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# THE IMPACT OF RICE HUSK AS AN ORGANIC FERTILIZER ON TWO EGYPTIAN RICE CULTIVARS.

**Nessreen N. Bassuony**

**Rice Research Section Sakha-Kafr EL-sheikh, Field Crops Research Institute, A.R.C.**

## ABSTRACT

Two field experiments were carried out at the Experimental Farm of Rice Research& Training Centre, Sakha, Kafr-El-Sheikh, Egypt, during the two successive summer seasons, 2012 and 2013, to study the effect of rice husk as an organic fertilizer on the performance of two Egyptian rice cultivars. A strip plot design with three replication was used. Rice cultivars (Sakha 106 and E. hybrid rice1) were occupied the horizontal plots .While four rates of fully grounded rice husk (0, 5, 7 and 9 Ton /ha) were devoted to the vertical plots. Growth, yield, yield components, and grains quality characters of two rice cultivars were investigated.

The results showed that the mean values of all the studied characters except cooking and eating quality characters were significantly affected by rice cultivars. Different responses to rice husk rates were obtained for the all studied characters. In most cases, The mean values of these characters increased by increasing rice husk rates and maximized at the rate of 9.0ton /ha., and no significant was found between 7 ton/ha and 9 ton/ha, while, number of days to 50% heading and cooking and eating quality didn't affected by rice husk at any rate in both seasons. The interaction between cultivars and rice husk rates under study had significant effect on most tested characters, it was detected in two or/and one season of study. Meanwhile, this type of interaction was not significant regarding all grain quality characters in the two seasons of study. This study suggested that rice husk could be applied as organic fertilization (7 ton /ha) with 50% of recommended dose of nitrogen (72 kg N\ha).

## INTRODUCTION

Rice is the most important food for more than 50% of the world's population, and it is grown on almost 155 million ha of the worldwide (Kögel-Knabner *et al*., 2010). In recent years, organic farming and organic rice becoming popular among the farmers and consumers since it is eco-friendly, tastes better, superior in quality, more nutritious and safer than conventionally produced rice. To produce environmentally-friendly rice, chemical use should be reduced. One method of reducing the use of chemical fertilizers is through the use of an organic fertilizer. An organic fertilizer plays an important role in maintaining the soil quality and sustainability of agricultural systems. Also the organic wastes improve the soil structure. Rice husk is one of the most widely available agricultural wastes in many rice producing countries of the world. Rice hulls (or rice husks) are the hard protecting coverings of grains of rice and removed from rice seed as a by-product during the milling process. Utilization of paddy husks that is an important problem in paddy agriculture and is a residual after paddy harvest, is important in terms of recycling to agricultural lands by composting, as well as ensuring sustainability of soil productivity and also contributing to production by improving physical and chemical properties of soils. In the other word, rice husk is a complementary potential fertilizer source that is suitable for rice plant. Oaring a research by using rice husk cause to increasing in yield and a resistant product. Abo-

Soliman *et al*. (1990) reported that rice husk under different irrigation intervals can give good rice stand, better grain yield and higher water use efficiency. Ebaid and El-Refaee (2007) found that grain yield and its components were significantly increased by application of rice husk up to 9.6 tons/ha. Furthermore, Rabah *et al*. (2011) found that rice cultivars showed a significant difference regarding hulling%, and broken percentage.

Accordingly, the present study aimed to investigate the performance of some Egyptian rice cultivars under different levels of rice husk as an organic fertilizer, with using half amount of nitrogen fertilizer.

## MATERIALS AND METHODS

Two field experiments were carried out at the Experimental Farm of Rice Research & Training Centre, Sakha, Kafr-El-Sheikh, Egypt, during the two successive summer seasons of 2012 and 2013, to study the effect of rice husk as an organic fertilizer on the performance of two Egyptian rice cultivars. A strip plot design with three replication was used, rice cultivars (Sakha 106 and E. hybrid rice 1) were occupied the horizontal plots. While four rates of fully grounded rice husk (0, 5, 7 and 9 Ton /ha) were devoted to the vertical plots. Rice husk was applied to the dry soil. The previous crop was wheat in both seasons.

