

## RHIZOBIUM SELECTION FROM MATO GROSSO DO SUL SOILS FOR DRY BEAN INOCULATION

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Over the last few years, there has been a decrease in the production of the dry bean crop in Brazil, which has occurred mainly due to the low technological level employed. (Merchant et al., 1999; Stralio et al., 2002). Accordingly, nitrogen has been a major limiting factor to the productivity in Brazil. The dry bean plants associated with rhizobia through the symbiotic process can take advantage of this supply of nitrogen, without the cost burden of culture production, establishing an environmentally sustainable process. Although the strains of rhizobium currently recommended for inoculation of bean plants can produce significant increases in productivity, its potential of biological nitrogen fixation (BNF) still is limited to certain environmental conditions and cultivars of bean. This study aimed to evaluate the nodulation and efficiency of symbiotic bean plants inoculated with different isolates of rhizobium soil obtained from various regions of Mato Grosso do Sul, Brazil.

### MATERIAL AND METHODS

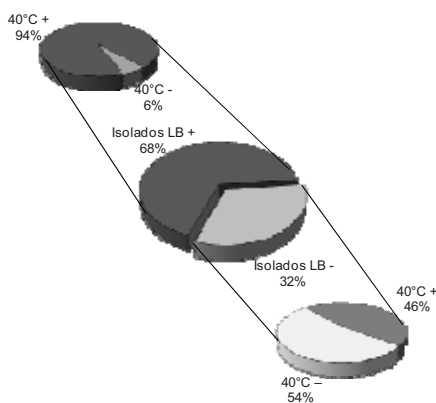
The evaluation was performed in 46 isolates of rhizobia, using as a comparison, two treatments corresponding to the inoculation with the strains CIAT 899 (= 4077 SEMIA BR = 322) and PRF 81 (= SEMIA 4080), *Rhizobium tropici*, which are amongst those commercially recommended for the production of inoculum trade in Brazil, in addition to two treatments used as control without inoculation: fertilization with N-urea (NH<sub>4</sub>NO<sub>3</sub>) and the other without nitrogen fertilization (control). The experimental design was in randomized blocks, with three replications. The nodulation and the symbiotic rhizobia efficiency of the bean plants inoculated, cv. Carioca, were evaluated, using pots of sterilized "Leonard", containing a mixture of sand and vermiculite (1:1, v: v). The growth of rhizobium isolates were also evaluated in the following conditions: in Luria-Bertani medium LB, at 28°C, and in TY medium (tripton-of yeast extract), at 40 ° C.

### RESULTS AND DISCUSSION

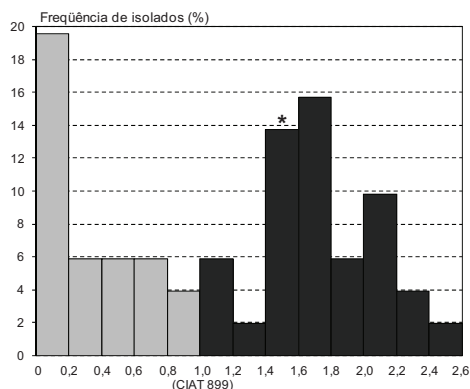
The results showed a correlation between the growth of the rhizobium isolates in LB medium and its tolerance to temperature of 40°C (Fig. 1). Concerning the number of nodules, about 52% of the isolates under evaluation were superior to with the inoculation treatment of strain CIAT 899 and 30% showed superiority to inoculation with the strain PRF 81. As for dry nodules weight, 58% of the isolates of rhizobium from the soils of Mato Grosso do Sul, proved to be superior to the strain CIAT 899 and 48% were superior to the inoculation with the strain PRF 81, as shown in Fig 2. The production of shoot dry matter of the shoot bean plants inoculated with the isolated rhizobia were superior in 50 and 56% when compared with the strains CIAT 899 PRF and 81, respectively.

## CONCLUSION

Insulated from rhizobia, as CPAO 60.2F3, CPAO 84.2F, CPAO 33.3F3, CPAO 32.3F3, CPAO 41.12F3, CPAO 7.5F, CPAO 13.3F3 and CPAO 21.2F, showed a great symbiotic potential for the inoculation in bean plants, opening prospects to obtain more effective inoculants for this culture.



**Fig 1.** Assessment of growth of 50 isolates of *Rhizobium* sp. In LB medium ("Luria-Broth") at 40°C and in TY medium (tripton-of yeast extract).



**Fig 2.** Dry matter of bean plant nodules, cv. Carioca, inoculated with 50 isolates of rhizobium. Values regarding the strain CIAT 899. Averages of three replications.

\*Includes the strain PRF 81.

## REFERENCES

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