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Grain productivity sorghum grain production influenced by *Azospirillum brasilense* strains

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The production and food offering, in particular, of animal protein imply in large consumption of grain for rations agricultural industry. The cereals, maize or sorghum, which represents the main energy component of animal diets, require nutrients in high quantities, primarily of nitrogen. This nutrient can be supplied in part by biological nitrogen fixation process whose efficiency depends on the strain used in the inoculant. This work has proposed to evaluate the efficiency of different isolates of diazotrophic bacterial associated with the culture of sorghum grain, aiming at substituting nitrogen fertilization recommended for this culture. The experiment was conducted with the cultivar BR 304 on field conditions, in a soil classified as Dystrophic Red Latosol - brazilian savanna phase. 20 strains of *Azospirillum* sp. were tested (A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, and A20) of the Microorganisms Multifunctional Culture Collection of the Embrapa Maize and Sorghum, and three levels of N (N0: witness, N1 30 and N2: 60 kg ha⁻¹) applied to cover in the form of urea, in a randomized complete block design with three replications. For obtaining the inoculants, the strains were cultivating in a culture medium soybean liquid triplicaseina, under stirring for 72h at 29°C. Then cultures were centrifuged, resuspended in saline (0.85% NaCl) and adjusted to Optical Density approximately 108 viable cells per ml. Each cell suspension was mixed with charcoal at a ratio of 2,5:1. The inoculation was performed in seeds, previously moistened with glue cassava starch-based (5% p/v), at the time of planting. The experimental parcels were constituted four lines of five meters long, spaced 0,7 m between rows and 0,10 m between plants. In addition to grain productivity (PG in Portuguese) 13%, were evaluated the dry mass accumulation and aerial portion of the nitrogen plants, in the flowering stage. According to the statistical analysis, there was significant difference ($p < 0,05$) among the treatments tested for PG, and the mean values obtained ranged from 2960 to 5593 kg ha⁻¹. It was verified that the A10 strain showed the highest efficiency with respect to productivity, which afforded gains of up to 60% over the control, 39% in relation to 30 kg/ha N and 21% compared to 60 kg/ha of N. The other parameters did not differ, depending on the strains tested. The variability observed demonstrates the potential for efficient selection of strains *Azospirillum brasilense* inoculants for formulation aimed at replacing at least part of the nitrogen fertilization in sorghum crop.