



CHEMICAL TREATMENT OF NILE ROSE FOR ITS CONVERSION TO FERTILIZERS FOR CORN CROP GROWN ON SANDY SOILS

By

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ABSTRACT

The present investigation aims to study the chemical treatment of water hyacinth (Nile rose) to produce different organic fertilizers. The effect of the prepared organic fertilizers on the growth, quality and chemical composition of corn crops and their effects on some soil properties at harvest were evaluated in field experiment at Ismailia Research Station, Ismailia Governorate, Egypt. Organic fertilizers were prepared by acid hydrolysis of water hyacinth to obtain water hyacinth leaf fertilizers (WHLF). A germination experiment was done on a laboratory scale to determine the best treatments for application in field experiment. The best treatments were: 0.04% WHLF + NPK; 0.06% WHLF + NPK; 0.08% WHLF + NPK; 0.02% WHLF +NK; 0.04% WHLF +NK; 0.06% WHLF +NK; 0.06% WHLF +NPK+M and 0.06% WHLF +NPK+M. The field experiment was duplicated in two seasons of 2013 and 2014. The effects of the different fertilizers on growth quality parameters of corn (*Zea mays*) and also their effects on some soil properties were determined. The data showed that all fertilizer treatments exceeded that of unfertilized control in plant height (cm). The statistical analysis revealed that the treatment type, cultivation duration and their interaction had significant effect on corn height. The number of cobs during the first and second cultivation seasons did not show any significant differences for all treatments whereas the weight of the cobs (g) was significantly higher in all fertilized groups compared to the control (unfertilized treatment). The results for protein content of corn leaves and stems under different treatments exhibited that the protein content of corn leaves was significantly affected by type of fertilizer applied during the two seasons and for the combined results over the two seasons. The effect of the different fertilizers treatments on fat, ash and fiber percentage in corn seeds indicated significant increases for all treatments compared to the unfertilized control. The results also indicated that available nitrogen, phosphorus and potassium in the soil after harvesting of corn plants, were significantly increased due to application of all fertilizer treatments. The data for the two seasons revealed that the pH of the soil was not significantly affected by the application of different fertilizers. The values of cation exchange capacity were significantly increased with applying the different organic fertilizers as compared to control. In addition, organic fertilizer treatments significantly increased organic matter. In conclusion, the data of the present study demonstrated that water hyacinth instead of being a noxious plant it could be turned onto valuable organic fertilizer. The organic fertilizers produced from water hyacinth leaves enhanced the growth parameters of corn cultivated in sandy soil. Water hyacinth organic fertilizers showed also positive effects on some soil properties.

Key words: Nile rose; water hyacinth; organic fertilizer; *Zea mays*; soil; macronutrients; germination

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