Evaluate the Phosphorus Mobility in Soil Applying Organomineral Fertilizer and Mineral Fertilizer Phosphate

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Introduction

Phosphorus (P) is the nutrient that most influences the early development and growth of plants. P fertilization takes the feature of applying a several times greater than that amount required by the plant, since it becomes necessary to satisfy the requirement of the soil, saturating the components responsible for fixation and adsorption of P. The rearing of pigs and poultry has a large quantity of waste, which if not properly managed, have high pollution load to the soil, air and water. However, pig slurry and poultry can be efficient and safe fertilizers in crop fertilization, since it preceded the environmental assets to ensure the protection of the environment prior to its recycling.

Objective

The objective of this study was to evaluate if the liquid fertilizer could allow the mobility of phosphorus in the soil profile.

Materials and Methods

The experiment was arranged as a randomized complete block design (RCBD) of 5 x 5 x 1 with three replications. where factor 1 referred to fertilizer type, factor 2 referred to doses of phosphorus and factor 3 the soil Psament. Each experimental unit consisted of PVC pipe 8 "containing 20 dm3 soil with four depths, each depth of 10 cm, 40 cm and a total of two corn plants. The depths were: 0-10 cm; 10-20cm; 30-40cm 20-30 cm and a total of 100 experimental units and four depths, which corresponds to 400 samples of soil.

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-Treatments: Fertilizer 1 liquid organomineral (MAP+Manure swine) 1 liquid mineral (MAP + WATER), MAP:monoammonium phosphate, 2 solid mineral: MAP, triple superphosphate - ST) and 1 solid organomineral (poutry litter+ phosphorite), and five doses of phosphorus, 0, 50, 100, 200 and 300 mg dm^{-3} of phosphorus.
- Analysis: soil samples were determination P extracted by an ion exchange resin have been conducted (RAIJ et al., 2001).

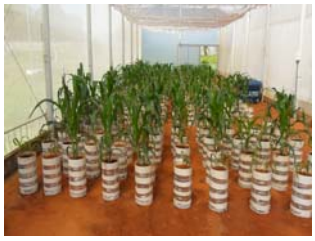
Results

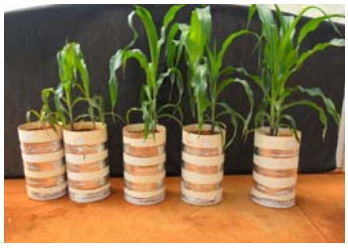
Table 1: Phosphorus concentrations (mg dm^{-3}) due to the application of mineral fertilizers and organomineral in solid and fluid forms for the corn crop in four depths.

Doses P mg dm^{-3}	0-10cm Depth				
	Fertilizantes				
	Poutry litter+ phosphorite	MAP	MAP+Manuer	MAP+H2O	ST
0	2,9	2,9	2,9	2,9	2,9
50	5,0	28,1	7,7	5,9	36,6
100	3,8 b (1)	60,6 a	20,3 b	17,5 b	62,4 a
200	4,7 b	92,9 a	20,4 b	23,9 b	65,1 a
300	13,1 c	175,0 a	28,8 c	37,3 c	122,0 b
Ef. de doses	N.S	L**(2)	N.S	L*	L**
10-20cm Depth					
0	2,2	2,1	2,1	2,2	2,2
50	6,5	5,2	3,8	2,4	3,5
100	17,1	5,0	2,8	2,5	6,8
200	11,8	12,7	2,6	2,60	7,0
300	10,2 b	28,1 a	5,7 b	5,0 b	15,3 b
Ef. de doses	N.S	L**(2)	N.S	N.S	L*
20-30cm Depth					
0	2,0	2,0	2,0	2,0	2,0
50	2,2	2,6	2,1	2,3	2,4
100	2,5	2,5	2,0	1,5	2,2
200	2,1	2,8	3,0	2,2	2,4
300	3,1 a	2,3 b	2,4 b	2,2 b	2,5 b
Ef. de doses	N.S	N.S	N.S	N.S	N.S
30-40cm Depth					
0	2,0	1,9	1,9	1,8	2,3
50	2,3	2,5	2,4	2,6	2,9
100	2,3	2,6	2,3	2,2	3,2
200	2,3	2,6	2,3	2,3	2,8
300	2,1 c	3,1 ab	2,50 bc	3,60 a	2,6 bc
Ef. de doses	N.S	L*(2)	N.S	L*	N.S

- **In depth of 0-10 cm, the source that released more P to the system was MAP, which showed a linear dose effect. In the lower dose there was no significant effect between sources applied.**
- **Both doses of 100 and 200 mg dm^{-3} of P solid in mineral fertilizer had high availability of P followed by other sources. MAP at the highest dose provided higher values of P, followed by ST; The others did not differ.**
- **Testing effect of dose was significant only for solid mineral fertilizers and liquid mineral, with increasing effect. In the depth of 10-20 sources differ only at the highest dose, and MAP showed higher available P 28.08 mg dm^{-3}. To effect dose effect MAP and ST showed a linear growth.**
- **Organomineral fertilizer at the highest dose at a depth of 20-30 cm showed the highest value of available P 3.10 mg dm^{-3} stood out from the others that showed average values between 2.16 to 2.50 mg dm^{-3} not for the purpose of dose was significant for the tested sources.**
- **In the depth of 30-40 cm occurred only difference between fertilizer at the highest dose, and the MAP + H2O showed higher available P 3.6 mg dm^{-3} and the solid organic-showed the lowest value 2.07 mg dm^{-3} among the different sources. Effect of dose at this depth was linear and verified in solid and liquid fertilizers in MAP source.**

Conclusion





The fertilizer MAP was the source of P who had higher levels of available soil P.

Funding: