

## ANSWER OF TWO CARIOCA BEANS CULTIVAR TO THE CHEMICAL AND ORGANIC FERTILIZATION

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### Introduction

The bean plant (*Phaseolus vulgaris* L.) is cultivated in different regions of the Brazil. It is an important protein source, especially for smaller budge populations. The brazilian dry bean production in 2006 was about 3.5 million tons and Paraná state participated with 23.7% of this production (IBGE, 2007). In Brazil the utilization of urban residues *in natura* or composed in soil organic fertilization is a frequent agricultural practice. This work was carried out with the objective to evaluate the effect of the *in natura* urban residues (the grinding of tree branches) and chemical fertilization, on the components of production and the grain yield of two carioca beans cultivar.

### Material and methods

The experiment was carried out at the experimental farm of the State University of Londrina, Londrina, Paraná, Brazil. The experimental design was a randomized block with treatments distributed in a 5x2 factorial arrangement, which the factors were five doses (0, 15, 30, 45 and 60 Mg ha<sup>-1</sup>) of urban organic residues (the grinding of tree branches) and two chemical fertilization levels (without and with inorganic fertilization (80, 50 and 30 kg ha<sup>-1</sup> of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively)), with three replications. Two bean cultivar of the Carioca (Colibri and Eldorado) were tested. The evaluated variables were: pods number/plant (PNP), grain mass/plant (GMP), the 1000 grains mass (M1000) and grain yield. The obtained datas were submitted to variance analyses and the averages were compared by Tukey test at 5% or adjusted to regression equations.

### Results and discussion

The PNP and GMP medium values of the two carioca beans cultivars in the chemical fertilization treatments were significantly higher than those observed in the treatments without fertilization. Only for Eldorado cultivar, the M1000 was influenced by chemical fertilization (Table 1). However, the observed values (230.0 g) were lower than regional average (IAPAR, 2007).

**Table 1.** Pods number/plant (PNP), grain mass/plant (GMP) and 1000 grain mass (M1000) for Colibri and Eldorado beans cultivar in function to chemical fertilization.

Variables	Colibri		Eldorado	
	With fert.	Without fert.	With fert.	Without fert.
PNP	9.8 a	6.5 b	9.3 a	5.5 b
GMP (g)	9.6 a	6.1 b	6.6 a	3.4 b
M1000 (g)	n.s	n.s	186.0 a	167.0 b

Averages followed by the same letter in the lines for each cultivar, do not differ by Tukey test at 5%.

The grain yield of the Eldorado cultivar was significantly influenced by chemical and organic residue fertilizations. In the absence of chemical fertilization, the grain yield reduced with the increase of the residues doses ( $y = 2686.5 - 86.621x + 1,129 x^2$ ,  $r^2 = 0,88$  and minimum grain yield in  $38,5 \text{ Mg ha}^{-1}$ ).

In the treatments with chemical fertilization, the significant effects ( $p < 0,05$ ) were observed only for residue doses which was above than  $15 \text{ Mg ha}^{-1}$ , however for all the treatments the grain yield were below of the regional average of  $2948 \text{ kg ha}^{-1}$  (IAPAR, 2007).

Except for grain yield of Eldorado cultivar, the organic residues did not affect the values of the other studied variables. The highest values were observed to treatments with chemical fertilization. These results are in agreement with those obtained by Andrade et al. (2005). Only for the Colibri cultivar, were obtained significant and positive correlation among the variables PNP and GMP and the grain yield ( $r=0,75$  and  $r=0,79$ , respectively).

### Conclusions

The fertilization with organic residues reduced the grain yield of Eldorado bean cultivar, but did not have a significant effect on the Colibri bean cultivar

The highest values for grain yield, pods number per plant and grain mass per plant were obtained for the Colibri bean cultivar when inorganic fertilizer was used.

### References

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