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AGROECONOMIC VIABILITY OF CO-INOCULATION IN COMMON BEANS

Da Silva, Osmira Fátima[1], Enderson Petronio **de Brito Ferreira**[1] and Alcido Elenor **Wander**[1,2]

[1] Embrapa Rice and Beans, Rodovia GO-462, Km 12, 75375-000 Santo Antonio de Goias-GO, Brazil. Email alcido.wander@embrapa.br.
[2] Centro Universitário Alves Faria (UNIALFA), Goiânia-GO, Brazil.

OBJECTIVE

To analyse the agroeconomic viability of the common bean cropping system with co-inoculation with *Rizobium tropici* and *Azospirillum brasilense* in several different doses and different forms of application that are economically feasible for the use of bean producers in commercial and family agriculture of the states of Goiás and Minas Gerais, Brazil.

METHODOLOGY

Data source: Agronomic experiments at Embrapa Rice and Beans demonstration units, on family and commercial farms, 2013-2015.
Variety: Pérola ("carioca" commercial grain type).
Treatments: Control Treatment (TC); Nitrogen fertilized witness (TN) (80 kg N/ha); seed inoculation with 2 doses of *R. tropici* (Rt); inoculation of the seed with 2 doses of *R. tropici* plus 1 dose of *A. brasilense* (Rt+Ab1s); seed inoculation with 2 doses of *R. tropici* plus 2 doses of *A. brasilense* (Rt+Ab2s); seed inoculation with 2 doses of *R. tropici* plus spraying of 2 doses of *A. brasilense* (Rt+Ab2p); and inoculation of the seed with 2 doses of *R. tropici* plus spraying of 3 doses of *A. brasilense* (Rt+Ab3p), as described in De Souza & De Brito Ferreira (2017).
Economic analysis => Benefit-Cost-Ratio (BCR).

RESULTS AND DISCUSSION

All agronomic results relevant to this study were described in De Souza & De Brito Ferreira (2017).
The Benefit-Cost-Ratio was higher than 1.0 in all treatments in commercial farming. In family farming, only the nitrogen fertilised witness and inoculation of the seed with two doses of Rhizobium tropici plus spraying of three doses of Azospirillum brasilense had a BCR > 1, i.e., economically viable (Table 1).
However, the highest BCR, i.e. best economic performance, in all cropping systems, was obtained using inoculation of the bean seed with two doses of Rhizobium tropici plus spraying of three doses of Azospirillum brasilense.

Table 1. Benefit-Cost-Ratio of co-inoculation in common bean, in the three-year average of consecutive crops (2013, 2014 and 2015), during the winter crop, with central pivot sprinkler irrigation, in the States of Goiás and Minas Gerais.

Treatment[1]	Goiás state[2] (commercial farming)	Goiás state[3] (family farming)	Minas Gerais state[4] (commercial farming)
TC	1.49	0.83	1.96
TN	1.65	1.03	1.77
Rt	1.69	0.84	1.90
Rt+Ab1s	1.70	0.86	1.93
Rt+Ab2s	1.79	0.95	1.98
Rt+Ab2p	1.73	0.85	2.04
Rt+Ab3p	**1.90**	**1.13**	**2.14**

[1] Treatments: TC = Control treatment; TN = nitrogen fertilized witness; Rt = seed inoculation with 2 doses of *R. tropici*; Rt+Ab1s = inoculation of the seed with 2 doses of *R. tropici* plus 1 dose of *A. brasilense*; Rt+Ab2s = seed inoculation with 2 doses of *R. tropici* plus 2 doses of *A. brasilense*; Rt+Ab2p = seed inoculation with 2 doses of *R. tropici* plus spraying of 2 doses of *A. brasilense*; Rt+Ab3p = inoculation of the seed with 2 doses of *R. tropici* plus spraying of 3 doses of *A. brasilense*. [2] Average of the municipalities of Goiás state: Itaberaí, Santo Antônio de Goiás and Cristalina. [3] Municipality of Goiás state: Goianésia. [4] Average of the municipalities of Minas Gerais state: Unaí and Paracatú.
Source: Research results, based on agronomic data of De Souza & De Brito Ferreira (2017).

CONCLUSIONS AND OUTLOOK

The best economic performance, measured by the benefit-cost-ratio, was obtained in treatment of inoculation of the seed with two doses of Rhizobium tropici plus spraying of three doses of Azospirillum brasilense.

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