

SUMMARY

STUDY OF YIELD POTENTIAL OF SOME WHEAT VARIETIES AS AFFECTED BY N FERTILIZATION.

Experiments for studying the effect of nitrogen application levels on wheat yield and its components were carried out at Bahteem Agricultural Research Station during the two successive seasons 1985/ 1986, and 1986/ 1987. The selected old varieties were :

1- Mabrouk; 2- Tosson; 3- Giza 155; 4- Giza 156. Whereas, the new cultivars were 5- Giza 157; 6- Sakha 8; 7- Sakha 61; and 8- Sakha 69. The applied nitrogen levels were zero, 25, 50 and 75 kg N/ faddan in the form urea(46 %N). Split plot design was used in these experiments with four replications. The main plots were assigned for the applied nitrogen levels and the sub plots were devoted for the tested varieties.

Results could be summarized as follows :

1- The new tested wheat varieties were superior to the old ones in flag leaf area. The new varieties showed higher response to nitrogen application compared with the old ones in respect of flag leaf area. Whereas the applied nitrogen levels did not exhibit significant effect on this character. The interaction effect of N x varieties on the flag leaf area was not significant.

2- Number of days to heading of wheat plants was not significantly affected by the applied nitrogen levels in both seasons. However, the new varieties were more earlier in heading as compared with the old varieties. In the first growing season, the effect of N application in delaying heading was more apparent with the new varieties compared with the old ones. Eventhough the interaction effect of N x varieties was not significant, the latest heading date was after 93.25 days for Tosson variety supplied with 50 kg N/ faddan.

3- Maturity of wheat plants was significantly delayed by increasing nitrogen levels only in the first season of experimation. The effect of nitrogen was only evident at the level of 75 kg N/ faddan, where number of days from planting to maturity was increased by about ten days compared with zero, 25 and 50 kg N/ faddan levels. In the first season it was noticed that the new wheat varieties were, in general, earlier in maturity than the old varieties. The earliest variety was Sakha 61 and the latest one was Mabrouk, with a difference of 4.59 days.

. No significant interaction effect of N x varieties was obtained on maturity dates. Averaged over all the tested varieties, it was noticed that maturity in the second season was delayed by 12.67 days compared with the first season.

4- Wheat plant height was not significantly affected by nitrogen levels under the circumstances of this experiment. The four old varieties were significantly taller than the four new varieties. The tallest variety was Mabrouk with an average plant height of 127.50 cm, and the shortest variety was Sakha 69 with an average plant height of 103.5 cm. It could be concluded that the newly introduced wheat varieties were shorter compared with the old ones. No significant interaction effect for nitrogen x varieties on the plant height was obtained in the two seasons.

5- Spike length was not significantly affected by the applied nitrogen levels. There were a significant differences in spike lengths among the tested varieties. Whereas, the interaction effect of N x varieties on this character was not significant.

6- Number of spikelets per spike was not significantly affected by nitrogen levels. There were significant differences in the number of spikelets per spike among the tested varieties in the two growing seasons. In the first season, Giza 155; Giza 157, and Sakha 69 were significantly superior in number of spikelets/ spike compared with Mabrouk; Tosson; Giza 156; and Sakha 61. The interaction effect between nitrogen levels and varieties on number of spikelets per spike was not significant in both of the growing seasons.

in a descending order as Sakha 61, Sakha 69, Sakha 8 then Giza 157. Significant difference was only found between Sakha 61 and Giza 157 in this group. It could be concluded that varieties differed in their potentiality to produce fertile tillers bearing spikes, and the old varieties seemed to be superior in this respect. The interaction effect of nitrogen and varieties was not significant on the number of spikes per square meter.

10- Nitrogen application had no significant effect on 1000-grain weight in both seasons. It could be concluded that the tested varieties differed markedly in 1000-grain weight due to their great differences in their genetic make up and to their grain development behaviour. No significant interaction effect was found for N x varieties on 1000-grain weight in both seasons.

11- Wheat grain yield was affected with the applied nitrogen in the two grown seasons. The application of 25, 50 and 75 kg N/ faddan increased the grain yield by 41, 28 and 39 %, respectively over the control in the first season. The corresponding increases in grain yield in the second season were 14, 20 and 28 %, respectively. On the average of the eight tested varieties, the level of 25 kg N/ faddan was sufficient to induce a considerable grain yield increase.

In the first growing season the very best grain yielding varieties were Sakha 69 (12.45 Ardabs), followed by Giza 157 (12.25 Ardabs) then Sakha 61 (12.05 Ardabs) with no significant differences in between. The previously mentioned three varieties were followed by Sakha 8 (10.85 Ardabs), then Giza 155 (10.05 Ardabs) without significant difference. Meanwhile, the latter two varieties were significantly superior than Mabrouk (9.10 Ardabs), followed by Giza 156 (8.35 Ardabs), then Tosson. The two latter varieties were the worst inferior varieties among the other tested ones with a significant difference in yield between the first and the third variety.

It could be generally concluded that the new varieties outyielded the old ones with one exceptional case for Giza 155 which was one of the best varieties in the second season. Meanwhile Sakha 69 and Sakha 61 ranked on first position in the first and second seasons, respectively. Also Tosson was the least productive variety in both seasons. The present results indicate clearly the superiority of the new wheat varieties, particularly Sakha 61 over the old ones. It was noticed that the new wheat varieties showed higher response to nitrogen levels compared with the old ones.

12- Straw yield of wheat was not significantly affected by nitrogen application levels in the two seasons.

However, considerable increases were recorded in both seasons as a result of increasing nitrogen level. It could be concluded that straw yield was greatly affected by varieties. In general the old varieties were superior to the new ones in this concern showing an opposite trend to grain yield. No significant interaction effect of nitrogen levels x varieties on straw yield was obtained in the two seasons.

13- Significant correlation coefficient at 10% level between grain yield and each of number of grains/spike and spike yield were recorded. positive and highly significant correlation coefficient were obtained between number of grains/ spike and each of spike yield and spike length.

Negative and significant correlation was detected between number of grains/spike and number of spikes/m².