Half of the recommended dose of nitrogen fertilizer (Nitrogen in the form of Urea (46%N) was added at the rate 72 kg N \ha.)Was added as a dry soil application during land preparation. Three to four of 25 days old seedlings, were transplanted in hills spacing of 20 x 20 cm distance among hills and rows on June 5$^{th}$ in both seasons. The experimental unit area was 10m²(2x5m). All other cultural practices were done as recommended. Number of days 50% to heading was determined as a number of days from date of sowing to 50 % appearance of panicles.

At harvest, plant height (cm) and number of productive tillers was estimated from ten guarded hills and, then conformed to numbers/hill. Ten panicles were randomly selected from each guarded hill to determine panicle length (cm), panicle weight (g), number of spikelets /panicle, number of filled grains/panicle and. Ten guarded square meters were harvest manually and left three days for air drying. Air dried plants were mechanically threshed and grain yield was estimated and adjusted to 14 % moisture content. Grain samples from each plot were taken to determine 1000- grain weight and 150 grams (three replications) of rough rice for all samples were taken and well mixed and cleaned to test the grain quality characters.

Milling recovery characters i.e. hulling, milling and head rice percentages were estimated according to the methods reported by Adair (1952). Cooking and eating quality characters i.e. gelatinization temperature, amylose content % and kernel elongation were estimated following the methods of Little *et al*., (1958). Juliano (1971), Azeez and Shafi (1966), respectively. All data collected were subjected to analysis of variance according to Gommez and Gomez (1984). Treatments means were compared by Duncan's multiple range test (Duncan, 1955). All statistical

analysis was performed using variance technique by means of "MSTAT" computer soft war package.

## RESULTS AND DISCUSSION

**I- Agronomic characters:**

Results in Table 1 showed that the mean values of all the agronomic characters under studied were significantly affected by rice cultivars except plant height; it was not significant in both seasons. Minimum number of days to 50% heading was recorded by Sakha 106. However, the maximum number of days to50% heading was observed by the E. hybrid rice1.In addition panicle length and panicle weight was differed significantly in the two seasons of study as influenced by cultivars. These results attributed to the differences between the two cultivars in respect to their genetic background. Similar findings were claimed by Li- ZL *et al*. (1991), Babu-BTR *et al*. (2000).

Furthermore, different responses to husk rates were obtained for the agronomic characters Table 1 Data show that number of days to 50% heading was not significantly increase by increasing rice husk rates in both seasons. Meanwhile, plant height, panicle length and panicle weight were differed significantly in the two seasons of study as affected by application of husk to the soil. Obviously, the mean values of such characters were increased significantly by increasing husk rates and maximized at the rate of 9 ton /ha. These results could be attributed to increasing husk rates might be improved the soil texture and as a result increased the availability of soil nutritional elements that caused better growth. Similar findings were Claimed by Ebaid at *al*. (2004).In addition, Table1 indicated that insignificant differences were found between the two fertilization levels i.e.7 ton /ha and 9 ton/ha regarding all studied agronomic characters in both seasons.

**Table 1: Effect of rice cultivars and husk rice rates as well as their interaction on agronomic characters during 2012 and 2013 seasons.**

| Characters / Treatments | Days to 50% heading(days) | | Plant height(cm) | | Panicle length(cm) | | Panicle weight(g) | |
|---|---|---|---|---|---|---|---|---|
| | 2012 | 2013 | 2012 | 2013 | 2012 | 2013 | 2012 | 2013 |
| Rice cultivars (V) | | | | | | | | |
| Skha 106 | 98 b | 98 b | 109 | 98.76 | 20.74b | 20,58b | 4.08b | 3.88b |
| E.hybrid rice 1 | 104 a | 106 a | 110 | 96.7 | 23.58a | 23.47a | 4.92a | 4,67a |
| F-test | ** | ** | Ns | Ns | ** | ** | ** | ** |
| Rice husk rates (R) | | | | | | | | |
| 0 Ton /ha | 102 | 100 | 106 c | 93.95 b | 21.17c | 21.50b | 3.87b | 3.27c |
| 5 Ton /ha | 101 | 103 | 1o7 bc | 96.47ab | 22.02bc | 21.72b | 4.40ab | 3.86bc |
| 7 Ton /ha | 101 | 102 | 111.47ab | 100.16a | 22.3ab | 22.1ab | 4.70ab | 4.18ab |
| 9 Ton /ha | 102 | 102 | 112.1 a | 100.45a | 23.15a | 22.78a | 5.02a | 4.78a |
| F-test | Ns | Ns | * | ** | ** | ** | * | * |
| Interaction VXR | Ns | ** | Ns | * | * | * | Ns | * |

