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Agronomical Performance of Common Bean Inoculated with New Rhizobial Isolates

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Abstract

Common bean (*Phaseolus vulgaris* L.) is a leguminous plant of great importance for the Brazilian population, especially for the poorer population by representing the main source of protein. Common bean can establish symbiosis with nitrogen-fixing bacteria to obtain N from the atmosphere through Biological Nitrogen Fixation (BNF) process. This work aimed to evaluate the agronomic efficiency of rhizobia isolates under field conditions in two sites: Guapó and Santo Antônio de Goiás, by comparison of their results with the commercial strains SEMIA 4077, 4080 and SEMIA SEMIA 4088 of *Rhizobium tropici*. We evaluated the number of nodules (NN), nodules dry weight (NDW), root dry weight (RDW), shoot dry weight (SDW), stand (S), leaf area (LA), number of pods (NP), number of grains (NG), 100 grains dry weight (100GDW), grain yield (GY) and levels of macro and micronutrients in the shoots of common bean plants. The results revealed significant differences for NN, SDW, NP, NG and GY among the treatments evaluated in Guapó. In the experiment carried out in Santo Antônio de Goiás significant differences were observed among treatments for NDW, RDW, LA, SDW, NP, NG and GY. The content of micro and micronutrients varied significantly among all of the isolates while in Santo Antônio de Goiás no significant differences were found for Fe and Mn. About 70% of the isolates evaluated in Guapó showed relative efficiency of grain yield similar to the strains SEMIA 4077, SEMIA 4080 and SEMIA 4088. In Santo Antônio de Goiás all of the evaluated isolates showed the same efficiency of those strains. The inoculation with the isolates contributed on a significant way for the grain yield increasing with results similar to the N treatment and commercial strains. These results indicate that is possible to find isolates more efficient than the commercial strains on the BNF process.

Keywords: BNF, common bean, rhizobia, symbiosis