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SUMMARY

Two field experiments were carried out at the Agricultural Research and Experiment Center of the Faculty of Agriculture , Moshtohor, Kalubia Governorate, Zagazig University, Egypt during 1999 / 2000 and 2000 / 2001 seasons. The objective of this study was to investigate the response of some wheat cultivars to different seeding rates and nitrogen levels in regard to growth , yield and yield components of wheat .

Each experiment included 27 treatments which were the combination of three wheat cultivars (Sakha 69 , Sids 1 and Gemmeiza 7), three seeding rates (45 , 60 and 75 kg seeds / feddan) and three level of nitrogen fertilizer (50 , 75 and 100 kg N / feddan). These treatments were arranged in split – split plot design with four replications. The three wheat cultivars were randomly distributed in the main plot, whereas, three seeding rates arranged at random in the sub plots and three N level were assigned at random in the sub-sub plot. Each sub – sub plot area was 10.5 m² (3.5 m long and 3 m wide). Wheat seeds were drilled in rows at 20 cm on 27th and 25th November in the first and second seasons, respectively. The normal cultural practices of growing wheat in the region were followed.

Characters studies :-

A- Growth characters:-

1. Plant height (cm).
2. Flag leaf area (cm²).
3. Peduncle length (cm).
4. Fresh and dry weight of leaves / plant (g).
5. Fresh and dry weight of stem / plant (g).
6. Fresh and dry weight of spike / plant (g).

B- Yield and yield components:-

1. Number of tillers / m².
2. Number of spikes / m².
3. Spike length (cm).
4. Weight of spike (g).
5. Weight of grains / spike (g).
6. Number of spikelets / spike.
7. Number of grain / spike.
8. 1000 – grain weight (g).
9. Straw yield (kg / feddan).
10. grain yield (kg / feddan).

The main results could be summarized as follows:-

A- Varietal differences:-

1. Plant height and peduncle length were significantly affected by wheat cultivars in one season only, the tallest cultivar was Sids 1 and the shortest cultivar was Gemmeiza 7 , whereas, Sids 1 cultivar had the shortest values of peduncle length as compared the other wheat cultivats.
2. Sids 1 cultivar surpassed significantly the other studied cultivars in flag leaf area in the first season. While, Gemmeiza 7 recorded higher values of flag leaf area than Sids 1 and Sakha 69 cultivars in the second season.
3. The three evaluated wheat cultivars varied significantly in fresh and dry weight of the different plant organs in the two growing seasons. Gemmeiza 7 cultivar surpassed significantly Sids 1 and Sakha 69 cultivars in fresh and dry weight of stem , leaves and spike per plant. Whereas, Sakha 69 cultivar gave the lowest values. No significant difference was found between Sakha 69 and Sids 1 cultivars in fresh and dry weight of spike / plant in both seasons,

fresh and dry weight of stem and leaves per plant in the second season.

4. Sakha 69 cultivar had the highest number of tillers and spikes / m^2 . While, the lowest values were produced by Gemmeiza 7 cultivar.
5. Spike characters of Gemmeiza 7 cultivar significantly increased as compared with Sids 1 and Sakha 69 cultivars in both seasons. On the other hand, Sakha 69 cultivar was significantly inferior to all other cultivars under study in spike characters.
6. Gemmeiza 7 cultivar surpassed significantly the other studied cultivars in 1000 – grain weight. On the other hand, no significant difference was found between Sakha 69 and Sids 1 cultivars in 1000 – grain weight in the two growing seasons, whereas the lowest value was recorded by Sids 1 cultivar.
7. No significant differences were found in straw yield per feddan among the tested wheat cultivars in both seasons. Sakha 69 cultivar gave the maximum values of straw yield / feddan. Whereas, the minimum straw yield was of Gemmeiza 7 cultivar in the first and second seasons.
8. The differences among the three cultivars in the mean values of grain yield / feddan were significant in the first season only. In 1999 / 2000 season, Gemmeiza 7 outyielded Sakha 69 and Sids 1 cultivars by 6.92 and 8.57 % , respectively. Also, Gemmeiza 7 cultivar outyielded Sakha 69 and Sids 1 cultivars by 5.04 and 5.01 % , respectively, without significant difference.

B- Effect of seeding rates:-

1. Plant height and peduncle length were not significantly affected by seeding rates in both seasons. The tallest plants and peduncle length were produced from sowing at 75 kg seeds / feddan.

