

## Effect of Irrigation with Shallow Ground Water Salinity and Nitrogen Fertilization on Four Wheat Genotypes

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### Abstract:

This study was conducted on three different locations in El-Kharga Oasis, New Valley Governorate, Egypt, using four genotypes of wheat (Okas, 6, 14 and Sakha 93) during two successful growth winter seasons of 2012/13 and 2013/14. The soils of the locations were irrigated with shallow groundwater of different salinity (2.0, 5.2 and 10.7 dS.m<sup>-1</sup>) for Loc1, Loc2 and Loc3 respectively. Nitrogen fertilizer was applied at rates of 288 Kg N/Ha and 360 Kg N/Ha of the recommended N doses (288 Kg/Ha).

The obtained results indicated that increasing water salinity from 2 to 5.2 and 10.7 dS.m<sup>-1</sup> decreased significantly ( $P < 0.05$ ) the grain and straw yields of wheat by 6.1 and 4.9% for loc2 and by 47.4 and 22.4% for Loc3 compared with loc1 respectively. The results also show that genotype-6 was more salinity tolerant than variety Sakha 93, Okas and 14 genotypes. The application of 360 Kg N/Ha fertilizer was significant enhanced the grain and straw yields of wheat genotypes.

The data also, show that fertilization of genotype-6 with 360 Kg N/Ha to result in greatest grain yield of wheat under saline conditions.

**Keywords:** wheat (*Triticum aestivum* L.), Sakha 93, salt tolerance, chemical composition, adaptation, saline groundwater

### Introduction

Wheat (*Triticum aestivum* L.) is the most important cereal crop in Egypt where its production increased from 2.08 million tons in 1982/ 1983 to 6.42 million tons in 2001/2002 season marking, 209% increase (Statistical Data, 2002, ARC, Giza). This increase was achieved by both increasing wheat area from 554,400 to 1,029,000 hectares and continuous rise in grain yield ha<sup>-1</sup> from 3.595 to 6.238 ton ha<sup>-1</sup> as a result of cultivating high yield genotypes and improved cultural practices. Efforts to produce enough food will push to farming new land less favorable for

growing wheat than the old alluvial soil. Most of new lands in Egypt are subjected to drought and salinity. The rainfall and/or the existing fresh water in such regions are limited. Since, irrigation depends mostly on underground water. Drought and salinity problems are very important although these are generally confined to arid and semi arid regions. Consequently, growth and productivity of most crops were progressively reduced (Marchner *et al.*, 1981). The major inhibitory effect of drought and salinity on plant growth has been attributed to osmotic inhibition of water availability and toxic effect of salt