TITLE: PHOSPHATE SOLUBILIZERS IN CORN AND WHITE OAT RIZOSPHERE, IN LATOSOL WITH APPLICATION OF THAT NUTRIENT.

AUTHORS: GAYGER, L. A.; MANICA, J.; ESCOSTEGUY, V. A. P.; TONIAL, F.; FALCÃO, F.; Mar, B. T.

INSTITUTION: UNIVERSITY OF PASSO FUNDO, PASSO FUNDO, RS (AV. BRASIL LESTE, 285 - SÃO JOSÉ, 99052-900, STEP FUNDO -RS, BRAZIL).

ABSTRACT:

Many soil microorganisms can solubilize soil phosphorus (P), making it available to plants as plant growth promoting bacteria, but few studies report the effect of phosphate fertilization on grain crops under no-tillage. The objective of this work was to evaluate the effect of P doses on phosphate solubilizing bacteria, corn rhizosphere and white oats. The experiment was conducted in the Experimental Area of the University of Passo Fundo, in Passo Fundo, RS, in a humid dystrophic Red Latosol. The treatments were evaluated in a factorial of 2 crops (oats and corn) x 2 levels of P (0 and 60 kg / ha of P2O5), with 4 replications, in a randomized complete block design. The source of P applied was triple superphosphate. The rhizosphere soil was sampled in May 2019 after the soybean crop. This crop was cultivated without phosphatic fertilization, in the plots where this fertilization was carried out in maize and white oats. The phosphate solubilizing bacteria were isolated and quantified from soil samples adhered to the roots and collected in the 0 to 15 cm layer. For the isolation of these bacteria, the samples were sieved (2 mm) and 1 gram of soil was suspended in 99 ml of 9% saline solution (nacl) and a dilution of 10 -2 was prepared. Aliquots of each dilution (100 ul) were transferred to Petri dishes containing Pikovskayas agar. The assays were maintained at 35 ° C for two days. All colonies were quantified, but only those with a clear zone around the Colony were considered phosphate solubilizers. The number of colonies and halo were submitted to analysis of variance. This analysis indicated effect of P applied to the halo, but there was no effect on the amount of colonies in corn rhizospheres and white oats. The type of culture did not influence the number of halo ($p = 0.8799$) and colonies ($p = 0.4588$), and there was no interaction between cultures and doses of P in these variables. The application of this nutrient in maize and white oats reduced the amount of halo compared to the control (Soil without P application). Correlation analysis indicated association ($p = 0.02$) between halos and colonies ($r = 0.58$). It was concluded that the dose of P applied with the fertilizer negatively influences the activity of phosphatase solubilizing bacteria. This indicates that phosphate fertilization may alter the biochemical activities of these organisms, reducing the potential effect of phosphate solubilizing bacteria as a plant growth promoter.

Keywords: Quality of P solubilizing bacteria; Phosphate solubilization capacity; Rhizosphere