

S U M M A R Y

Two experiments were conducted in the new reclaimed soil of Noubaria Agricultural Research Station, Noubaria , Mariot , Behera Governorate during 1981 and 1982 seasons . The aim of these experiments was to find out the optimum doses of phosphorus and nitrogen fertilizers on yield performance of three sunflower (Helianthus annuus L.) varieties , i.e. Giza 1 , Mayak and Sorem 80 .

The experimental layout was split-split-plot design with four replications where the varieties were assigned in the main plots , followed by phosphorus fertilizer with three levels, i.e. 0 , 15 and 30 kg P_2O_5 / fed., while nitrogen fertilizer were arranged the sub sub plots with three levels of 0 , 30 and 60 kg^N/fed. The measured characters were number of days ^{to} 50 % flowering , number of days to physiological maturity , number of leaves per plant , leaf area per plant, stem diameter , plant height , head diameter , 100-seed weight, seed yield per head , seed husk percentage , seed oil content, seed yield per feddan and oil yield per feddan . The results obtained will be summerized as follows :

I - Effect of the varieties :

1. Sorem 80 was the earlist variety to reach flowering ,
whereas Giza 1 was the latest one and Mayak was intermediate.

2. Sorem 80 was the earliest variety to reach physiological maturity followed by Mayak, while Giza 1 was the latest one.
3. Giza 1 had more number of leaves than Mayak and Sorem 80¹.
4. Leaf area per plant of Giza 1 variety was significantly exceeds that of Mayak and Sorem 80 , while that of Mayak exceeds of Sorem 80 .
5. The thickest variety was Giza 1 followed by Mayak and the thinnest one was Sorem 80 .
6. Giza 1 variety was significantly taller than Mayak and Sorem 80 and Mayak had taller plants than Sorem 80 .
7. Giza 1 significantly exceeds both Mayak and Sorem 80 in head diameter , Sorem 80 produced larger heads than Mayak in both seasons but the difference was significant only in 1982 .
8. Generally Giza 1 had the heaviest 100-seed weight followed closely without significant difference by Sorem 80 and both exceeds that of Mayak .
9. Giza 1 variety significantly exceeds Mayak and Sorem 80 in seed yield per head . Whereas seed yield per head of Mayak variety significantly exceeds that of Sorem 80 .
10. Varieties differed significantly in seed husk percent where Giza 1 had the highest percent followed by Mayak and the lowest percent was for Sorem 80 .
11. Sorem 80 had the highest oil percent followed closely by Mayak whereas Giza 1 had low oil percent .
12. Seed yield per feddan varied considerably among the used varieties. Giza 1 produced the highest seed yield and significantly exceeds

the other two varieties . Mayak significantly produced more seed yield than Sorem 80 .

13. Oil yield per feddan was highest for Sorem 80 and lowest for Giza 1 while it was intermediate for Mayak .

II- Effect of phosphorus fertilizer :

- 1 - Phosphorus fertilizer had no significant influence on number of days from planting to flowering , number of days from planting to physiological maturity , number of leaves per plant, stem diameter , 100-seed weight , seed yield per plant and seed husk percent for the varieties under study in both seasons.
- 2 - Phosphorus fertilizer significantly increased the leaf area / plant whereas the difference between applying 15 and 30 kg P_2O_5 /fed. was significant only in 1982, season .
- 3 - Phosphorus fertilizer significantly increased the plant height, the difference between applying 15 and 30 kg P_2O_5 /fed was significant only in 1981 season .
- 4 - Phosphorus fertilizer significantly increased head diameter and seed oil content, with non significant difference between 15 kg P_2O_5 /fed and 30 kg P_2O_5 /fed levels in both seasons .
- 5 - Phosphorus fertilizer at 15 kg P_2O_5 /fed. significantly increased seed yield per feddan and oil yield per feddan , whereas applied 30 kg P_2O_5 /fed reduced it than the 15 kg P_2O_5 level significantly in 1981 season and the reduction did not reach the level of significance in 1982 season .

