EFFECT OF SOME BIOTIC AND ABIOTIC TREATMENTS ON IMPROVING SALT TOLERANCE IN WHEAT PLANTS

By

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M.Sc. Agric. Sc. (Plant Physiology), Ain Shams University, 2007

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تأثير بعض المعاملات الحيوية وغير الحيوية على زيادة تحمل الملوحة فى نباتات القمح

رسالة مقدمة من

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للحصول على

درجة دكتور فلسفة فى العلوم الزراعية

(فسيولوجيا النبات)

قسم النبات الزراعى

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صفحة الموافقة على الرسالة

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Deep thanks are offered to **Dr. Sayed Said Shaban Eisa** Associate Professor of Plant Physiology, Dept. of Agric. Botany, Fac. of Agric., Ain Shams Univ. for his supervision and kind remarks following up the stages of laboratory work and efforts in writing.

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Many thanks are offered to the **Engineer**/ Mohamed Mohamed Amer and his son Abdel Wahab Mohamed Mohamed Amer.

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ABSTRACT

Bahaa Badry Mosa Salm: Effect of some Biotic and Abiotic Treatments on Improving Salt Tolerance in Wheat Plants. Unpublished Ph.D. Thesis, Department of Agricultural Botany, Faculty of Agriculture, Ain Shams University, 2011.

Two field experiments were conducted during 2009/2010 and 2010/2011 winter seasons, to study the effect of salt affected soil and water in addition to biofertilizers, micronutrients and potassium silicate on two wheat (*Triticum aestivum* L.) cultivars cv. Sakha 93 "Salt tolerance" and cv. Giza 168 "salt sensitive". Three samples were taken after 90, 105, 150 days from sowing for growth parameters, yield components and some biochemical constituents.

The highest rate of potassium silicate and cv. Sakha 93 were more effective than the rest of treatments and cv. Giza 168 in plant height, leaves number per plant, tillers number per plant, tillering index, spikes number per plant, main spike weight, grains number per main spike and weight of 100 grains. Mycorrhiza treatment has strongly stimulating effect on plant height, flag leaf area and shoots fresh and dry weights. Mix of bacteria and potassium silicate mitigated the adverse effect of salinity. In general, a significant increase in biochemical components (phenols, proline, total soluble carbohydrates, total sugars and proteins) and mineral nutrients (N, P, K, Ca, Mg, Zn, Mn and Fe) as well as K:Na, Ca:Na and Mg:Na ratios could be considered as indicator for salt tolerant by plant.

As was expectant cv. Sakha 93 has shown high response to treatment as compared to cv. Giza 168 These results were associated with growth parameters, yield and chemical constituents.

Key words: Wheat, *Triticum aestivum* L., Biotic treatments, Abiotic treatments, Bacteria, *Bacillus*, Mycorrhiza, Micronutrients, Potassium silicate, salinity, salt stress.

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