2. Increasing seeding rate from 45 to 60 and 75 kg seeds / feddan significantly decreased flag leaf area by 3.21 and 7.55 %, respectively in the first season. Whereas no significant difference was found among the three rates of seeding in flag leaf area in the second season.
3. Seeding rates significantly influenced fresh and dry weight of the different plant organs in both seasons except fresh and dry weight of leaves / plant in the second season. In general, fresh and dry weight of plant organs were decreased by increasing seeding rate from 45 to 75 kg seeds / feddan.
4. Increasing seeding rates from 45 to 75 kg seeds / feddan caused insignificant increase in number of tillers / m² in both seasons.
5. Number of spikes / m² was significantly increased by increasing seeding rates up to 75 kg seeds / feddan in the second season. Whereas, no significant difference was found between the three rates of seeding in number of spikes / m² in the first season.
6. Spike length and weight of grains / spike were significantly decreased by increasing seeding rate up to 75 kg seeds / feddan in the second season only.
7. Number of spikelets / spike and number of grains / spike were not significantly affected by seeding rates in the two growing seasons.
8. The effect of seeding rate on the mean values of spike weight was significant in both seasons. In the first season, increasing seeding rate from 45 to 60 and 75 kg seeds / feddan significantly reduced spike weight by 6.33 and 10.13 %, respectively. Whereas , no significant difference was found between 45 and 60 kg seeds / feddan in spike weight. Also, in the second season, raising the rates of seeding significantly decreased spike weight by 4.35 and 8.91 % , respectively.

9. Weight of 1000 grains was significantly decreased by increasing seeding rate from 45 to 75 kg seeds / feddan in the two growing seasons.
10. Increasing seeding rate from 45 to 60 and 75 kg seeds / feddan significantly increased straw yield by 3.4 and 6.4 %, respectively in the first season. Whereas, in the second season, increasing the same rate of seeding increased straw yield / feddan by 3.5 and 7.1 %, respectively.
11. Grain yield / feddan significantly increased by 2.65 and 5.77 % in the second season due to increasing seeding rate from 45 to 60 and 75 kg seeds / feddan , respectively. Whereas, in the first season , raising the same rates of seeding insignificantly increased grain yield / feddan by 4.50 and 7.76 %, respectively.

C- Effect of N levels:-

1. Plant height, fresh and dry weight of stem, leaves and spike / plant were highly significantly increased by increasing N level up to 100 kg N / feddan in the two growing seasons. Whereas, no significant difference was found between adding 75 and 100 kg N / feddan in fresh and dry weight of leaves and spike / plant in the second season.
2. Nitrogen application had no significant effect on peduncle length in both seasons.
3. The application of 75 and 100 kg N / feddan significantly increased flag leaf area by 5.15 and 7.18 % over adding 50 kg N / feddan , respectively in the first season. Whereas, raising N level from 50 to 75 and 100 kg N / feddan insignificantly increased flag leaf area by 2.55 and 4.20 %, respectively in the second season.
4. Number of tillers and spikes / m² were significantly increased by increasing N level up to 100 kg N / feddan in both seasons. The increase in N level from 50 to 100 kg N / feddan significantly

increased number of spikes / m² by 9.73 and 9.25 % in the first and second seasons, respectively.

5. Nitrogen levels had a significant effect on spike characters i.e. spike length , number of spikelets / spike, spike weight , weight of grain / spike and number of grains / spike in 1999 / 2000 and 2000 / 2001 seasons. Whereas no significant differences were found between adding 75 and 100 kg N / feddan in spike length , number of spikelets / spike, spike weight and number of grains / spike in the second season and weight of grain / spike in both seasons.
6. The increase in N level significantly increased 1000 – grain weight in one season only.
7. Straw yield and grain yield per feddan were significantly and consistently increased by increasing N level from 50 to 100 kg N feddan in the two growing seasons. The increase in N level from 50 to 100 kg N feddan significantly increased grain yield / feddan by 9.14 and 9.25 % in the first and second seasons, respectively.

D- Interaction effects:-

All the interactions between cultivars and seeding rates, cultivars and N level , seeding rates and N levels as well as between the three factors of study on growth attributes, yield and yield components of wheat did not reach the 5 % level of significance.