***,** and Significant and highly significant at P < 0.05, P< 0.01,respectively.-NS: Not significant. -Means followed by a common letter are not significantly different at the 5% level by DMR test.**

The interaction between cultivars and husk rates under study had significant effect on number of days to 50% heading, plant height and panicle

weight in the second season only. However, this type of interaction was significantly affected panicle length in both seasons. Results in Table 2 indicated that E. hybrid rice 1 cultivar with all rates of husk rice recorded the maximum number of days to 50% heading. While, Sakha 106 with 0 ton /ha gave the minimum number of days to 50% heading in the same season. In addition results in Table 2 indicated that Sakha 106 with 9 ton /ha gave the tallest plants. While, the shortest plant height was obtained from E. hybrid rice 1 with 0 ton/ha in the same season. Further, Table 2 showed clearly that the heaviest panicle weight was obtained when E. hybrid rice 1 was treated by 9 ton /ha., meanwhile, the lightest one was obtained by Sakha 106 with 0 ton /ha. on the other hand, data in Table 3 showed that the longest panicle was obtained by sowing E. hybrid rice 1with 7 and 9 ton /ha in the first and second seasons, respectively. While, the shortest panicle was obtained when Sakha 106 was fertilized by 0 ton /ha in both seasons.

**Table 2: The interaction between rice cultivars and rice husk rates on days to heading, plant height, and panicle weight during 2013 season.**

| Rice cultivars and characters | 2013 | | | |
|---|---|---|---|---|
| | Rice husk rates(ton/ha) | | | |
| | 0 | 5 | 7 | 9 |
| No. Days to 50% heading | | | | |
| Sakha 106 | 94.67d | 101b | 99,0c | 98.33c |
| E.hybrid rice 1 | 105.67a | 105,67a | 105,67a | 105.33a |
| Plant height | | | | |
| Sakha 106 | 93.47c | 93.13c | 96.23abc | 100.22a |
| E.hybrid rice 1 | 88,43d | 93.80c | 94.10bc | 98.47ab |
| Panicle weight | | | | |
| Sakha 106 | 3.50c | 4.07bc | 3.97bc | 4.0bc |
| E.hybrid rice 1 | 4.47b | 4.23b | 4.4b | 5.57a |

**- Means followed by a common letter are not significantly, different at the 5% level by DMR test.**

**Table 3: The interaction between rice cultivars and rice husk rate on panicle length (cm) during 2012and 2013 seasons.**

| Rice cultivars | Season 2012 | | | | Season 2013 | | | |
|---|---|---|---|---|---|---|---|---|
| | Rice husk rates(ton/ha) | | | | | | | |
| | 0 | 5 a | 7 | 9 | 0 | 5 | 7 | 9 |
| Sakha 106 | 19.83d | 20.87c | 20.17cd | 22.10cd | 20.00d | 20.67cd | 20.53d | 21.33c |
| E.hybrid rice 1 | 22.50b | 23.17b | 24.43a | 24.20a | 23.00b | 22.76b | 23.87a | 24.23a |

**Means followed by a common letter are not significantly, different at the 5% level by DMR test.**

**II-Grain yield and yield components:**

It is clear from Table 4 that the differences between the mean values of the two cultivars under study were significant and/ or highly significant for all grain yield and its components in the two seasons of study. Hybrid rice had 20% more panicles/m² than conventional rice, E. hybrid rice 1 gave the highest number of filled grains/panicle and the highest grain yield while, Sakha 106 gave the heaviest 1000-grain weight in both seasons. These differences could be attributed to genetic variation of the two utilized cultivars

under investigation. These results were agreed with those reported earlier by Maiti *et al* (2003), Ebaid *at al*. (2004).

