growth characters

1- Plant height at 90 days after sowing and at harvesting significantly increased with increasing nitrogen level up to 75 kg/fed.

2- Number of leaves per plant at 90 days after sowing was increased with increasing nitrogen rates till 75 Kg/fed.

3- The increase in nitrogen application up to 75 kg/fed earliest the initiation of the number of days to appear the first flower in the first season only.

4- Flowering date measured as the number of days from sowing to 50% flowering did not affect by nitrogen fertilizer levels..

5- Number of branches per plant increased as level of nitrogen fertilizer increasing.

6- Dry weight at 90 days after sowing and at harvesting significantly increased as nitrogen level increase up to 75 Kg/fed.

II- Yield and yield components

1- Increasing nitrogen fertilizer rates increased number of pods per plant and number of seeds of pod. However, decreased 1000-seed weight in the first season.

2- Increasing nitrogen level up to 75 kg / fed significantly increased seed and straw yield of canola plant in kg/fed.

III- Seed quality

1- Seed oil percentage increased as a result of increasing nitrogen fertilization level in the second season, but no clear trends were obtained in the first one.

2- Nitrogen application tended to increase the oil yield in kg/fed by 47, 72. 5 and 89% under 25, 50 and75 kg N/fed, respectively as compared with control for the first season and 38.8, 100.8 and 144.5% for the second season, in the same order.

3- Seed protein percentage significantly increased due to incacasing nitrogen level in the first season only.

4- Increasing nitrogen level up to 75 kg/fed significantly increased protein yield in both seasons.

IV- NPK components

1- Nitrogen fertlizer increased nitrogen and potassium percentage in plant at 90 days after sowing in the two growing seasons, nitrogen percentage in seeds in the first season and phosphorus percentage in plant at 90 days after sowing and straw as well as potassium percentage in seeds in the second season. However, nitrogen parentage in plant at 90 days after sowing and in straw, phosphorus percentage in seeds and potassium percentage in straw did not affect by nitrogen fertilization level in both growing seasons.

2- Nitrogen, phosphorus and potassium uptake by seeds, straw and total uptake increased significantly as nitrogen levels increasing.

B- Effect of phosphorus levels.

I- Growth characters

1- Plant height at 90 days after sowing and at harvesting increased by phosphorus application, while number of days to first flower and flowering date significantly decreased as phosphorus level increasing.

2- Number of leaves and branches per plant increased by phosphorus application in one season only , while dry weight at 90 days after sowing and after harvesting significantly increased by phosphorus application in the two seasons.

II- Yield and yield components

1- Number of pods per plant increased by increasing phosphorus level in one season only.

2- Number of seeds per pod and 1000-seed weight were not significantly affected by phosphorus application.

3- Seed yield per fed significantly increased due to phosphorus fertilization compared with control. The lowest seed yield was produced from the unfertilized plant. However, application of 45 kg P_2O_5/fed gave the highest seed yield in both seasons.

4- Addition of 45 kg P_2O_5/fed significantly increased straw yield in kg/fed in the two successive seasons.

III- Seed quality

1- Phosphorus application resulted in a significant increase in oil yield. The increments of seed oil yield due to phosphorus application at rate of 45 kg P_2O_5/fed were 8.6 and 13% as compared with control in the two seasons, respectively.

2- Phosphorus fertilizer had no significant effect on seed oil and protein percentage as well as seed protein yield.

IV- NPK components

1- Nitrogen and potassium percentage in plant at 90 days after sowing and at harvesting as well as in seeds and straw were not affected by phosphorus fertilization.

2- Phosphorus application at rate of 45 kg P_2O_5/fed significantly increased phosphorus percentage in plant at 90 days after sowing in the two seasons and in seeds and straw in one season only.

3- Nitrogen and potassium uptake by seeds and / or straw were not affected by phosphorus application, except straw potassium uptake in the second season which significantly increased due to phosphorus fertilizer level at rate of 45 kg P_2O_5/fed.

4- Phosphorus fertilizer exerted a significant effect on phosphorus seed and straw as well as total uptake in the second season only.

C- Effect of potassium levels

I- Growth characters.

Plant height at 90 days after sowing, number of days to first flower, flowering date, number of branches per plant and the dry weight per plant at 90 days after sowing and after harvesting were not significantly affected by potassium fertilization. While, plant height at harvesting and number of leaves at 90 days after sowing increased significantly due to application of 24 kg K_2O/fed in the second season only.

II- yield and yield components

potassium fertilization had a significant effect on number of pods per plant. However, number of seeds per pod,1000 seed weight and seed and straw yield in kg/fed

were not affected by potassium fertilization levels in both season.

III- Seed quality

Potassium application had no significant effect on oil and protein percentage as well as oil and protein yield.

IV- NPK components

1- Nitrogen, phosphorus and potassium percentage in plant at 90 days after sowing (in the first season), in seeds and straw were not affected by potassium fertilization, except potassium percentage in plant at 90 days after sowing which significantly increased due to application of potassium fertilizer at rate of 24 kg K_2O/fed in the second season only.

2- Potassium fertilizer had no significant effect on nitrogen , phosphorus and potassium uptake by seeds and / or straw in both growing seasons, except straw nitrogen uptake in the second season which significantly decreased by increasing potassium fertilization up to 24 kg K_2O/fed

D- Effect of the interactions

I- Growth characters

1- Plant height and number of leaves per plant at 90 days after sowing, number of days to appear the first flower, flowering date and the dry weight at 90 days after sowing and at harvesting were not affected by the interactions between any of the three variables or among them.

2- Plant height at harvesting stage and number of branches per plant were significantly affected by the interaction between nitrogen and potassium fertilization in one season only.

II yield and yield components

1- Number of pods per plant was effected significantly by the interactions between nitrogen and potassium fertilization as well as among nitrogen, phosphorus and potassium fertilization in the first season. The highest value of number of pods per plant in the first season was obtained for the plant fertilized with 75 kg N, 45 kg P_2O_5 and 24 kg K_2O/fed.

2- Number of seeds per pods was affected only by the interaction between nitrogen and potassium fertilizer levels in the second season.

3- The interactions between the three variables were not affected 1000-seed weight and seed yield in kg/fed.

4- Straw yield of canola plant was significantly affected by the interaction among nitrogen, phosphorus and potassium fertilization treatments. The highest value of canola straw yield was recorded for the plants fertilized with 75 k N + 45 kg P_2O_5/fed + 24 kg K_2O/fed in the second season.

III- Seed quality:

Oil and protein percentage as well as oil and protein yield were not affected by the interaction

between any of two variables or among the three studied variables.

IV- NPK components

Nitrogen, phosphorus and potassium percentage in plant at 90 days after sowing , in seeds and straw as well as nitrogen, phosphorus and potassium uptake in seeds and /or straw were not affected by any of the studied interactions in both seasons.