IMPROVEMENT OF PHOSPHATE FERTILIZERS EFFICIENCY USE FOR CERTAIN SOILS OF EGYPT

By

MAHMOUD IBRAHIM ABD EL FATAH NOSAIR

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

M.Sc.Agric.Sc. (Soil science), Ain Shamus Univ. (2010)

A Thesis Submitted in Partial Fulfillment

Of

The Requirement for the Degree of

DOCTOR OF PHILOSOPHY
in
Agricultural Sciences
(Soil Science)

Department of Soil Science

Faculty of Agriculture

Ain Shams University

2017

Approval sheet

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This thesis for P.hD. degree has been approved by:

Dr. Ahmed Mohamed Helmy Khater **…….……**

Researcher Prof. Emeritus of Soil Science, National Research Center.

Dr. Ahmed Abdelfattah Ahmed Ibrahim **…….**

Prof. Emeritus of Soil Science, Faculty of Agriculture, Ain Shams University.

Dr. Mohamed Ahmed Mahmoud Mostafa **…….……**

Prof. Emeritus of Soil Science, Faculty of Agriculture, Ain Shams University.

Dr. Abdel-Samad Salem Ismail Hegazy **…….**

Prof. Emeritus of Soil Science, Faculty of Agriculture, Ain Shams University.

Date of examination: / 2017

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Under supervision of:

Dr. Abdel-Samad Salem Ismail Hegazy

Prof. Emeritus of Soil Science, Department of Soil Science, Faculty of Agriculture, Ain Shams University (Principal Supervisor).

Dr. Mohamed Ahmed Mahmoud Mostafa

Prof. Emeritus of Soil Science, Department of Soil Science, Faculty of Agriculture, Ain Shams University.

Dr. Mohamed Abd El-Rahman Ahmed Zaid

Head of Laboratories and Research Quality Sector of Abu Zaabal Fertilizers and Chemicals Company.

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 Unpublished Ph.D. Thesis, Department of Soil Science.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 supper 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 supper 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.

ACKNOWLEDGEMENT

All thanks to ALLAH who gave me an ability to overcome all difficulties faced the accomplishing of this investigation.

The author wishes to express his great appreciation and deep gratitude all thanks to **Dr. Abdel-Samad Salem Ismail Hegazy, Professor** of Soil Science **and Dr. Mohamed Ahmed Mahmoud Mostafa, Professor** of Soil Science, Soils Department, Faculty of Agriculture, Ain Shams University, for suggesting the problem, drawing the plane of the work, active supervision, helpful guidance and continuous criticism in preparing and writing up this manuscript.

The author wishes to express his great appreciation and deep gratitude to **Dr. Mohamed Abd El-Rahman Ahmed Zaid** Head of Laboratories and Research Quality Sector of Abu Zaabal Fertilizers and Chemicals Company, for Supervision and guidance and assistance in the implementation of the Action Plan.The author wishes to express his great appreciation and deep gratitude to **Dr. Ahmed Ismail Ahmed Abd El-All Researcher** at the Institute of Soil, Water and Environment Research Center of Agricultural Research, for Supervision and guidance and assistance in the implementation of the Action Plan.

The author wishes to express his great appreciation and deep gratitude all thanks to **Dr. Sherif Elgabaley** chairman of Abu Zaabal Fertilizers and Chemicals Company and the author wishes to express his great appreciation and deep gratitude all thanks to **En. Abd Elsalem Elgabaley** Vice Chairman and Managing Director and the author wishes to express his great appreciation and deep gratitude all thanks to **Accountant Naef Fahmey** Vice Chairman and Managing Director for Great of the confidence and the opportunity to this study.

ABSTRACT

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