MA-0425

Yield increase of maize in the Midwest region of Brazil through inoculation of endophytic and rhizosphere phosphate-solubilizing bacteria

VP Ribeiro[1], EA Gomes[2], JF Figueiredo.[2], JM Pinho[2], IE Marriel[2], UG Lanna[2], CA Oliveira[2]
[1] Universidade Federal de São João del Rei, Brazil.
[2] Empresa Brasileira de Pesquisa Agropecuária Milho e Sorgo, Brazil

Insoluble phosphate rocks associated with phosphate solubilizing microorganisms (PSM) have been used for developing a low cost and safe technology for replacing and/or supplement the phosphorus fertilization in agricultural soils. The aim of this study was to evaluate the influence of endophytic and rhizosphere phosphate-solubilizing bacteria (PSB) on corn productivity in the tropical savanna soil fertilized with phosphate rock and triple superphosphate. The experiment was performed in 2014/15 season, in an experimental field located in Goiânia, State of Goiás, in the Midwest region of Brazil. The effect of PSB on corn yield was assessed with nine bacterial strains inoculated on corn seeds and the experiment was arranged in a split-plot design with three replicates. Each replicate consisted of four rows measuring five meters with 0.70 meters between rows. Three types of phosphate fertilizer differing by the total quantity (superphosphate, ½ dose Surperphosphate and ½ Araxá Phosphate, and the control with ½ Surperphosphate) in 100 kg P2O5/ha were applied to the soil. The grain yield was estimated and the data were submitted for analysis of variance (ANOVA). Means were compared by Tukey test at 5% probability. The results showed a significant difference between the bacterial strains and the phosphorus source. There was a significant response to inoculation with the strains E2 and E4 isolated from rhizosphere soil and the E10 endophytic strain compared with the other six strains and the control (not inoculated), regardless of fertilization rate. In general, inoculation with these strains improved the productivity in up to 21%, and although not statistically significant, the phosphorus in grain increased by an average of 16% compared to the control plants. We conclude that the productivity of corn kernels can be stimulated by seed inoculation with PSB, and the effects depend on both the type of phosphate fertilizer and bacterial strain.