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# Effect of compost and gypsum on rice crop production in saline soil

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## Abstract

The rice crop is the most important and widely used crop worldwide, 40% of the population is dependent on rice for getting calories. This study was designed by keeping in view the importance of reclamation of saline soil and for checking the effect of compost on saline soil along with gypsum. The impact of saline soil on rice crop along with gypsum and addition of compost was checked. The trials were planned at Jhang district of Punjab. The covered area of one acre for each trial. The control treatment was only containing 60 bags of gypsum provided to rice crop in one acre area. The experimental treatments included the different amounts of compost and gypsum and their mixture was applied. It was concluded from this study that best yield was given by the trial having equal amount of gypsum and compost. The saline conditions effect the crop at initial stage, but with the combination of gypsum and compost the good yield can be obtained.

**Keywords:** Rice Crop, Gypsum, Compost, Saline Soil.

## 1. Introduction

The accumulations of salts in soil are the main threats to the agriculture. The salts that are added in to the pure soil by irrigation must be eliminated. Plants cannot uptake sufficient amount of water under extreme saline conditions. It effects the growth of the plant because the less water in plants lead to fewer metabolisms. Salts can enter in to the soil at the top most layers by capillary rise. This can be happened in saline and shallow water condition even when leaching occurs. The addition of salts can be a result of the high evaporation of salts in the summer duration. The reprocessing increases the salt concentration in soil to unbearable if done in vertical manner [1].

Rice crop is the main crop and it is grow in the rainy season, it requires excess of water 40% of population fed on rice. Rice crop is not tolerant to extreme salt conditions. During the starting period of reclamation, this crop is preferred over many other tolerant crops in saline conditions. The low land system of rice cultivation is very beneficial for this crop rather than providing salt condition, this is the reason of withstanding of rice crop to salt conditions. The salinity in soil is reduced after two or three rain falls. This reduces salinity from soil at 1 to 2 centimetres and provides good soil to the seedlings for growth. The high salt conditions create greater problems during dry seasons because the demand for evaporation is high and the water is not present in sufficient amount to be evaporated. In result the ground water from saline soil is utilized by crop. It results in low crop yield [2].

The reclamation required the proper drainage of salts through suitable drainage system. The good quality of water in arid regions is also a major issue. Tolerance ability of the plant to high saline conditions is not fixed, its variable in different species, variety of the crops. It also depends on the stages of growth. Many crops bear high salinity during germination of seeds [3].

Compost can be used to condition the soil. It can also be used as a bio fertilizer for many crops. The high salt conditions can be tolerated by using adequate amount of compost [4].

## 2. Material and methods

The rice crop nursery was developed in Jhang, Punjab Pakistan. The one marla are area was used in development of nursey. The four trial were planned in field. The seeds of rice were spread in the field area of one Marla. The germinated seeds were allowed to grow up to 4 to 6 inch plant in nursery for 1 month. These healthy and vigorous seedlings were transplanted in field after collection from nursery.

By the use of tractors levelling and dressing of the field of one Acre area was done. During the preparation of land, after levelling and dressing, the soil was covered with compost and gypsum mixture. The 90 bags of Compost and 150 bags of gypsum were used. In control only 60 bags of Gypsum were utilized. The proper irrigation was provided to the seedling at appropriate distance, and ploughing was done. The seedlings were transplanted in the field of one Acre. The Mutual practices of hoeing, tilling and irrigation were performed when required. The rice crops were harvested after 4 months.

**Table 1: Composition of compost and gypsum in trials**

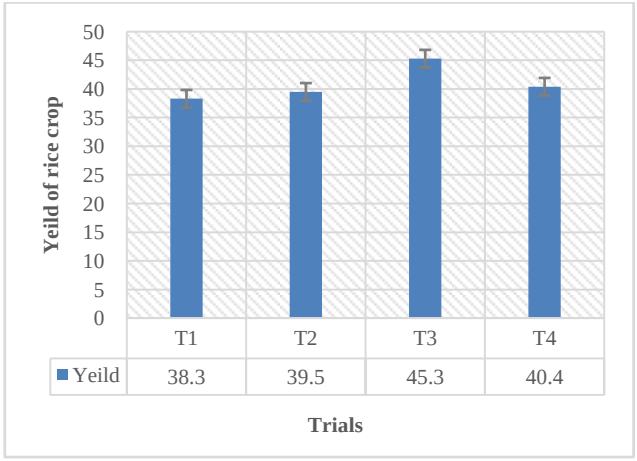
| Trials | Compost bags | Gypsum bags |
|---|---|---|
| **T1** | 0 | 60 |
| **T2** | 15 | 45 |
| **T3** | 30 | 30 |
| **T4** | 45 | 15 |

## 3. Results and discussion

The best results in terms of rice crop yield were given by the trial 3, which had equal amount of compost and gypsum. The harvested yield of this trial was 45.3 per acre. The lowest yield 38.3 was given by the control treatment, which had only gypsum. Trial 2 and 4 also showed good yield, 39.5 and 40.4. The rice crop can tolerate maximum salinity at germination stage.

**Table 2: Estimated yield of rice crop**

| Trials | Compost bags | Gypsum bags | Yield (Mound/acre) |
|---|---|---|---|
| **T1** | 0 | 60 | 38.3 |
| **T2** | 15 | 45 | 39.5 |
| **T3** | 30 | 30 | 45.3 |
| **T4** | 45 | 15 | 40.4 |




This crop is sensitive to high salts concentration at the initial stages of growth. Climatic factors also effect the salinity of soil and the crop as well. These factors include radiation, temperature, humidity and the most important rainfall [5]. The rice crop is growing under high water conditions. It eliminates the salts to several centimetres and provides better growth [2]. The very high saline conditions decrease the growth of crops by increasing osmotic pressure. The saline soil is physically not affected but it's harmful because the water is eliminated from soil at high salt concentration. The access saline soil used for the production of can be reclamated by leaching and flushing [6]. It was concluded from this study that the rice crop can grow better in saline conditions, especially when equal amount of compost and gypsum should be given.

## References

[1]. Qureshi, A. S., & Al-Falahi, A. A. Modeling the effects of different irrigation schedules and drain depths for soil salinity management: A case study from Southern Iraq. *African Journal of Agricultural Research*, 2015; 10(32): 3178-3188.

[2]. Gupta, R. K., & Abrol, I. P. Salt-affected soils: their reclamation and management for crop production. In *Advances in Soil Science* 1990; 223-288.

[3]. Abrol, I. P., Yadav, J. S. P., & Massoud, F. I. *Salt-affected soils and their management* (No. 39). *Food & Agriculture Org* 1988.

[4]. De Datta, S. K. *Principles and practices of rice production*. *Int. Rice Res. Inst* 1981.

[5]. Carrow, R. N., & Duncan, R. R. *Salt-affected turfgrass sites: Assessment and management*. John Wiley & Sons1998.

[6]. Siyal, A. A., Siyal, A. G., & Abro, Z. A. Salt affected soils their identification and reclamation. *Pak. J. Appl. Sci* 2002; 2(5): 537-540.