

IMPROVEMENT OF PHOSPHATE FERTILIZERS EFFICIENCY USE FOR CERTAIN SOILS OF EGYPT

By

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B.Sc.Agric.Sc. (Soil science), Ain Shamus Univ. (2002)

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ABSTRACT

Mahmoud Ibrahim Nosair: Improvement of Phosphate Fertilizers Efficiency Use for Certain Soils of Egypt. Unpublished Ph.D. Thesis, Department of Soil Science. Faculty of Agriculture, Ain Shams University, 2017

Phosphorus is one of 17 nutrients essential for plant growth. Its functions cannot be performed by any other nutrient, and an adequate supply of P is required for optimum growth and reproduction. The present investigation was carried out to study the effect of application of different granular single super phosphate (GSSP) fertilizers treatments on availability of phosphorus in different soils. To fulfill the aims of this study, Firstly, an incubation experiment was done to study the effect of some organic materials (vinasse and humic acid) in combination with super-phosphate on the availability of phosphorus in both clay and sandy soils. The best treatments were GSSP coated with vinasse (100%) and GSSP coated with humic acid (20%) for both clay and sandy soils. Secondly, two field experiments in clay and sandy soils were carried out to study the effect of these different treatments of super phosphate fertilizers (the best treatments of incubation experiment) on phosphorus uptake by wheat plants. The results showed that the best treatments for clay soil GSSP coated with vinasse at 300 kg/fed for dry matter yield and GSSP coated with vinasse at 100, 200 kg/fed for nutrient content of wheat plant at tillering growth stage. The best treatment was GSSP at a rate of 300 kg/fed for both dry matter and weight of spikes while addition of GSSP at a rate of 100kg/fed for nutrient content of wheat plant at flowering growth stage. Application GSSP coated with vinasse at a rate of 200 kg/fed led to significantly increase straw and grain yields as well as nutrient uptake by wheat plants. While biological yield was significantly increased as a result of added GSSP coated with humic acid at a rate of 300 kg/fed. The best treatments for phosphorus use efficiency (PUE) were GSSP coated with vinasse at applied a rate of 200 kg/fed for straw yield

and GSSP coated with humic acid at added a rate of 100 kg/fed for grain yield. Results also revealed that the best treatments for sandy soil were GSSP at applied a rate of 300 kg/fed for dry matter and GSSP coated with vinasse at applied a rate of 200 and 300 kg/fed for nutrient content at tillering growth stage. Whereas, application of GSSP coated with both of humic acid and vinasse at the rate of 200 kg/fed were favorited for dry matter and weight of spikes, respectively, while addition GSSP at the rate of 200 kg/fed was the best one for nutrient content at flowering growth stage. The best treatments for straw and grain yields, as well as nutrient uptake were GSSP coated with vinasse at the rate of 200 kg/fed while application of GSSP coated with vinasse at the rate of 300 kg/fed was the best one for biological yield. In addition, the best treatment for PUE was GSSP coated with humic acid at the rate of 100 kg/fed for straw and grain yields.

Key words: Wheat, Supper phosphate, Vinasse, Humic acid.

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