

TITLE: THE EFFECT OF THE APPLICATION OF *Bacillus* spp. ISOLATES FOR THE CONTROL OF ROOT-KNOT NEMATODES AND DEVELOPMENT OF COMMON BEAN

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ABSTRACT:

Among the diseases that limit the production of common beans (*Phaseolus vulgaris* L.), the ones caused by nematodes of the genus *Meloidogyne* are among the most recurrent diseases. Currently, among the most used methods for the management of nematodes, the use of chemical nematicides, resistant cultivars, crop rotation and biological control using fungi and bacteria can be cited. Among the genera of bacteria with antagonistic power of greater relevance, *Bacillus* spp. is notable for forming endospores resistant to adverse conditions and present a multiplicity of mechanisms antagonistic to nematodes. The objective of this study was to evaluate the efficiency of the application of different isolates of *Bacillus* sp. in the control of *Meloidogyne incognita* in the common bean crop. The assay was performed in a field condition in an area naturally infested by *M. incognita* in the municipality of Patos de Minas (MG). The assay was conducted with cv. Peróla, during the summer in 2018/2019, using a randomized complete block design with six replicates. Four isolates of *Bacillus* spp. (I307, I311, I312, I315) were used and adjusted to a concentration of 1×10^9 CFU.mL⁻¹. The experiment consisted of nine treatments: (1) control, (2) I307 in seed treatment (ST), (3) I307 in-furrow application (FA), (4) I311 in ST, (5) I311 in FA, (6) I312 in ST, (7) I312 in FA, (8) I315 in ST and (9) I315 in FA. The used doses were 2 mL.kg⁻¹ of seed in ST and 200 mL.ha⁻¹ in FA. The initial population (planting) and final (harvest) of juveniles (J2) in the soil were evaluated for the calculation of reproductive factor. At the 75th day after planting (DAP), dry mass of shoot (leaf and stem) and pod were evaluated separately. Productivity was calculated after grain harvest at 110 DAP. The obtained data were submitted to analysis of variance and later to the LSD test at 5% of probability. The means of reproduction factor did not differ from the control treatment, demonstrating that none of the isolates presented efficiency to control *M. incognita*. Regarding to the dry mass of the pod, there was no significant difference between the treatments, however, the isolate I312 was able to promote aerial part growth in both forms of application, increasing the dry mass of aerial part in 30.5 and 21.9% in ST and FA, respectively, in relation to the control treatment. No isolates promoted a statistical significant increase in productivity.

Keywords: *Meloidogyne incognita*, rhizobacteria, biological control