**Table 4: Effect of rice cultivars and husk rice rates as well as their interaction on grain yield and yield components during 2012 and 2013 seasons.**

| Characters / Treatments | No of panicles/hill | | No. of filled grains /panicle | | 1000-grain weight (gm) | | Grain yield (ton /fed) | |
|---|---|---|---|---|---|---|---|---|
| | 2012 | 2013 | 2012 | 2013 | 2012 | 2013 | 2012 | 2013 |
| Rice cultivars (V) | | | | | | | | |
| Skha 106 | 16.05b | 16,o1b | 134.09b | 128.92b | 29.5a | 29.8a | 4.15b | 4.53b |
| E.hybrid rice1 | 18.48a | 17.89a | 177.08b | 157.0a | 24.3b | 24.9b | 4.42a | 4.73a |
| F-test | * | * | ** | ** | ** | * | * | * |
| Husk rates (R) | | | | | | | | |
| 0 Ton /ha | 15.37c | 15.4b | 142.33b | 127.5b | 25.2c | 26.0b | 3.97b | 3.75c |
| 5 Ton /ha | 16.67bc | 16.4b | 148.67ab | 142.5ab | 25.5bc | 26.8ab | 4.02b | 4.6b |
| 7 Ton /ha | 17,73ab | 17.62a | 164.83a | 144.5a | 27.5ab | 27.5ab | 4.02a | 4.7ab |
| 9 Ton /ha | 19,3a | 18.33a | 166.59a | 157.33a | 29.3a | 28.3a | 4.62a | 5.47a |
| F-test | * | ** | * | ** | ** | * | ** | ** |
| Interaction VXR | * | ** | Ns | * | ** | Ns | ** | ** |

***,** and Significant and highly significant at P < 0.05, P< 0.01,respectively.-NS: Not significant. -Means followed by a common letter are not significantly different at the 5% level by DMR test.**

Meantime, the results in Table 4 illustrated indicated that significant and/or highly significant increase trend was occurred in the mean values of all grain yield and its components characters by increasing the husk rates, which was maximized at 9 tons /ha, it is worthy to note that mean value of all yield and its components characters did not affect significant when rice husk fertilizer level increased from 7 to 9 ton /ha .Whereas, the lowest mean values were obtained at 0 ton /ha. level in the two seasons of study. The increases in grain yield and its components under rice husk rates could be attributed to the effect of rice husk on enhancing the plant roots to expanding through the soil consequently, increasing the efficiency of rice plants for nutrients absorption in the root zone. Similar results were reported by Awad (2001) and El-Refaee *et al.* (2006).

Also, the interaction between rice cultivars and husk rice rates significantly affected the number of panicles/hill and grain yield in both seasons, while this interaction effects were significant in 2012 season only in case of 1000-grain weight and for number of filled grains/ panicle only in 2013 season. Results in Table 5 indicated that E. hybrid rice1 cultivar with all rates of rice husk recorded the maximum number panicles/hill and number of filled grains/panicle and grain yield. While, Sakha 106 with 0 ton /ha gave the minimum mean values of same characters in the same season. In addition results in Table 5 indicated that Sakha 106 with 9 ton /ha gave the heaviest1000-grain weight in 2012 season. While, the lightest weight was obtained from E. hybrid rice1 with 0 ton/ha in the same season.

**Table 5: The interaction between rice cultivars and rice husk rates on grain yield and its components during 2012 and 2013 seasons.**

| Rice cultivars | Season 2012 | | | | Season 2013 | | | |
|---|---|---|---|---|---|---|---|---|
| | Rice husk rates(ton/ha) | | | | | | | |
| | 0 | 5 | 7 | 9 | 0 | 5 | 7 | 9 |
| No. panicles/hill | | | | | | | | |
| Sakha 106 | 13.53c | 15,60c | 17.67b | 17.40b | 14.57g | 15.70ef | 17.23b | 16.53de |
| E.hybrid rice1 | 17.20b | 17.73b | 17.80b | 21.20a | 15.10fg | 18.33b | 18.0bc | 20.13a |
| Filled grains/panicle | | | | | | | | |
| Sakha 106 | Ns | Ns | Ns | Ns | 123.33d | 130.33cd | 127.0d | 140.0c |
| E.hybrid rice 1 | Ns | Ns | Ns | Ns | 131.67cd | 154.67b | 167.0ab | 174.0a |
| 1000grainwieght(g) | | | | | | | | |
| Sakha 106 | 26.0c | 26.0c | 31.0b | 35.0a | Ns | Ns | Ns | Ns |
| E.hybrid rice 1 | 24.0c | 25.0c | 24.0c | 23.36 | Ns | Ns | Ns | Ns |
| Grain yield ton/Fed | | | | | | | | |
| Sakha 106 | 3.2c | 4.33ab | 4.7ab | 4.76a | 3.13d | 4.03c | 4.70bc | 6.23a |
| E.hybrid rice1 | 4.26ab | 3.7bc | 4.8a | 4.48ab | 4.37c | 5.17b | 4.70bc | 6.70a |