III- Effect of nitrogen fertilizer :

- 1 - Nitrogen fertilizer had no influence on the number of days from planting to flowering .
- 2 - Maturation significantly was retarded by nitrogen fertilization.
- 3 - Nitrogen fertilizer significantly decreased the number of leaves per plant .
- 4 - Leaf area/plant , stem diameter , plant height , head diameter, seed yield/plant and seed yield per feddan significantly increased with increasing nitrogen fertilizer rates .
- 5 - Nitrogen fertilizer at 30 kg N/fed. significantly increased 100-seed weight , whereas applied 60 kg N/fed. increased it more than the 30 kg N/fed. level significantly only in 1982 season .
- 6 - Nitrogen fertilizer at 30 kg N/fed. had no significant effect on seed husk percent , whereas applied 60 kg N/fed. significantly increased it , in both seasons .
- 7 - Nitrogen fertilizer at 30 kg N/fed significantly decreased seed oil content only in 1981 season , whereas applied 60 kg N/fed. decreased it significantly , in both seasons .
- 8 - Nitrogen fertilizer significantly increased oil yield per feddan, whereas the difference between 30 kg N/fed and 60 kg N/fed. levels was significant only in 1981 season .

IV- Effect of the interaction :

- 1 - The interaction between all the studied factors had no significant effect on number of days to flowering , No. of days to physiological maturity , No. of leaves/plant , seed husk percent and seed oil content .

- 2 - Leaf area/plant was significantly influenced by the interaction between varieties and phosphorus fertilizer levels in 1981 season and between varieties and nitrogen fertilizer in both seasons .
Addition of 15 and 30 kg P_2O_5 /fed increased the varieties by 16.5 % and 17.3 % for Giza 1 , by 8% and 18.6% for Mayak and by 5.3 % and 8.3 % for Sorem 80 . Giza 1 was the most responsible variety to nitrogen fertilization in the two seasons .
- 3 - Stem diameter was significantly influenced by the interaction between phosphorus and nitrogen fertilization in both seasons, the thickest stem was recorded for applying 30 kg P_2O_5 + 60 kg N/fed. in 1981 and for 15 kg P_2O_5 + 60 kg N/fed. in 1982 season.
- 4 - Plant height was significantly influenced by the interaction between varieties and nitrogen fertilizer and between phosphorus and nitrogen fertilizers in both seasons . The most responsible varieties were Mayak in 1981 and Sorem 80 in 1982 season , the tallest plant were recorded for applying 30 kg P_2O_5 + 60 kg N/fed. in both seasons .
- 5 - Head diameter was significantly influenced by the interaction between varieties and nitrogen in 1982 and between phosphorus x nitrogen fertilizers in both seasons . The largest heads were recorded for Giza 1 fertilized with 60 kg N/fed. in 1981 season, and for applying 30 kg P_2O_5 + 60 kg N/fed. in both seasons .
- 6 - The weight of 100-seed was significantly influenced by the interaction between phosphorus x nitrogen fertilizers only in 1981 season . The highest 100-seed weight was recorded for applying 30 kg P_2O_5 + 60 kg N/fed.

- 7 - Seed yield per plant was significantly influenced by the interaction between varieties x nitrogen fertilizer in 1982 season . The highest seed yield/head was obtained from Giza 1 received 60 kg N/fed.
- 8 - Seed yield per feddan was significantly influenced by the interaction between varieties x nitrogen fertilizer and between phosphorus x nitrogen fertilizers in both seasons . The highest seed yield/feddan was obtained from Giza 1 received 60 kg N/fed. and by applying 15 kg P_2O_5 + 60 kg N/fed. in 1981 and 30 kg P_2O_5 + 60 kg N/fed. in 1982 .
- 9 - Oil yield per feddan was significantly influenced by the interaction between varieties x nitrogen in 1982 and between phosphorus x nitrogen in both seasons . The highest oil yield/feddan was obtained from Sorem 80 , fertilized by 60 kg N/fed., and by applying 15 kg P_2O_5 + 60 kg N/fed. in 1981 and 30 kg P_2O_5 + 60 kg N/fed. in the second season .