

CONTENTS

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	3
MATERIALS AND METHODS	31
RESULTS AND DISCUSSION	40
A-Growth Characters	
A.1. Leaf area index (LAI).	40
A.2. Dry matter production.	46
A.3. Chlorophyll content.	52
A.4. Heading date.	58
B- Yield and yield attributes	
B.1. Plant height.	60
B.2. Tillers numbers/m ²	65
B.3. Panicle weight (g).	69
B.4. Panicle number/ m ²	72
B.5. Filled grains/panicle.	75
B.6. Unfilled grains/panicle.	79
B.7. Harvest index.	81
B.8. 1000-grain weight (g).	83
B.9. Grain yield.	86
B.10. Straw yield.	91
C- Grain Quality traits	
C.1. Hulling %	94
C.2. Milling %.	96
C.3. Head rice %.....	102
C.4. Protein content.	103
SUMMARY	106
LITTERATURE CITED.	113
ARABIC SUMARY.	

SUMMARY

Two field experiments were conducted at the farm of Agricultural Research Station at Sakha, Kafr El-Sheikh, Egypt during 2001 and 2002 seasons. The current study aimed to study the effect of three sowing dates ; May 15th, May 30th and June 15th and three seed rates; 30, 40 and 50 kg seed/fed on growth, yield components, yield and grain quality of drill seeded three rice cultivars; Sakha 103, Sakha 104 and Giza 182. The present study were laid out into split-split-plot design with four replication.

The main studied characters were arranged as follows:

A. Growth traits:

The following characteristics were determined at heading stage.

- A.1- Leaf area index (LAI).
- A.2- Dry matter production (DM) g/m².
- A.3- Chlorophyll content (SPAD – Value).
- A.4- Heading date.

B- Yield and yield attributes :

These studied traits were estimated at harvest time:

- B.1- Plant height (cm).
- B.2- Tillers number /m².
- B.3- Panicles number/m².
- B.4- Panicle weight (g).
- B.5- Number of filled grains/panicle.
- B.6- Percentage of unfilled grain.
- B.7- Harvest index.
- B.8- 1000-grain weight (g).

B.9- Grain yield (t/ha).

B.10- Straw yield (t/ha).

C. Grain quality :

C.1- Hulling percentage.

C.2- Milling percentage.

C.3- Head rice percentage.

C.4- Grain yield content.

The most important results could be summarized as follows:

A. Growth characteristics:

Regarding the effect of sowing date on growth traits, it was recorded that the three tested sowing dates significantly affected all studied growth traits.

Likewise, delaying sowing date sharply decreased the leaf area index, dry matter production and chlorophyll content. In addition, delaying sowing date up to June 15th significantly reduced the period from sowing to heading. Generally, the sowing date of June 15th gave the lowest values of all above mentioned traits.

For the effect of seeding rates on growth characters, the three tested seed rate pronounced influenced the studied growth characters. The higher seed rate of 50 kg seed /fed gave the largest leaf area index and highest value of dry matter production as well as period from sowing to heading . On the other hand the lower seed rate of 30 kg seed/fed gave the lowest values of them. The higher seed rate of 50 kg seed/fed. gave the highest value of chlorophyll

content without any significant differences with those produced by the seed rate of 40 kg seed/fed.

With respect to rice cultivar performance, the three tested rice cultivars significantly varied in their growth characters. i.e. LAI, dry matter production, chlorophyll content and heading date.

Sakha 104 rice cultivars performed better regarding the growth characters. Both Sakha 103 and Giza 182 rice cultivars had the same level of significance in leaf area index and dry matter production as well as chlorophyll content. The longest period from sowing to heading was obtained by Sakha 104 followed Giza 182 . while, Sakha 103 had the shortest period from sowing to heading.

The interactions between sowing dates and seeding rates had significant effect on leaf area index, dry matter production and chlorophyll content during both seasons.

In the same time, the interaction between sowing dates and rice cultivars had positive effect on leaf area index and dry matter production in 2002 season while on chlorophyll content in 2001 season. The highest values of former traits were obtained by Sakha 104 when it was early sown at May 15th . In addition, the interaction between rice cultivars and seeding rates had useful effect on dry matter production in 2001 and chlorophyll content in both seasons. Rice cultivar sakha 104 gave the highest values of above mentioned traits when it was seeded by seed rate of 50 kg /fed. Meanwhile, the lowest values of them were obtained by Sakha 103 with 30 kg seed/ fed. The tri-interaction had pronounced effect on

chlorophyll content and leaf area index in only one seasons while on dry matter production in both seasons. Generally, the best combination was Sakah 104 with early sowing date of May 15th and 50 kg seed in growth character i.e. dry matter production and leaf area index as well as chlorophyll content particularly with 40 kg seed/fed.

