

# COMPARATIVE RESPONSES OF COMMON BEAN TO DIFFERENT SOWING DATES OF GREEN MANURES

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## INTRODUCTION

Little emphasis has been given to the effectiveness of the N supply by green manures (Muraoka, 1984), despite the use of green manure may represent a cheap alternative to supply N requirements for the crops. However, many of the plants used as green manure are sensible to the day length (photoperiod), which can result in different amount of dry mass production according to the cropping season. Consequently, the quantity of N provided by these plants for the crops may vary among cropping seasons.

## MATERIALS AND METHODS

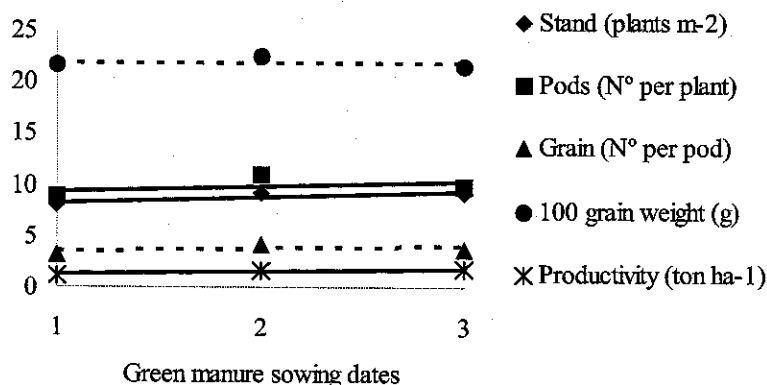
Aiming to evaluate the effect of different sowing dates of green manures on the common bean (*Phaseolus vulgaris* L.) crop, a field experiment was carried out at the Embrapa Arroz e Feijão. The green manures used were *Crotalaria juncea*, *Crotalaria ochroleuca*, *Cajanus cajan*, *Canavalia ensiformis* and *Mucuna aterrima*, sowed in three different dates (November 28<sup>th</sup> and December 12<sup>th</sup>, 2007 and February 13<sup>th</sup>, 2008). At the flowering, green manures were managed using a disc plough, followed by the common bean sowing. The experiment was performed in a randomized block design with three replicates. For each date of green manure sowing it were evaluated the stand, number of pods per plant, number of grains per pod, 100 grain weight and the productivity of common bean crop.

## RESULTS AND DISCUSSION

On the first and third sowing dates it was not observed significant differences on the dry mass production of the green manures (Table 1). On the second sowing date, *Cajanus cajan* showed the greatest dry mass production (Table 1). The regression analysis revealed a significant effect of the sowing dates of the green manures on the stand, number of pods per plant and productivity of common bean (Figure 1), as an effect of a greater dry mass production of the green manures on the second sowing date, as related above. This effect was only observed on the second sowing date, in which were observed the greater stand and number of pods per plant after *Crotalaria ochroleuca* cropping and greater productivity after *Crotalaria juncea* and *C. ochroleuca* cropping (Table 1). Although *Cajanus cajan* had shown a greater dry mass production on the second sowing date, it was not observed a direct effect of the dry mass production on the common bean productivity (Table 1). This fact may be related with the content of N present in the plant tissues and, consequently on their capacity of N supplying.

## REFERENCE

MURAOKA, T. Utilização de técnicas nucleares nos estudos da adubação verde. In: ENCONTRO SOBRE ADUBAÇÃO VERDE, Rio de Janeiro, 1983. Anais... Campinas: Fundação Cargill, 1984. p. 330.



**Figure 1.** Regression analysis of agronomic parameters of production of common bean in response to different sowing dates of green manures. Dotted lines means non significant regression.

**Table 1.** Dry mass production of green manures and production components of common bean in response to sowing date of green manures.

Sowing date	Green manure		Common bean				
	Specie	Dry mass (ton ha <sup>-1</sup> )	Stand (plants m <sup>-2</sup> )	Pods (N° plant <sup>-1</sup> )	Grain (N° pod <sup>-1</sup> )	100 grain weight (g)	Productivity (ton ha <sup>-1</sup> )
1 <sup>st</sup>	<i>C. juncea</i>	6.41 a	8.33 a	8.93 a	3.29 a	21.94 a	1.32 a
	<i>C. ochroleuca</i>	6.71 a	8.33 a	8.67 a	2.97 a	22.07 a	1.29 a
	<i>C. cajan</i>	7.38 a	8.33 a	9.17 a	3.42 a	21.04 a	1.35 a
	<i>C. ensiformis</i>	5.78 a	7.00 a	7.73 a	2.93 a	22.44 a	1.00 a
	<i>M. aterrima</i>	6.13 a	7.67 a	9.23 a	3.53 a	20.30 a	0.73 a
2 <sup>nd</sup>	<i>C. juncea</i>	6.62 b	8.67 b	11.70 ab	4.73 a	23.56 a	1.88 a
	<i>C. ochroleuca</i>	6.27 b	9.67 a	14.87 a	5.00 a	20.60 a	1.91 a
	<i>C. cajan</i>	9.73 a	8.67 b	8.80 b	3.43 a	23.40 a	1.06 b
	<i>C. ensiformis</i>	4.22 b	9.33 ab	9.67 ab	3.74 a	21.93 a	1.55 ab
	<i>M. aterrima</i>	5.70 b	9.00 b	9.13 b	3.89 a	22.61 a	1.69 ab
3 <sup>rd</sup>	<i>C. juncea</i>	5.72 a	9.00 a	10.07 a	3.20 a	21.34 a	1.24 a
	<i>C. ochroleuca</i>	4.62 a	9.67 a	9.63 a	3.97 a	21.12 a	2.09 a
	<i>C. cajan</i>	3.82 a	8.33 a	10.27 a	3.76 a	20.47 a	1.78 a
	<i>C. ensiformis</i>	3.91 a	9.00 a	8.40 a	3.31 a	22.46 a	1.47 a
	<i>M. aterrima</i>	5.38 a	9.33 a	10.23 a	4.52 a	22.04 a	1.94 a
CV (%)		18.94	11.05	22.65	21.38	7.23	30.69

Means followed by the same letter in the column, within green manure sowing time, are not different by Tukey's test ( $p < 0.05$ ).