

## COMMON BEAN PRODUCTION ON TOP OF FIELD CROP RESIDUES IN NO TILL SYSTEM AND RESPONSE TO NITROGEN APPLICATION IN OXISOL OF BRAZILIAN SAVANNAH.

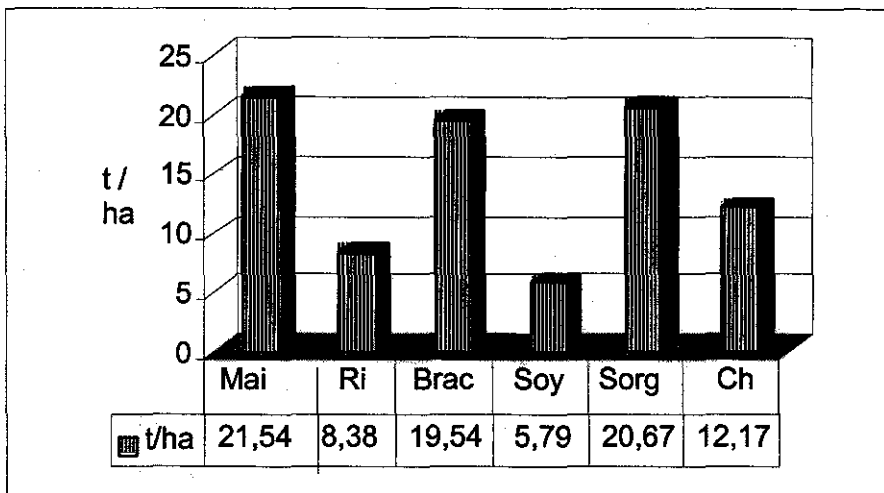
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Research evidences have indicated economic bean responses to nitrogen top applications up to 130 kg/ha presenting grain yields over 3000 kg/ha (Barbosa Filho et al. 1996, Yokoyama et al. 1996). Nutritional factors may cause yield losses in irrigated beans under direct seeding especially related to nitrogen deficiencies.

Nitrogen fertilization must be better understood if studied in parallel with crop residue stored at the soil surface in no till system. Generally, a C/N imbalance are observed in any field researches cropped with dry bean (*Phaseolus vulgaris* L.). Nitrogen deficiencies are observed in these crops due the high increasing of carbon came from the dry matter production of previous crops (Oliveira et al. 1996)

Maize and sorghum are high residue producer crops similar to *Brachiaria* grass in single crop. Rice and soybean can be considered low residue producers (Figure 1).



**Figure 1.** Dry weight of crop residues in no till system, at Fazenda Santa Fé, Municipality of Santa Helena de Goiás, Brazil.

(May = maize, Ri=rice, Brac = *Brachiaria brizantha*, Soybean, Sorg=sorghum and Ch=check).

In order to evaluate the common bean response to nitrogen doses when cultivated over plant residues. a field experiment was carried out using Pérola cultivar subjected to nitrogen top applications of 45, 90, 135, and 180 kg/ha. The oxisol used was a Oxisol classified as Purple Latosol of Santa Helena from Fazenda Santa Fé, Goiás State.

**Table 1.** Mean production of dry bean (kg/ha), Pérola cultivar, in no till system during winter season in response to increasing doses of nitrogen applied as ammonium sulfate at Fazenda Santa Fé, Municipality of Santa Helena, GO.

N. kg/ha	CROP RESIDUE				
	Maize*	Rice*	Brachiaria	Soybean*	Sorghum*
45	3.374	2.484	3.047	3.139	3.198
90	3.455	2.833	3.294	3.185	2.901
135	3.781	2.467	3.404	3.604	2.900
180	3.421	2.159	3.275	3.162	3.542
<b>Mean</b>	<b>3.508 a</b>	<b>2.486 b</b>	<b>3.255 a</b>	<b>3.273 a</b>	<b>3.135 ab**</b>

Bean on crop + brachiaria residue. \*\*The means in the line followed by the same letters are not significantly at  $P < 0.05$ .

Results obtained did not indicate significant differences among doses of nitrogen and it was concluded that adequate soil management in addition to proper soil fertility as well as the maintenance of soil humidity provided by the soil protection due to the presence of plant residues favor the application of low nitrogen amounts. Significant differences were observed, however, in relation to differences in crop residues. The highest yield was observed when the dry bean was cultivated over residues from maize inter-cropped with Brachiaria (3508 kg/ha) followed by soybean (3273 kg/ha), Brachiaria (3255 kg/ha) and rice (2486 kg/ha) in single crops (Table 1).

### References

- Barbosa Filho, M.P.; Silva, O.F. da. Adubação nitrogenada de cobertura e seu efeito econômico na cultura do feijoeiro irrigado. Santo Antônio de Goiás: Embrapa Arroz e Feijão, 1999.2p.(Embrapa Arroz e Feijao. Pesquisa em Foco, 31).
- Oliveira, I.P. De; Araújo, R.S.; Dutra, L.G. Nutrição mineral e fixação biológica do nitrogênio. In: ARAUJO, R.S. *et al.* (Coord.). Cultura do feijoeiro comum no Brasil. Piracicaba: Potafos, 1996. p.169-221.
- Yokoyama, L. P. et al Aspectos socioeconômico da cultura. In: Araujo.S; Rava, C. A.; Stone, L. F Zimmermann, M.J.O. Cultura do feijoeiro comum no Brasil. Piracicaba: Potafos, 1996.cap1,1—22p.