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SUMMARY

Two field experiments were carried out at the experimental farm of faculty of Agriculture (Saba Bacha) Alexandria, Univ. Alex. Egypt during the two successive seasons of 2008 and 2009.

The main objective of the investigation was to study the performance of Sakha 104, Giza 182 and Giza 178 rice cultivars by six N mineral in combination with organic fertilizer (0%, 100% N, 75% N + 25 % FYM, 75% N=25% compost, 50% N+50% N FYM, 50 % N + 50% compost) as far as their vegetative growth, yield and yield components and grain quality.

A split-plot design with three replication was used the main plots were devoted in rice cultivars and N mineral in combination with organic fertilizer were arranged at random on the sub-plots.

The planting date was 15th May in 2008 and 2009 seasons, respectively. The transplanting was done 30 days after sowing.

The main studied characters were arranged as follow:

A- Growth characters:

   1- Dry matter accumulation (gm/m^2).

   2- Leaf area index (LAI).

   3- Crop growth rate (CGR).

   4- Relative growth rate (RGR).

   5- Net assimilation rate (NAR).

   6- Days of heading (day).

   7- Number of tillers /m^2.

   8- Plant height at harvest (cm).

   9- Panicle length (m).

   10- Number of spikelet /panicle.

B- <u>Yield and yield attributes:</u>

1- Number of panicles/m^2.

2- Number filled grains/ panicle.

3-1000 grain weight (gm).

4- Grain yield (t/fed).

C- <u>Some yield related characters</u> :

1- Straw yield (t/fed).

2- Biological yield (t/fed).

3- Harvest index (HI).

D- <u>Grain quality characters:</u>

1- Grain dimension characters:

a- Grain length (mm),

b- Grain width (mm),

c- Grain Shape (L/W ratio)

2- Milling recovery:

a. Hulling percentage.

b. Milling percentage.

c. Broken percentage.

3-Chemical and cooking quality characters:

a. Amylose contents.

b. Gel consistency.

c. Kernel elongation %.

d. Cooking time (min).

The result could be summarized as follows:

A- Growth Characters:

1- Effect of rice cultivars

The three tested rice cultivars significantly varied in their growth characters i.e. dry matter accumulation, leaf area index, crop growth rate, relative growth rate, net assimilation rate , number of tiller/m^2 and days of heading at four growth stages in 2008 and 2009 seasons.

Giza 182 rice cultivar had the greatest value of value of dry matter accumulation, leaf area index, crop growth rate and number of tillers/m^2. Also Sakha 104 significantly surpassed the other two rice cultivars in relative growth rate and heading days. Whereas Giza 178 gave the highest net assimilation rate.

2- Effect of N mineral and Organic fertilizers

The N mineral in combination with organic level significantly affected all studied growth characters, 100 % N gave the highest dry matter accumulation leaf area relative growth rate, day of heading and number of tillers at all growth stages in both seasons

3- Interactions effect

The highest values of dry matter accumulation leaf area index. and number of tillers obtained by Giza182 when received the 100% N, while Sakha 104 gave the highest days o heading by application 100% N . in both seasons.

B- Yield and yield components:

1- Effects of rice cultivars

Rice cultivars significantly affected yield and it components in both seasons. Giza 182 rice cultivar surpassed the other two cultivars in number of panicles/m2, panicle length, number of grains/ panicle, number of filled grains/panicle, grain yield in 2008 and 2009 seasons. While Shakha 104 cultivar gave the highest value of plant height at harvest and 1000 grain weight in both seasons.

2- <u>Effect of N mineral combination with organic fertilizer</u>:

All yield and yield components characters were significantly affected by N mineral + organic level in both season. Increasing N mineral up to 100 % and 50 % N + 50% compost gave the highest values all studied characters.

3-<u>Interaction Effect</u>

Sakha 104 rice cultivar produced the highest the plant height at harvest, number of panicles/m2., under fertilizer by (100% N) in both seasons. While Giza 182 gave the highest panicle length, number of grain/panicle and grain yield/fed under 75 N +25 % compost and 50% N + 50% compost in both seasons. The best combination was Sakha 104 under 50% N + 50 % compost of number of panicle /m2 and 1000 grain weight in both seasons.

C- <u>Some yield related characters</u>:

1- <u>effects of rice cultivars</u>

Rice cultivars significantly affected some yield and it components (straw yield, biological yield) in both seasons. Giza 182 rice cultivar surpassed the other two cultivars in straw yield, biological yield (t/fed), in 2008 and 2009 seasons.

2- <u>Effect of N mineral combination with organic fertilizer</u>:

Some yield and yield components characters were significantly affected by N mineral + organic level in both season. Increasing N mineral up to 100 % and 50 % N + 50% compost gave the highest values all studied characters.

3 -<u>Interaction Effect</u>

While Giza 182 gave the highest straw yield (t/fed), under 75 N +25 % compost and 50% N + 50% compost in both seasons. The best combination was under 50% N + 50 % compost, under 50% N + 50 % FYM of biological yield (t/fed) , harvest index in both seasons.

D- Grain quality characters:

a- Grain dimensions characters:

1- Effect of rice cultivar

The three tested cultivars significantly varied in their grain length, grain width and grain shape in both seasons. Giza 182 cultivar produced the longest paddy and milled grain length, while Sakha l 04 gave the highest grain width and Giza 182 cultivar produced the lowest grain width. Also Giza 182 recovered the maximum paddy and milled grains shape. While the minimum value was found for Sakha 104 in 2008 and 2009 seasons.

2- Effect of N mineral in combination with organic

N. mineral with organic fertilizer had a significant effect on all studied character of grain dimensions during the two seasons. Increasing N mineral level from 50 % up to 100 % N increased paddy and milled yield grains width and 50 N% + 50 % compost increased grain length. While application of 75 % N + 25% FYN gave the highest grain shape.

3- Interaction effect

The interaction was not significant between the variables under study for the dimensions of the bean recipe with the exception of the length of the bean in both seasons, where 2009.2008 Giza 182 showed the highest value for the recipe along the grain and Giza 178 showed the lowest value.

b- Milling recovery :

1- Effect if rice cultivars

Rice cultivars showed in significant effect on hulling % , milling % and broken %, in 2008 and 2009 seasons. Shaka 104 rice cultivar produced the highest values of hulling % ad milling % in both seasons, while Giza 182 rice cultivar gave the highest of broken % in both seasons.

2- Effect of N mineral + organic fertilizer

Application of 100% N and 50 % + 50 % compost gave the highest hulling% and milling % in both seasons. While broken % was significantly decreased by increasing N levels with organic fertilizer.

3- Interaction effect

Sakha 104 cultivar gave the highest hulling (%) and milling (%) under the 50 (%) N + 50 (%) compost treatment in both season. While Giza 182 rice cultivar gave the highest broken % with the check treatment.

C- Chemical components :

1- effect of rice cultivars

Rice cultivar significantly varied in their grain amylose content, gel consistency, elongation rate (%) and cooking rate . Giza 182 cultivars produced the highest value of amolyase content and cooking rate. While Sakha 104 rice cultivar gave the highest gel consistency and elongation rate (%) in both seasons.

2- Effect of N. mineral + organic fertilizer

Increasing N mineral (100%) and 50 (%) N + 50 (%) compost gave the highest amylose content, gel consistency and elongation rate % in both seasons.

3- Interaction effect:

Giza 182 rice cultivar gave the highest amylose content and cooking time. While sakha 104 cultivar produced the highest gel consistency and elongation rate % in both seasons