Abstract

Salinity is one of the most brutal environmental factors limiting the productivity of crop plants because most of the crop plants are sensitive to salinity caused by high concentrations of salts in the soil, and the area of land affected by its increasing day by day. Also, there is numerous environmental problems being caused by chemical fertilizer overuse, agricultural practices are shifting toward the development of environmentally friendly N fertilizers.

The objective of this study was to investigate the ability of biogen and cyanobacteria as biofertilizers and arginine and glutamic acid as amino acids for substitution the normally used chemical fertilizer (urea) and to ameliorate the harmful effect induced by salinity on two wheat cultivars Sakha 93 (salt tolerant) and Gemiza 10 (salt sensitive).

Two pot experiments were carried out to study the effect of application of two biofertilizers (cyanobacteria and biogen) or two amino acids (glutamic acids and arginine) on wheat salt tolerant (Sakha93) and wheat salt sensitive (Gemiza10) grown under saline condition.

Experiment I: The impact of biofertilizer on salinized wheat growth and yield is shown by analyzing the obtained data. Results indicate a significant reduction in catalase, peroxidase activity and lipid peroxidation in leaves in presence of biogen or cyanobacteria. Application of biogen (250g/fed.) plus 200mM NaCl in the soil results in significant increase in plant growth and grain yield, concomitantly with an increase in photosynthetic pigments, total carbohydrates and protein content. Moreover, Biogen reduced Na^+ content and increased N, P and K in the wheat shoots. In addition, the most yield qualities (Carbohydrates, protein content, wet, dry gluten and ash content, N, P and k content in grains) were improved in response to treatment with Biogen (250g/fed.) in presence of 200mM NaCl salinized soil. Furthermore, Scanning of protein profile of grains showed appearance and disappearance of some protein bands in response to the different biofertilizer treatments.

Experiment II: The impact of amino acids treatment on salinized wheat growth and yield is shown by analyzing the data of the pot experiment results. Results indicate reduction in catalase, peroxidase activity and lipid peroxidation in leaves with application of amino acid (glutamic or arginine). Application of arginine (presoaking in 2mM for 6h) in presence of 200mM NaCl in the soil results in significant increase in plant growth and grain yield, concomitantly with an increase in photosynthetic pigment, total carbohydrates and protein content. Moreover, arginine (presoaking in 2mM for 6h) reduced Na^+ content and increased N, P and K in the wheat shoots. Also the most yield qualities (Carbohydrates, protein content, wet, dry gluten and ash content, N, P and K content in grains) were obtained with arginine (presoaking in 2mM for 6h) in presence of 200mM NaCl in the soil.

In addition, Scanning of protein profile of grains showed appearance and disappearance of some protein bands in response to the different amino acid fertilization treatments.

In conclusion, According to our results we recommend the using of biogen as biofertilizer rather than cyanobacterial biofertilizer, on the other hand, using the presoaking in arginine as amino acid rather than glutamic acid for partial substitution of urea (50%) for salty land (in the range of 100-200mM NaCl) cultivated with wheat Sakha 93 as (salt tolerant) and Gemiza 10 as (salt sensitive).

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