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INTRODUCTION

Common bean (*Phaseolus vulgaris* L.) has a great importance as a food crop worldwide and Brazil has a production about 3.29 million tons (FAO, 2014). Nitrogen (N) is the nutrient most absorbed and extracted by common bean and its use has a significant influence on yield. Due to the high cost of nitrogen fertilizers and the losses of this nutrient in the soil, which contributes to environmental pollution, it is of great interest to search for techniques that can maximize its efficiency. Although bean plants have the capacity to establish mutual symbiosis with bacteria, biotic and abiotic factors can act to reduce the efficiency of this relationship. This study aimed at evaluating the efficiency of inoculation practice with rhizobia and doses of nitrogen on production components of common bean.

MATERIAL AND METHODS

The experiment was conducted at Experimental Farm of the Vale do Rio Verde University situated in Três Corações city (21°42'S, 45°15' and altitude of 855 m), in the Minas Gerais State, Brazil, during the 2015 dry growing season. The soil of the experimental area was classified according to Brazilian classification as a Dystroferic Red Latosol (EMBRAPA, 2013). A randomized block experimental design was implemented, with three replicates. Treatments were arranged as a factorial 2x7 (presence/absence of inoculant x 7 doses of nitrogen). Seeds from 'Pérola' cultivar (Carioca grain) was inoculated with the commercial product Total Nitro® which is constituted by *Rhizobium tropici* strain SEMIA 4077 and *Rhizobium tropici* strain SEMIA 4080. Nitrogen fertilization was performed using urea at the planting furrow and topdressing. Each plot consisted of four 4-m-long rows spaced 0.5 m apart (8 m^2). The seed density was 18 seeds m^{-1} at a depth of 3-4 cm, and it was thinned out to 15 plants 20 d after sowing. Regarding the fertilization and irrigation, the plants were managed according to the technical recommendations for the crop. Weeds were controlled using manual weeding whenever necessary and pest and disease control was not required. At 100 DAE, the plants were collected from each plot to measure the number of pods per plant, number of grains per pod, 100-seed weight, final stand, and grain yield. The data were subjected to analysis of variance and, in case of significance, the means were compared by the Scott-Knott's test ($P \leq 0.05$), using the R software (R Development Core Team, 2011).

RESULTS AND DISCUSSION

According to the Table 1, significant differences ($P \leq 0.05$) were not observed for the interaction inoculation x doses of N for all evaluated variables, with exception of number of pods per plant. For this characteristic, the inoculated plants presented superiority over the non-inoculated ones, without affecting the final yield. Several authors point out that this characteristic is closely related to the plant genetics. According to Arf et al. (2008), this item is a feature of high heritability and, therefore, closely related to the cultivar.

For the other evaluated characteristics, no statistical difference was observed between treatments. Many factors may have contributed to the achievement of these results since nitrogen fixation is closely related to the climatic variables and genetic characteristics of each cultivar as reported by Araújo et al. (1996) and Lemos et al. (2003). These authors evaluated the nodulation in bean cultivars and reported that the cultivar 'Carioca Precoce' presented better symbiotic performance in relation to other cultivars, and it is probable that the results found in this study are related to the cultivar used.

Table 1 Values obtained for 100-seed weight (SW, in g), number of pods per plant (NPP), number of grains per pod (NGP), final stand (FS, in 1,000 plants per ha) and grain yield (GY, in kg ha^{-1}) of common bean cultivars grown at the 2015 dry growing season at Três Corações, Minas Gerais, Brazil.

Treat.	SW^{ns}		NPP*		NGP^{ns}		FS^{ns}		GY^{ns}	
Doses of N	**I**	**NI**	**I**	**NI**	**I**	**NI**	**I**	**NI**	**I**	**NI**
0	29.1a	28.9a	12.8a	10.8a	4.4a	4.5a	165a	215a	1242.7a	1158.7a
20	27.8a	28.3a	11.9a	13.3a	4.5a	4.4a	171a	177a	1228.7a	1399.3a
40	30.6a	29.6a	13.3a	10.5a	4.4a	4.5a	142a	219a	1184.7a	1697.3a
60	30.4a	31.5a	15.3a	10.4a	4.6a	4.1a	159a	193a	1428.7a	1469.3a
80	31.0a	28.4a	16.0a	12.6a	4.3a	4.2a	185a	170a	1580.0a	1396.7a
100	28.6a	29.7a	15.3a	10.6a	4.6a	4.3a	185a	178a	1755.3a	1029.3a
120	30.6a	32.3a	15.0a	13.8a	4.5a	4.3a	177a	139a	1657.3a	1350.0a
Means	29.7A	29.8A	14.2A	11.7B	4.5A	4.3A	169A	184A	1439.6A	1357.2A
CV(%)	9.0		17.8		5.8		21.47		25.03	

Means followed by the same lowercase letter in the columns and uppercase letter in the rows are not significantly different at $P \leq 0.05$ using Scott-Knott's test. CV = coefficient of variation; I = inoculated plants; NI = non-inoculated plants

In this study, we found satisfactory value for soil organic matter (2.91 dag kg^{-1}). The mineralization of this organic matter by the bacteria present in the soil probably caused an availability of N for the plants that received lower doses of N, then showing no statistical differences for doses.

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