**Means followed by a common letter are not significantly, different at the 5% level by DMR test.**

**III- Grain quality characters:**

Under this topic the present investigation concerned with milling characters and Cooking and eating characters

**a- Milling characters:**

Results in Table 6 indicated that a significant difference between the mean values of two rice cultivars concerning all milling characters in 2012 and 2013. From this Table it is clear that Sakha 106 surpassed significantly the other cultivar in both seasons. These results attributed to the differences between these cultivars in respect to their genetic background.

**Table 6: Effect of rice cultivars and husk rice rates as well as their interaction on milling recovery characters during 2012 and 2013 seasons.**

| Characters / Treatments | Hulling % | | Milled rice % | | Head rice % | |
|---|---|---|---|---|---|---|
| | 2012 | 2013 | 2012 | 2013 | 2012 | 2013 |
| Rice cultivars (V) | | | | | | |
| Skha 106 | 81.90a | 80.59a | 70.89a | 70.91a | 63.18a | 62.52a |
| E.hybrid rice1 | 78.77b | 76.98b | 69.47b | 68.85b | 60.93b | 61.21b |
| F-test | * | * | ** | * | * | * |
| husk rice rates (R) | | | | | | |
| 0 Ton /ha | 79.51b | 79.10ab | 70.87 | 69.83 | 61.22b | 61.48b |
| 5 Ton /ha | 80.03ab | 79.05ab | 69.90 | 70.05 | 62.18a | 61.65ab |
| 7 Ton /ha | 80.20ab | 78.58ab | 70.01 | 69.82 | 61.98ab | 62.07ab |
| 9 Ton /ha | 81.58a | 80.42a | 69.97 | 69.82 | 62.82a | 63.0 a |
| F-test | * | * | Ns | Ns | ** | ** |
| Interaction VXR | Ns | Ns | Ns | Ns | Ns | Ns |

***, ** and Significant and highly significant at P < 0.05, P< 0.01,respectively.-NS: Not significant. -Means followed by a common letter are not significantly different at the 5% level by DMR test.**

From another point of view, Table 6 showed that increasing husk rice rates significantly increased head rice %. The highest mean values of hulling% and head rice % were found at 9 ton /ha .There was no significant

between rice husk rates 7 and 9 ton /ha on milling characters in 2012 and 2013. However the lowest head rice % resulted when husk rice rates were 0 ton /ha. Meanwhile, no significant differences between rice husk rates on milled rice % in both seasons. Obviously, Table 6 revealed that the interaction between rice cultivars and rice husk rates was no significant effect on all milling recovery characters in both seasons.

**b- Cooking and eating quality characters:**

Table 7 presents the mean values of cooking and eating quality characters of the two tested cultivars revealed that there was no significant differences were recorded in the two seasons. This could be a result of the target of the rice breeders in Egypt aim to select these types of grain that possess same characters which are cover the requirements of the Egyptian consumer.

Furthermore, from Table 7 data revealed that there were no any significant differences between the mean values of all studied characters as affected by different rice husk rates in the two season of study. Meantime, data presented in Table 7 illustrated that interactions between the two factors under study had no significant effect on cooking and eating characters in the two seasons.

**Table 7: Effect of rice cultivars and husk rice rates as well as their interaction on eating and cooking characters during 2012 and 2013 seasons.**

| Characters / Treatments | Gelatinization temperature | | Amylose content % | | Elongation % | |
|---|---|---|---|---|---|---|
| | 2012 | 2013 | 2012 | 2013 | 2012 | 2013 |
| Rice cultivars (V) | | | . | | | |
| Skha 106 | 4.75 | 4.75 | 19.14 | 18.54 | 48.76 | 48.49 |
| E.hybrid rice 1 | 5.00 | 5.08 | 19.07 | 19.91 | 46.45 | 46.84 |
| F-test | Ns | Ns | Ns | Ns | Ns | Ns |
| Husk rice rates (R) | | | | | | |
| 0 Ton /ha | 5.33 | 4.33 | 18.11 | 19.39 | 49.31 | 46.98 |
| 5 Ton /ha | 5.16 | 5.67 | 18.46 | 18.56 | 43.30 | 46.0 |
| 7 Ton /ha | 4.83 | 5.00 | 19.16 | 19.93 | 49.58 | 47.5 |
| 9 Ton /ha | 4.17 | 4.67 | 29.71 | 19.01 | 48.24 | 46.17 |
| F-test | Ns | Ns | Ns | Ns | Ns | Ns |
| Interaction | | | | | | |
| VXR | Ns | Ns | Ns | Ns | Ns | Ns |

