SUMMARY

Two field experiments were carried out during 1985 and 1986 seasons at the Demonstration Field of Meet Ghamr, Dakhlia Governorate. The aim of the experiments was to study the effect of varieties and fertilization on growth and yield of rice (Oryza sativa L.).

The soil of the experiments was clay loamy alluvial with a pH of 8.0, an organic matter content of 2.0 % and contained 45 ppm N and 40 ppm available P.

Each experiment included 24 treatments which were the combination of two varieties and twelve fertilization treatments. Factors under study were:

A. Varieties : Giza 172 and IR-1626.

B. Fertilization :

1. Without fertilizer (NoPo)
2. 24 kg P_2O_5/fed. (NoP1)
3. 48 kg P_2O_5/fed. (NoP2)
4. 30 kg N/fed. (N1Po)
5. 30 kg N + 24 kg P_2O_5/fed. (N1P1)
6. 30 kg N + 48 kg P_2O_5/fed. (N1P2)
7. 60 kg N/fed. (N2Po)
8. 60 kg N + 24 kg P_2O_5/fed. (N2P1)
9. 60 kg N + 48 kg P_2O_5/fed. (N2P2)
10. 90 kg N/fed. (N3Po)

11. 90 kg N + 24 kg P_2O_5/fed. (N3P1)

12. 90 kg N + 48 kg P_2O_5/fed. (N3P2)

The design of the experiments was a split-plot with four replications. The two varieties were arranged at random in the main plots and the sub plots were assigned to fertilization treatments. The sub plot area was 21 m^2 (1/200 fed.).

Results could be summarized as follows :

1. Varieties exerted a marked effect on the heading date in the both seasons. Giza 172 had the shortest period to heading than IR 1626. Fertilization treatments showed significant effect on the number of days from sowing to heading. Application of N alone prolonged the period to heading. On the other hand, the combination of N and P fertilizers significantly reduced the number of days from sowing to heading.

2. Varieties exhibited significant effects on stem length of rice plants at heading as well as at harvesting. Giza 172 produced higher plants than IR 1626 in the both seasons.

   At harvesting stage, application of N and P fertilizers significantly increased the stem length of rice plants in the two successive seasons.

3. There was no significant difference in the number of plants/m^2 among the two rice varieties in 1985 and 1986 seasons.

   On the other hand, number of plants/m^2 were significantly affected to different extents by fertilization with nitrogen and

phosphorous in both seasons.

4. Rice varieties showed no significant effect on the number of ear-bearing plants/m^2 in the two successive seasons.

   On the contrary, number of ear-bearing plants/m^2 significantly increased with increasing levels of fertilizer up to 90 kg N/fed. in the first and 60 kg N + 24 kg P_2O_5/fed. in the second season.

5. Varieties had no significant effect on the area of flag leaf in the two successive seasons. Likewise, area of flag leaf was not significantly affected by the application of fertilizers.

6. Varieties differed significantly in percentage of loding. Giza 172 surpased significantly the variety IR 1626 in the two seasons.

   Fertilization showed significant effect on the percentage of lodging in 1985 and 1986 seasons. The application of fertilizers especially nitrogen significantly increased lodging percentage of rice plants.

7. In both seasons, rice varieties showed significant effect on panicle length. Giza 172 had longer panicles compared with IR 1626.

   On the other hand, the length of rice panicle were not significantly influenced by the application of N and P in the two seasons.

8. Varietal effect on the weight of panicle failed to reach the significant level at 5 % in the two successive seasons.

The effect of fertilizers on panicle weight showed seasonal variations. Whereas, the weight of panicle significantly decreased with increasing levels of fertilizer up to the higher level (90 kg N + 48 kg P_2O_5) in the second season only.

9. Varieties of rice had significant effect on the number of grains/panicle in the second season only. IR 1626 had a greater number of grains/ panicle compared with Giza 172.

Whereas, application of N and P showed no significant effect on the number of grains/panicle in the two seasons.

10. Weight of grains/panicle did not differ significantly among the two rice varieties in the two successive seasons.

While, the effect of fertilization on the weight of grains/panicle showed seasonal variation. In 1986 season, weight of grains/panicle significantly decreased with increasing levels of fertilizer up to 90 kg N + kg P_2O_5/fed.

11. In the first season, varieties showed significant effect on the weight of 1000 grains. Giza 172 surpassed significantly the variety IR 1626 in 1985 season only.

Application of N and P significantly increased 1000-grain weight in the second season only. Increasing fertilizer levels up to 90 kg N + 48 kg P_2O_5/fed. significantly increased the weight of 1000 grains.

12. Rice varieties showed no significant effect on the grain yield/fed. in the two successive seasons. The relative yields were 100 and 96 in the first season, and 100 and 10&1 in the second season for Giza 172 and IR 1626, respectively.

On the other hand, fertilization showed significant effect on the yield of grains in both seasons. The grain yield of rice significantly increased as N and P level increased.

In 1985 season, grain yield significantly increased as the level of fertilizers increased up to 90 kg N + 48 kg P_2O_5/fed. This treatment significantly increased the grain yield by 76 % over the control treatment.

In 1986 season, similar results were obtained in that application of 60 kg N + 48 kg P_2O_5/fed. or 90 kg N + 48 kg P_2O_5/fed. significantly increased the grain yield by 221 and 228 % over the control treatment, respectively.

13. The effect of varieties on the straw yield/fed. showed seasonal variation. In the first season, Giza 172 surpassed significantly IR 1626 only.

In both seasons, fertilizers had significant effect on straw yield/fed. Increasing the level of fertilizer up to the higher level (90 kg N + 48 kg P_2O_5/fed.) significantly increased straw yield compared with the other treatments.

14. Varieties differed significantly in brown rice percentage in both seasons. Variety of Giza 172 produced significantly higher percentage of brown rice than IR 1626 variety.

On the contrary, brown rice percentage was not significantly affected by the application of fertilizers.

15. Varieties had no significant effect on the nitrogen content of flag leaf of heading stage. On the other hand, the tested varieties differed significantly in the percentage of N of rice grains at harvesting. Giza 172 revealed a significant superiority in N % as well as protein content of grains followed by IR 1626.

Contents of nitrogen and crude protein of grains significantly increased with increasing levels of fertilizers. The highest values roduced from application of 90 kg N/fed. without application of P.

16. Varieties differed significantly in percentage of P in flag leaf and rice grains. It is obvious that the P-content was greater in Giza 172 than in IR-1626.

Fertilization with N and P showed significant on P-percentages of flag leaf at heading stage and grains at harvesting. Applications of phosphorous up to 48 kg P_2O_5/fed. (NoP2) resulted in an increase in P % of flag leaf and rice grains. This effect was clearer where no N was applied and decreased as the N level increased.

17. The effect of interaction between rice varieties and fertilization on the all studied characters was not significant. Such result indicates that each experimental factor acted separately in affecting the growth, yield and chemical content of rice.