

Effect of Saline Irrigation Water on Grain Yield and Quality of Some Rice Varieties and Lines

S.H. Abou-Khadra, E. El. M. El-Sheref, A. E. Dras* and Raghda M. Sakran*

Agron. Dept., Fac. Agric., Kafrelsheikh Univ., Kafrelsheikh and

*Rice Research & Training Centre, Field Crops Res. Institute,

Agriculture Research Centre, Cairo, Egypt.

TWO LYSIMETER experiments were carried out in the Rice Research and Training Center (RRTC), Sakha, Kafrelsheikh, Egypt, during 2004 and 2005 seasons under controlled conditions to determine the effect of irrigation with different levels of saline water on yield and grain quality of some local and introduced rice varieties and lines (four varieties and seven lines). The salinity levels were adjusted to 2000 ppm, 4000 ppm and 6000 ppm. In addition, the control was kept to be irrigated by tap water. The water was artificially salinized by applying sodium chloride (NaCl) and calcium chloride (CaCl₂) at the ratio of 2: 1, respectively. A split plot design with three replications was used in conjunction with salinity levels on the main plots and varieties and lines in sub plots.

The obtained results could be summarized as follows:

*The highest mean value of yield and its components were produced at tap water treatment (control) whereas the lowest one of them were produced by 6000 ppm salinity level.

*The results also showed that Giza 178, Sakha 104, line AC-YT-2003-10 and line AC-AT-2003-33 had the highest values of grain yield and yield components.

*Increasing salinity level up to 6000 ppm markedly increased gelatinization temperature, while the highest values of hulling and milling percentage were produced at tap water treatment.

*Giza 177, line AC-YT-2003-41, line GZ1368-5-5-4 and line AC-YT-2003-6, gave the highest values of grain quality.

*The varieties and lines GZ1368-S-5-4, Giza 178, Sakha 104, AC-YT-23003-41 and AC-YT-2003-15 had the highest salinity index values for grain yield under 2000, 4000 and 6000 ppm salinity levels. These varieties and lines which had the highest value of salinity index had low reduction % for grain yield in both seasons.

Keywords: Rice (*Oryza sativa* L.), Varieties, Salinity, Yield, Quality.

Rice (*Oryza sativa*) is one of the world's most important cereal crops, providing staple food for nearly one half of the world population. In many developing countries, rice is the main source of food security and is intimately associated with local life styles and culture. Rice crop plays a significant role in Egypt's