

## ABSTRACT

Two field experiments were carried out at Tag El-Eiz Agriculture Research Station, Dakahlia Governorate in 2001/ 2002 and 2002/ 2003 seasons to study the effect of three soil salinity levels i.e.  $S_1$  (1-2 mmhos/ cm, control),  $S_2$  (5-5.5 mmhos/ cm) and  $S_3$  (8-9 mmhos/ cm) on productivity, physiological and biochemical characters, and find out a reliable morphological and biochemical characters for identifying various genotypes of ten wheat varieties (*Triticum aestivum* L.) i.e. Sakha 61, Sakha 93, Sakha 8, Giza 164, Giza 168, Giza 170, Gemmeiza 5, Gemmeiza 7, Gemmeiza 9 and Sids 1. The obtained results could be summarized as follows:

Results indicated that average values of plant height, number of leaves/ plant, leaf area index, number of tillers/ plant, number of days to 50% heading, relative growth rate, net assimilation rate, crop growth rate, spike length, number of spikes/  $m^2$ , number of grains/ spike, grains weight/ spike, 1000 grain weight, grain yield/ feddan and straw yield/ feddan as well as the percentages of seed carbohydrate, phosphorus and potassium in grains were significantly decreased with increasing soil salinity level in both seasons. For example the highest soil salinity level ( $S_3$ ) caused (36.92% and 39.98%) reduction in grain yield as compared with the lowest soil salinity level ( $S_1$ ) in 2001/ 2002 and 2002/ 2003 seasons, respectively.

The obtained results showed that most qualitative characters changed under increasing soil salinity levels except coleptile anthocyanin coloration, anthocyanin coleptile of auricles, extent of internal hair of lower glum and grain color

character were absent, weak and white of all wheat varieties under three soil salinity levels.

Concerning, average of chlorophyll stability index, proline content in leaves, grain protein percentage, grain sodium percentage, number of distinguish bands and number of total bands increased with increasing soil salinity level in both seasons. For example the highest soil salinity level ( $S_3$ ) caused (36.63 and 40.56%) increase in sodium percentage as compared with the lowest soil salinity level ( $S_1$ ) in 2001/ 2002 and 2002/ 2003 seasons, respectively.

Results indicated that wheat varieties significantly differed in all the studied characters in both seasons. Wheat variety Sakha 93 gave the highest values of number of tillers/ plant, number of tillers/ leaves leaf area index, chlorophyll stability index, relative growth rate, net assimilation rate, crop growth rate, number of spikes/  $m^2$ , number of grains/ spike, grains weight/ spike, grain yield/ feddan, proline content in plant leaves, protein and potassium percentage.

Wheat variety Gemmeiza 5 gave the highest values of seed carbohydrate percentage and sodium percentage. Wheat variety Gemmeiza 9 gave the highest values of 1000-grain weight.

Wheat variety Sakha 8 gave the highest values of straw yield ton/ feddan, phosphorus percentage and number of total bands, on the contrary the highest values of plant height and number of days to 50% heading were recorded by wheat variety Sids 1.

The interaction effect among soil salinity levels and wheat varieties on all the studied characters was significant in both seasons except number of tillers/ plant, number of leaves/

plant were insignificant in both seasons. From these results it could be concluded that Sakha 93 was the most salt tolerant variety. At S<sub>3</sub> soil salinity level, variety Sakha 93 gave the highest grain yield/ feddan (14.02 and 15.80 ardab) in 2001/ 2002 and 2002/ 2003 seasons, respectively.

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