STUDIES ON PHOSPHORUS FERTILIZATION FOR WHEAT PLANTS

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CONTENTS

ABSTRACT	`
INTRODUCTION	1
REVIEW OF LITERATURE	3
2-*1-Rock phosphate and soluble phosphate fertilizer*	3
2-2-Phosphate solubilizing microorganisms as P biofertilizers:	5
2-3- Organic manure and P avilability.	7
2-4- Sulphur and P avilability.	9
2-5- Effect of the interaction between the studied treatments on plant growth and soil properties.	10
MATERIALS AND METHODS	15
3.1. Experimental site	15
3.2. The experiment:	15
3.3 Soil analysis	15
3.2.1 Mechanical analysis:	15
3.2.2 Chemical asnalysis	16
3.4. Wheat harvest and sampling:	19
3.5. Plant analysis	19
3.6. Measured parameter	19
RESULTS AND DISCUSSION	21
4.1. Plant growth characters**.**	21
4.2. Effect on yield component	28

4.3. Effect on grain and straw yields:	36
4.4. Effect on N, P and K content in shoots at 75 days from sowing.	52
4.5. Effect on N, P and K concentration in grains.	60
4.6. Effect on N, P and K concentration on straw.	67
4.7. Effect on N, P and K uptake	74
4.8 Effect on soil properties:	89
4.9 Soil fertility:	92
Conclusion	98
SUMMARY	100
REFERENCES	103
ARABIC SUMMARY	1

List of Tables

Table No.		Page
Table (1)	Some physical and chemical characteristics of studied soil for the two seasons	17
Table (2)	Some chemical composition of the used Farmyard Manure	18
Table (3)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on growth characters.	22
Table (4)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on yield components.	29
Table (5)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on grain, straw and biological yields.	38
Table (6)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N,P and K content in wheat plants after 75 days from sowing.	53
Table (7)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N, P and K concentration in grains.	61
Table (8)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N, P and K concentration in straw.	68

Table (9)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N, P and K uptake in grains.	75
Table (10)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N, P and K uptake in straw.	79
Table (11)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on total N, P and K uptake .	83
Table (12)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on soil pH, EC and O.M	90
Table (13)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on availability of N, P and K in soil.	95

List of Figures

Figure No.		Page
Fig. (1)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on plant height (cm).	23
Fig. (2)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on dry weight (g).	27
Fig. (3)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on number of spike/m2.	30
Fig. (4)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on number of grains/spike	33
Fig. (5)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on 1000-seed weight.	37
Fig. (6)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on grain yield (Mg ha^{-1})	39
Fig. (7)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on straw yield (Mg ha^{-1})	44
Fig. (8)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral	48

	phosphorus fertilization on biological yield ($Mg\ ha^{-1}$)	
Fig. (9)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N concentration ($g\ kg^{-1}$) in shoots.	54
Fig. (10)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on P concentration ($g\ kg^{-1}$) in shoots.	55
Fig. (11)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on K concentration ($g\ kg^{-1}$) in shoots.	56
Fig. (12)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N concentration ($g\ kg^{-1}$)in grains.	62
Fig. (13)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on P concentration ($g\ kg^{-1}$)in grains.	63
Fig. (14)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on K concentration ($g\ kg^{-1}$)in grains.	64
Fig. (15)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral	69

	phosphorus fertilization on N concentration (g kg^{-1})in straw.	
Fig. (16)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on P concentration (g kg^{-1})in straw.	70
Fig. (17)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on K concentration (g kg^{-1})in straw.	71
Fig. (18)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N –uptake (kg ha^{-1}) in grains.	76
Fig. (19)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on P –uptake (kg ha^{-1}) in grains.	77
Fig. (20)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on K –uptake (kg ha^{-1}) in grains.	78
Fig. (21)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on N –uptake (kg ha^{-1}) in straw.	80
Fig. (22)	Effect of rock phosphate along with phosphorine,	81

	organic manure and sulphur as well as mineral phosphorus fertilization on P –uptake (kg ha^{-1}) in straw.	
Fig. (23)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on K –uptake (kg ha^{-1}) in straw.	82
Fig. (24)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on total N –uptake (kg ha^{-1}) in straw.	84
Fig. (25)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on total P –uptake (kg ha^{-1}) in straw.	85
Fig. (26)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on total K –uptake (kg ha^{-1}) in straw.	86
Fig. (27)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on soil pH	91
Fig. (28)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on EC (dSm^{-1}.)	93
Fig. (29)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on organic matter (g kg^{1})	94

Fig. (30)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on soil availability N (mg kg^{-1})	96
Fig. (31)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on soil availability P (mg kg^{-1})	97
Fig. (32)	Effect of rock phosphate along with phosphorine, organic manure and sulphur as well as mineral phosphorus fertilization on soil availability K (mg kg^{-1})	99

ABSTRACT

Two field trials were conducted in two successive growing seasons (2012/2013 and 2013/2014) at the Experimental Farm of Mallawy Agricultural Research Station (ARC) , Minia Governorate , Egypt to study the effect of added 43 kg ha^{-1} rock phosphate (RP) along with phosphate dissolving bacteria inoculation (B), 24 Mg ha^{-1} farmyard manure (FYM) and 240 kg ha^{-1} sulphur (S) as well as 16 or 32 kg ha^{-1} recommended rate of phosphorus as calcium superphosphate (16 or 32 kg ha^{-1} RR) on growth , yield component , grain and / or straw yields and N,P and K concentration and uptake of wheat plants as well as soil properties and fertility .

Results showed that , plant height , dry weight , number of spikes / m^2 , number of grains / spike ,yields and NPK uptake of grains and / or straw and soil available phosphorus were positively affected by rock phosphate application .

Phosphorine inoculation (phosphate dissolving bacteria) was significantly increased plant height , dry weight , number of grains / spike , yields and NPK uptake of grains and /or straw , phosphorus concentration in grains and straw and soil available phosphorus .

Farmyard manure application was significantly improved plant height , dry weight , number of spikes / m^2 , number of grains / spike , yields and uptake of grains and / or straw , N and K concentration at 75 days age of wheat , soil pH (decreased its values), soil organic matter and soil available N , P and K after harvest , while soil salinity was increased .

Plant height, dry weight, number of grains /spike, Phosphorus concentration in wheat plant at 75 days age, phosphorus concentration in grains and straw yields and NPK uptake of grains and / or straw and soil available phosphorus after harvest were significantly responded to sulphur application, while soil pH was negatively responded to sulphur.

Abstract

Application of 16 or 32 kg ha^{-1} of the recommended phosphorus rate were significantly enhanced plant height , dry weight , number of spikes / m2 , number of grains / spike , yields and NPK uptake of grains and / or straw , phosphorus concentration in plant at 75 days age and soil available phosphorus . Increasing phosphorus rate to 32 kg ha^{-1} RR increased these parameters than 16 kg ha^{-1} RR.

Combined 43 kg ha^{-1}RP + phosphorine inoculation + 24 Mg ha^{-1} FYM + 240 kg ha^{-1} S produced highest or similar values of the above mentioned parameters as compared with 32 kg ha^{-1} RR .

Key words: wheat , rock phosphate , phosphate dissolving bacteria , farmyard manure , sulphur , super phosphate , growth , yield and yield components , nutrient status and soil properties and fertility