B- Yield and yield attributes:

Concerning the effect of sowing dates on yield and yield attributes, it was claimed that the sowing dates significantly affected plant height, tillers number /m², panicles number/m² unfilled grains/panicle , filled grains/ panicle weight,100- grain weight, grain yield and straw yield in both seasons. In general speaking, the early sowing date of May 15th gave the lowest values of all above mentioned traits. Moreover, the highest values of all studied yield and yield attributing were obtained when rice crop was sown at June 15th.

As for seeding rates effect, it was detected that all yield and yield attributes were significantly affected by seeding rates in both seasons. The longest plants were obtained by seed rate of 50 kg seed /fed. The highest values of panicles number and tillers number/m² were produced by the medium seed rate. The highest values of number of filled grains/panicle weight and 1000-grain weight were produced by the low seed rate. By the way, the seed rate of 40 kg seed/fed gave the highest values of grain yield followed by seed rate of 50 kg seed /fed. the high seed rate of 50 kg seed/fed confirmed its inferiority in yield attributes. The harvest

index didn't show any significant response under both varieties seeding rates and sowing dates.

For rice cultivars performance, from forgoing discussion the three tested rice cultivars significantly differed in their yield and yield attributes in both seasons. It is the fact that Sakha 104 rice cultivar surpassed other two cultivars. Whereas it gave the highest values of plant height, tillers number/m², panicle length, panicles number/m², panicle weight, number of filled grains/panicle, 1000-grain weight, grain yield and straw yield as well as harvest index. In continuation, Sakha 104 gave the lowest value of unfilled grains/panicle Giza 182 rice cultivar gave the lowest values of plant height, panicle weight, filled grains/panicle and 1000-grain weight. Mean while, Sakha 103 rice cultivar had the lowest values of tillers number/m² panicles number/m², grain and straw yields, and harvest index the highest value of unfilled grains/panicle.

Concerning the interaction effect, the interaction between sowing dates and seeding rates had significant effect on plant height in 2002 season, tillers number /m² and panicles number in both seasons. Also, the interaction between sowing dates and seeding rates had significant on 1000-grain weight and grain yield in 2002 as well as on straw yield in both seasons. The best combination was early sowing date of May 15th and 40 kg seed/fed.

In continuation, the interaction between sowing dates and rice cultivar had positive effect on plant height and tillers number/m², panicles number/m² in both seasons and on grain yield/m² 2001 season. The best combination was Sakha 104 rice cultivar with seed

rate of 40 kg seed/fed. The interaction between seed rates and rice cultivar had significant effect on plant height in 2002 season, number of filled grain in both seasons, As it was before detected, the best combination was Sakha 104 rice cultivar with 30 or 40 kg seed /fed. The rest of interactions failed to exert any significant effect on yield and yield attributes.

C. Some of grain quality traits :

The sowing dates significantly affected hulling% milling %, head rice % and protein content in both seasons. The early sowing date of May 15th had the optimum grain quality whereas, it gave the highest values of them. On contrary, the late sowing date exerted bad grain quality.

Regarding the effect of seeding rates on grain quality, three tested seed rates had distinct effect on all grain qualities. The low seed rate of 30 kg seed had considerable grain quality without any significant differences with those produced by seed rate of 40 kg seed /fed. the high seed rate gave the bad grain quality whereas it gave the lowest values of them.

For rice cultivar performance in the grain quality the three tested rice cultivars significantly varied in their grain quality traits. Sakha 104 rice cultivar surpassed the other two rice cultivars in tested grain quality. Giza 182 rice cultivar had the lowest values of hulling %, milling % and head rice % .

The protein content didn't significantly vary among the three tested rice cultivars.

With respect to the interaction effect, the interaction between sowing dates and seeding rates had marked effect on milling % and protein content in both seasons. The best combination was the early sowing date of May 15th and seed rate of 30 kg seed/ fed.

The interaction between sowing dates and rice cultivar had significant effect on milling % in 2001 season. The highest milling % was produced by Sakha 104 rice cultivar when it was sown at May 15th . The lowest value of milling % was exerted by Giza 182 rice cultivar when it was sown at late sowing date of June 15th .

In addition, the interaction between seeding rates and rice cultivars had significant effect on milling % in the first season. The optimum milling % was given by Sakha 104 when it was seed by the low seed rate of 30 kg seed/fed. Mean while, the lowest value of milling % was produced by Giza 182 when it was seeded by high seed rate of 50 kg seed/fed.