EFFECT OF SALINE WATER ON THE CHEMICAL COMPOSITION OF WHEAT PLANT GROWN UNDER DESERT SOIL CONDITIONS

By

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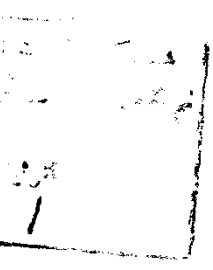

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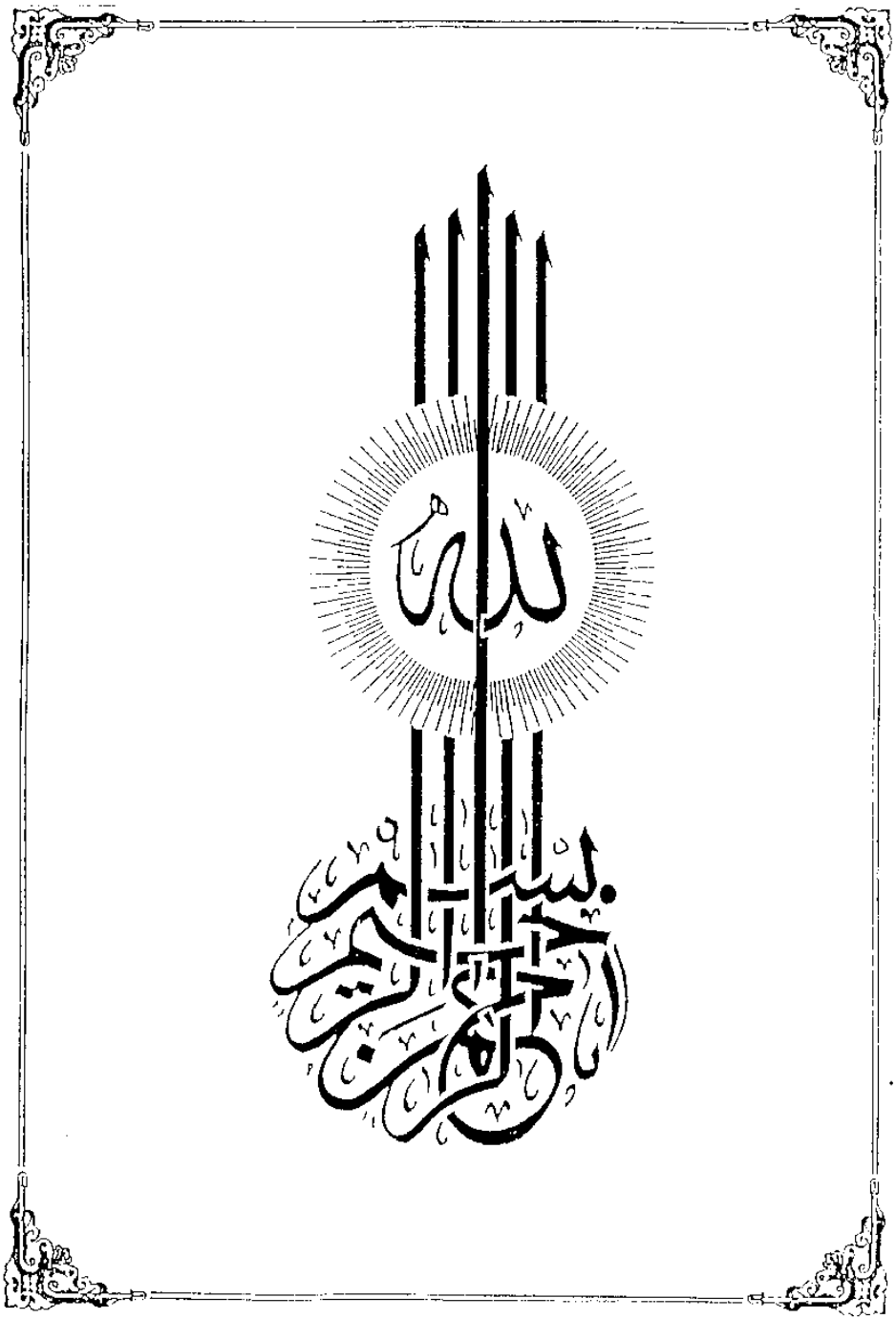

APPROVAL SHEET

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ABSTRACT

Mohamed Hussein Aly Ahmed. Effect of saline water on the chemical composition of wheat plant grown under desert soil conditions. Unpublished Ph.D. Thesis, University of Ain Shams, Faculty of Agric., Department of Biochemistry, 1997.

Pot and field experiments were conducted to evaluate the effect of saline water and soil conditioners application on chemical, biochemical components and yield of wheat. The pot experiment results showed that germination percentage and plant height of wheat were significantly decreased with increasing salinity levels from 247 to 7500 mg/L. The total chlorophyll, chl.a, chl.b, and protein contents decreased but carotene content, total carbohydrate, soluble, reducing and non reducing sugars of wheat leaves and shoots increased with increasing salinity levels in irrigation water. Proline content and peroxidase enzyme activity of wheat leaves increased while poly phenol oxidase activity decreased with increasing salinity. Also, the content of P, K, Mn, Zn and Fe of wheat shoots were decreased with increasing salinity levels.

Two field experiments were conducted during season 93/94 and 94/95. The results indicated that the contents of protein, P, K, Mn, Zn and Fe of wheat shoots after 45 and 90 days from sown significantly decreased with increasing salinity levels. P and K contents of wheat grains insignificantly decreased as well. Peroxidase enzyme activity of wheat leaves increased and poly phenol oxidase activity decreased with increasing salinity levels. Concerning the values of proline, total carbohydrate and soluble sugars of wheat shoots, similar trend as that found in pot experiment was obtained. In wheat grains, proline content was decreased while total carbohydrates and soluble sugars content were increased with increasing salinity levels. Grains and straw yields of wheat were significantly decreased with increasing salinity levels in irrigation water. In both seasons, the application of soil conditioners decreased proline content and poly phenol oxidase activity in wheat leaves. The proline of wheat grains was increased. Proteins, total carbohydrates, soluble sugars, P, K, Mn, Zn, and Fe contents in shoots and grains were increased .

Grains and straw yields of wheat were significantly increased with application of soil conditioners especially TR_2 treatment. The interaction effect showed that the values of protein, peroxidase activity, total carbohydrate, soluble sugars and nutrients content of wheat shoots and grains increased but poly phenol oxidase activity and proline decreased with application of soil conditioners at any salinity levels. The above results were reflected on grains and straw yield of wheat, where, the values were increased with the application of soil conditioners at any salinity level in irrigation water. $30m^3$/fed. of town refuse was the best at any level of salinity in both seasons.

Concerning soil chemical properties the values of soil salinity, total nitrogen, available phosphorus and soluble soil potassium increased either with increasing salinity levels or soil conditioners application for both growing seasons. Soil organic matter percentage decreased with increasing salinity levels, but the values increased with the application of both soil conditioner types. In conclusion, the beneficial effect of soil conditioners was observed at any level of salinity in irrigation water.

Key words; saline water, soil conditioners, wheat plant, grains, protein, proline, peroxidase activity, poly phenol oxidase, total carbohydrates, soluble sugars, P, K, Mn, Zn, Fe and soil chemical properties.

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