# EVALUATION OF NITROGEN FERTILIZATION ON LEAF NITROGEN CONCENTRATION AND BEAN YIELD IN IRRIGATED NO TILL SYSTEM CROPPED ON PLANT RESIDUES[1]

I.P. Oliveira[2], R. M. Oliveira[2], B. A. Miranda[3], A. M. Barbosa[4] and H. M. Arantes[4]

[1] Research carried out at Centro Nacional de Pesquisa de Arroz e Feijão. Caixa Postal 179. 75 375. Santo Antonio of Goiás. GO. Brazil. [2] Embrapa Arroz e Feijão [3] Escola de Agronomia da Universidade Federal de Goiás [4] Escola de Zootecnia da Universidade Católica de Goiás.

Brazil is one of the largest producers and world consumers of bean, even so, few farmers use irrigation as normal and recommended practice for elevation of grain production. The bean yield oscillations in the last years, of the main States producers of bean, are explained by the variations of cultivated area, suggesting the little significance of the irrigated area with bean cultivation. The good quality of bean grain is obtained in dry season, time in that the rain allow some production, without the practice of irrigation. However, the risk of production break is very high, because the rain distribution presents casual character. Thus, the medium productivity of bean grain, around 763 kg/ha is very low, when compared with the grain yield above 1891 kg/ha that can be obtained with irrigated crops (Zimmermann et al., 1948). No till system is one of the more advantageous cultural practices of tropical area management, where the crop residue is maintained on the top soil that helps to maintain the free water for a more long period and the erosion is controlled, not only by the action of the crop residue, but mainly for the non soil revolving (Balbino et al., 1996). Other advantages of this system would be, the reduction of the production cost and the simplicity of technical execution, in which could be used mainly for crop succession (Fageria & Ghevi, 1999).

In general way, the nitrogen fertilization, mainly in no till system, constitutes an important factor for productivity increasing. The nitrogen fertilization recommendation for irrigated bean crop vary from 40 to 120 kg/ha of N, while the crop in field absorbs for its complete development amounts around 100 kg/ha of N in dry season crop and in nutrient solution absorbs 200 kg/ha of N (Oliveira et. al, 1996). In that way, not always the applied nitrogen amounts are enough to supply the plant needs. The objective of this research was to evaluate the concentration of leaf N of bean plant under increasing doses of N applied on top soil covered with different plant residues on bean yield in irrigated no till system.

The bean, cv. Pérola, was sowed in the spacing of 0.5 m between lines, with 16 to 18 seeds for lineal meter, using a basic fertilization of 150 kg/ha of NPK in 8:20:20 formulation in irrigated system. The bean sowing was made on crop residues in consortium with brachiaria (21.54 t/ha); sorghum (20.67 t/ha); single brachiaria (19.54 t/ha), rice (8.38 t/ha) and soybean (5.79 t/ha of dry matter) in field conditions. The experimental area covered 192 $m^2$. The doses of nitrogen were 45, 90, 135 and 180 kg/ha.

The leaf samples were taken at flowering stage in all the treatments. Each sample was composed by 10 leaves, that were drought in stove for about 72 hours, at temperatures from 65 to 70 °C. The samples were grind and sent to laboratory analysis. The largest medium concentration of leaf N in bean plant was obtained when this crop was grown on corn residue + brachiaria that received 180 kg/ha of N, meantime in medium terms, the maximum concentration of leaf N was obtained when the bean was cropped on residue of the soybean crop (Figure 1), reaching 6% of leaf N.

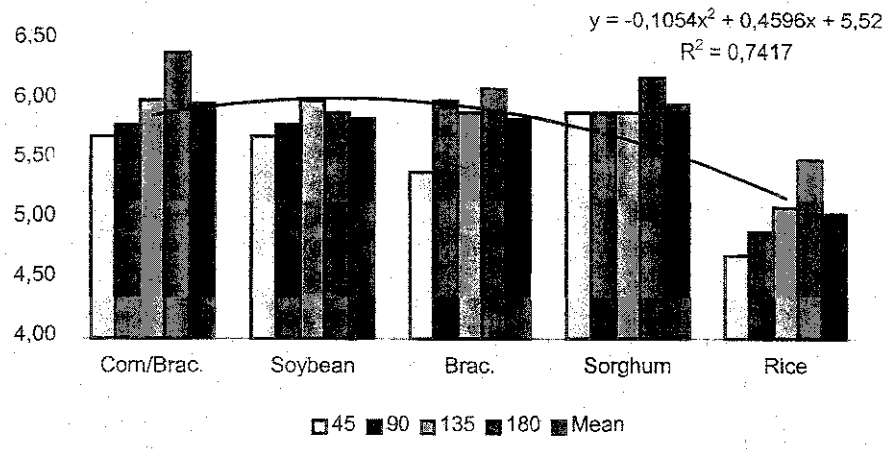


**Figure 1**. Concentrations of leaf N of bean in function of N doses applied on crop residues in irrigated no till system at Santa Fé Farm – Santa Helena de Goiás.

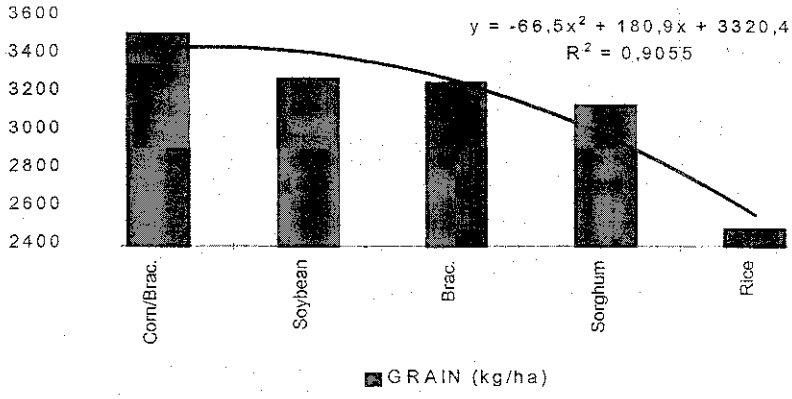


**Figure 2**. Grain yield of bean cropped on plant residue on top soil in irrigated no till system at Santa Fé Farm – Santa Helena de Goiás.

The best grain yield (3 443 kg/ha) was obtained when the bean was cropped on corn-brachiaria residue (Figure 2).

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