***,** and Significant and highly significant at P < 0.05, P< 0.01,respectively.-NS: Not significant. -Means followed by a common letter are not significantly different at the 5% level by DMR test.**

## CONCLUSION

Finally, it could be concluded that there were significant differences between the mean values of the two rice cultivars under study. E. Hybrid rice 1was superior in grain yield than Sakha 106. While Sakha 106 was better than E. Hybridrice 1 in grain quality characters. Furtherore the application of rice husk had a positive effect on agronomic, yield, yield components and grain quality characters. In spite of application 9 ton/ha resulted the highest mean values of all studied characters, no significant differences were found among the two levels 7 ton /ha and 9 ton /ha of rice husk. According the

results of this study suggest that rice husk could be applied as organic fertilization (7 ton /ha) with 50% of recommended dose of nitrogen in order to environmentally -friendly rice production

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## تأثير سرسة الأرز كسماد عضوي علي صنفين من الأرز المصري

**نسرين نظمي بسيوني**

**قسم بحوث الأرز بسخا- كفر الشيخ معهد المحاصيل الحقليه -مركز البحوث الزراعية**

أقيمت تجربتان حقليتان بمزرعة مركز البحوث والتدريب في الأرز بسخا -كفر الشيخ–معهد البحوث الحقليه خلال موسمي الزراعة ٢٠١٢ و٢٠١٣ بهدف دراسة تأثير إضافه معدلات مختلفة من سرسة الأرز المطحونه كسماد عضوي مع نصف معدل النتروجين الموصي به (٧٢ كيلو جرام للهكتار نيتروجين علي صورره يوريا ٤٦%) علي بعض صفات النمو والمحصول ومكوناته وصفات جودة الحبوب في صنفين من الأرز وقد إشتملت التجربة علي ٨ معاملات عبارة عن التواليف بين ٤ معدلات مختلفة من سرسة الأرز (٠ ،٥ ، ٧ ، ٩ طن للهكتار)و صنفين من الأرز وهما (الهجين المصرى١و سخا ١٠٦ ).ونفذت التجارب في تصميم الشرائح المتعامدة في ثلاثة مكررات حيث وزعت الأصناف في القطع الأفقية بينماوزعت المعدلات المختلفة من سرسة الأرز في القطع الرآسية العمودية

**أشارت النتائج الي ما يلي:**

كان تأثير متوسطات القيم لكل الصفات المدروسه فيما عدا صفات الطهي والأكل تأثير معنوي للصنفين تحت الدراسه، وأكدت النتائج علي وجودإستجابه مختلفه لمعدلات إضافه السرسه لكل الصفات المدروسه،حيث إزدادت قيم متوسطات معظم الصفات لزياده معدلات إضافه السرسه ،وسجلت أعلي القيم عند إضافه ٩ طن للهكتار .و لا يوجد فرق معنوي في معظم الصفات بين معدل إضافه السرسه (٧ طن للهكتار) و معدل إضافه السرسه ٩( طن للهكتار)،وهذا ولم تتأثر فتره التزهيروصفات الطهي والأكل بزياده معدلات إضافه السرسه في كلا الموسمين . وكان التفاعل بين الصنفين ومعدلات إضافه السرسه تحت الدراسه معنوي في كلا الموسمين او في أحداهما بينما كان هذا التفاعل غير معنوي في كل صفات الجوده في كلا الموسمين تحت الدراسه.

توصي هذه الدراسه بإستخدام( ٧ طن للهكتار) من سرسه الأرز المطحونه كسماد عضوي مع نصف معدل النتروجين الموصي به (٧٢ كيلو جرام نيتروجين للهكتار )للحصول علي أفضل إنتاجيه من الأرزمع تقليل إستخدام االسماد النتروجيني(السماد المعدني) والحد من تلوث البيئه.