

MA-0451

NITROGEN CONCENTRATION IN PLANT AND POPULATION DIAZOTROPHS IN MAIZE RHIZOSPHERE INFLUENCED BY AZOSPIRILLUM APPLICATION METHOD

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The use of inoculants based on nitrogen-fixing bacteria technology in agriculture is a viable alternative to reduce dependence on imported synthetic fertilizers, and mitigate the economic and environmental impacts. In the case of maize crops, the efficiency of bacteria plant interaction - also depends on optimization. This work aimed evaluate the influence of *Azospirillum brasilense* application methods on N uptake and diazotrophic population of the rhizosphere. The experiment was conducted in the agricultural year 2012/2013 in soil classified as dystrophic Hapludox in experimental area of Embrapa Maize and Sorghum, Sete Lagoas, Minas Gerais, Brazil. Seven methods of application of inoculant were compared: furrow application, via spray, the seed; foliar application to 10 days after germination (DAG 10); furrow + foliar to 20 DAG; seed + 20 to DAG; foliar 10 to DAG and 20; and control without inoculation), and topdressing nitrogen doses (0, 40 and 80 kg ha⁻¹ N). Using randomized block design with split plot, with levels of N in the plots and application of methods in sub-plots. The inoculant constituted a mixture of two strains of *Azospirillum brasilense*. For applications via spraying was used a suspension mixture of two strains of cells (108 UFC / mL). For the seed inoculation, was used the solid inoculant using charcoal as carrier, containing the equivalent cell density. In the flowering stage, three plants were collected per plot for nutrients determining and rhizosphere soil samples to quantify the most probable number (MNP) of diazotrophic microorganisms. The plants nutrient content were carried out in an optical emission spectrometry plasma. Soil samples were subjected to serial dilution and aliquot was transferred for three tubes with nitrogen-free (Nfb) semi-solid. The positive tubes were used for estimation of MNP from of McCrady table. There are significant differences in concentration of N and diazotrophic population in the rhizosphere of plants. The application methods of inoculation in the furrow via spraying, via seed and seed + spraying 20 DAG showed similar agronomic efficiency, and superior to other method. On the other hand, larger populations of rhizosphere diazotrophic were observed in 10 DAG spray methods (59 x 10³) and spraying DAG + 10 20 dkg (51 x 10³) depending on the applied N rate. It is concluded that the inoculation method influence the absorption of nutrients and diazotrophic population present in the rhizosphere of plants.