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INOCULATION AND LEAF FERTILIZATION OF MOLYBDENUM AND COBALT ON SNAP BEAN YIELD

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INTRODUCTION: The snap bean (*Phaseolus vulgaris* L.) is a vegetable consumed around the world. The physiological and morphological quality of pods are important characteristics for determinate the commercial pattern, so techniques must to be used for increase the production of pods. Inoculation and application of nutrients on the leaves are management practices with great response and low cost.

The aim of this work was to evaluate the seed inoculation with *Rhizobium tropici* strains and the leaf application of molybdenum and cobalt on the yield of snap bean genotypes with determinate growth pattern.

MATERIAL AND METHODS: The experiment was conduct in a greenhouse and was used the genotype UEL 2. The experimental design was complete randomized with four replications, resulting in a 2 vs. 4 factorial (2- with or without inoculation; 4- doses of commercial product) . The seeds were inoculated with a mix of *Rhizobium tropici* strains (SEMIA 4077, SEMIA 4080 and SEMIA 4088) following the method of Furlan et al. (2016) and the doses used were 0, 50, 100 and 150% of the ML71 recommended dose (mix of molybdenum and cobalt). Were evaluated number of pods per plant, fresh mass of pods and potential yield of snap bean culture. The data was submitted to analysis of variance and the averages were compared by the Tukey test ($p < 0.05$) and adjusted by polynomial regression equations.

RESULTS: The results showed that in the treatments with inoculation of the strain mix was observed an increase in all characteristics, independent the dose applied (Table 1). This phenomena can be attributed to the gain in the process of biological nitrogen fixation, obtained by the symbioses between bean plant and bacteria.

Table 1. Averages of fresh mass of commercial pods (FMCP), number of commercial pods (NCP) and potential yield of UEL 2 snap bean genotype inoculated or no with *Rhizobium tropici* strains mix.

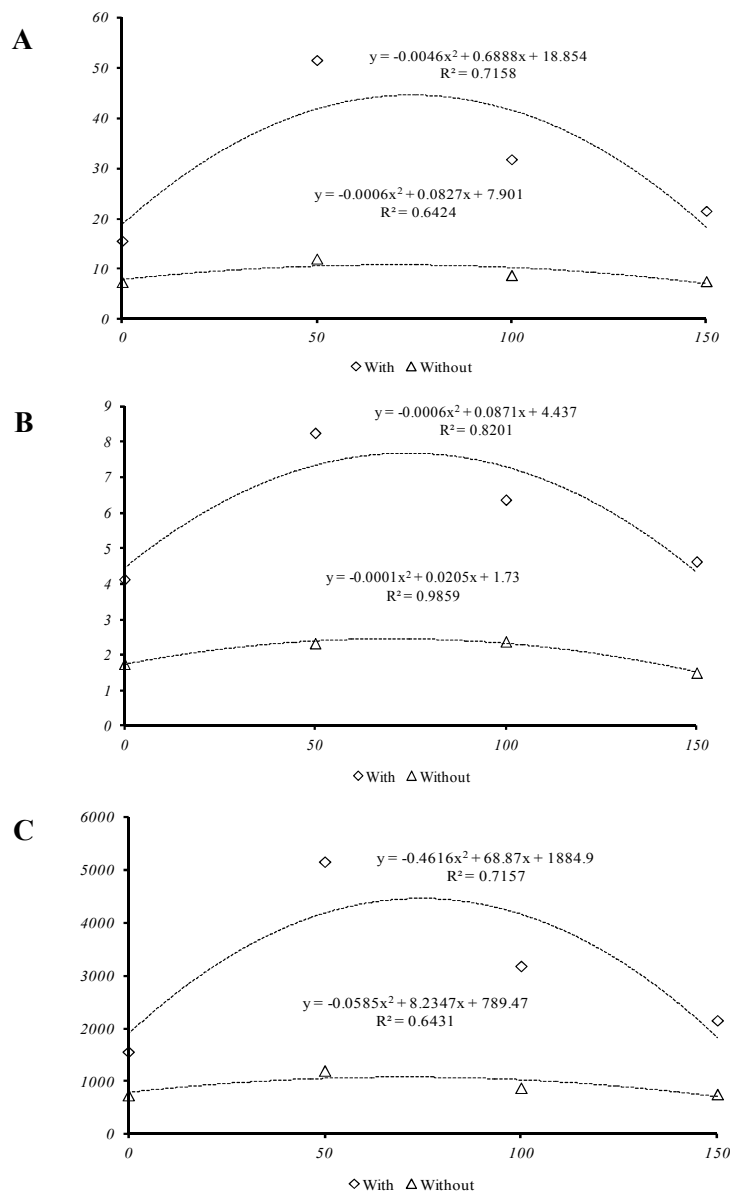
Inoculation	FMCP (g)		NCP		YIELD (kg)	
	With	Without	With	Without	With	Without
Averages	30.11 a	8.96 b	5.45 a	1.99 b	3010.88 a	895.39 b
CVs (%)	8.20		12.78		8.19	

Different letters are significant at Tukey test ($p < 0.05$)

It was observed a significant effect between the sources of variation leaf fertilization (molybdenum plus cobalt) and inoculation (with or without) for all variables. The performance of FMCP, NCP and YIELD was similar (Figure 1), reaching a maximum point with further decrease. This fact can be explained by the toxicity caused by the high doses of molybdenum and

cobalt. Romanini Jr. et al. (2007) observed high levels of yield in the inoculated treatments as well as Jesus Jr. et al. (2004) achieved increase in the productivity of bean plant after leaf fertilization of molybdenum.

Figure 1. Doses of leaf fertilization of molybdenum and cobalt associated with inoculation of *Rhizobium tropici* strains mix in UEL 2 snap bean genotype. A- fresh mass of commercial pods (FMCP) (g), B- number of commercial pods (NCP) and C- potential yield (kg).



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