

TITLE: MAIZE PLANTS RESPONSE TO INOCULATION WITH *AZOSPIRILLUM BRAZILIAN* UNDER THREE LEVELS OF NITROGEN AND CHEMICAL SEED TREATMENT

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ABSTRACT:

Maize production depends on the intensive use of chemical fertilizers, mainly nitrogen, which represents a significant portion of the production cost, besides negative environmental impacts and import dependence. A promising alternative to mitigate these impacts of nitrogen fertilization is the use of the inoculation process with nitrogen fixing bacteria in the atmosphere, which involves the association of bacteria of the genus *Azospirillum brasilense* with the plant. The efficiency of this interaction is influenced by biotic and abiotic factors. The objective of this work was to evaluate the influence of the seed treatment on the efficiency of the inoculation with *Azospirillum brasilense* in the maize crop. The experiment, conducted in an experimental area of Embrapa Milho and Sorgo, Minas Gerais, contained 18 treatments: Inoculant applied to the furrow-seed with chemical treatment; Inoculant applied to the furrow-untreated seed; Seed inoculum- seed with treatment; Seed inoculum- untreated seed; Treatment without inoculation and treated seed; Treatment without inoculation and untreated seed combined with three doses of N in coverage (0, 60 and 100 kg ha⁻¹ N). Cover fertilization was undertaken 30 days after seed germination. The trial design was randomized complete blocks, with subdivided plot, a randomized complete block design was used, with a subdivide plot, being N dose in the plots and other treatments in the subplots. The accumulation of dry mass, nitrogen and phosphorus and potassium content in the aerial part of the plants in the flowering stage and grain yield was evaluated. Significant differences were observed as a function of nitrogen application for all analyzed parameters. On the other hand, we observed non-significant effects of the factors evaluated on plant growth and nutrient absorption. However, up to 62% gain in the dry matter accumulation in the inoculated plants was observed in relation to the control without inoculation with treated seeds, depending on the availability of nitrogen in the soil. Regarding grain yield, inoculation provided an average increase of 17%, although not significant (p> 0.05%). It was concluded that the treatment of the seed did not influence the response of the maize crop to the inoculation with bacteria of the genus *Azospirillum*.

Keywords: N₂ fixation, chemical fertilizers, N. availability.

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