

## ‘BRS GRAFITE’: BLACK BEAN CULTIVAR RECOMMENDED FOR THE WEST CENTRAL AND SOUTHEAST BRAZIL

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Common beans is an important source of protein for the Brazilian people, especially those of low income, with a “per capita” consumption of 13.6 kg and a total production of 2.37 million tons in the 2001/2002 year. These numbers rank Brazil as the largest producer and consumer of common beans in the world. There is regional preference as to the seed color, with the carioca type predominating over the country. Overall consumption of black beans reach 17%, mainly for the State of Rio de Janeiro and those of the South Region.

Black bean production has been below national needs, leading to 50-80 thousand tons of importation per year. The breeding program at the Embrapa Rice and Beans aims to develop evaluate and release improved cultivars with broad adaptation to the growing regions. The objective is to reach self sufficiency and finally reach amounts enough to export.

BRS Grafite is derived from the cross made at Embrapa Rice and Beans in 1986 between lines AN 5125867/Mexico 168. Bulk selection was utilized from F<sub>2</sub> to F<sub>4</sub> generations. Selection for resistance to the pathotype 89 of *Colletotrichum lindemuthianum* was done in F<sub>5</sub>. Remaining resistant plants were harvested individually to give rise to F<sub>6</sub> families. These families were evaluated for yield and upright plant architecture, resulting in the selection of line LM 95103904.

The above line, with 26 other breeding lines and three controls, was evaluated in a National trial in nine sites in the States of Goiás (2), Mato Grosso do Sul (2), Minas Gerais (1), Rio de Janeiro (1), Bahia (1), Espírito Santo (1), and Mato Grosso (1). LM 95103904 overcame all of the other lines and controls in the joint statistical analysis. The line was then evaluated in the field trial for cultivar release with eleven lines and two controls in eleven sites in the States of Goiás, Minas Gerais, Rio de Janeiro and Federal District (Table 1). It was released in 2003 with the trade name BRS Grafite, for cultivation in the Southeast and West Central regions of Brazil for the Autumn/Winter growing seasons, with irrigation.

**Table 1.** Yield of BRS Grafite, in Autumn /Winter growing seasons, compared to the mean of two control cultivars in 1999 and 2000.

Region	State	BRS Grafite (kg/ha)	Mean for controls (kg/ha)	Relative Yield (%)	Number of sites
Southeast	Rio de Janeiro	2251	2063	109	8
	Minas Gerais	3599	3323	108	4
Center West	Goiás/Federal District	2789	2831	99	7
Mean	-	2733	2586	106	-

<sup>1</sup>Controls: Diamante Negro and FT Nobre.

The BRS Grafite has uniform color and a mass of 25.2 g for 100 seeds. It has excellent cooking quality with 20 min cooking time and a chocolate brown color broth (Table 2).

**Table 2.** Technological and industrial quality of seeds from the cultivar BRS Grafite compared to other black bean cultivars.

Cultivar	Cooking time (minutes)	Soluble solids (%)	Broth Color <sup>1</sup>	Protein (%)	Fiber (%)	Tegument (%)
BRS Grafite	20,00	8,46	Light <sup>1</sup>	20,06	14,00	8,85
BRS Valente	28,10	10,91	Light <sup>1</sup>	19,25	9,70	11,75
FT Nobre	28,48	11,05	Light <sup>1</sup>	21,60		13,48
Rio Tibagi	36,00	12,40	Dark	20,00	12,50	13,10
Diamante Negro	34,02	11,20	Light <sup>1</sup>	20,00	10,00	11,40

<sup>1</sup>Chocolate brown.

The cultivar BRS Grafite showed resistant reaction to bean common mosaic virus strains (I gene) and to *C. lindemutianum* pathotypes 55, 89, 95 and 453. Under field conditions it showed resistance to rust, intermediate reaction to angular leaf spot and susceptibility to golden mosaic and common bacterial blight.

It has semi-upright plant architecture under the evaluated conditions of soil and climate. It has also good resistance to lodging, with a growing cycle of 90 days from emergency to physiological maturation.

BRS Grafite has been released for its high yield potential, excellent grain quality, upright growth habit, and resistance to some important diseases. The recommendation is for the States of Rio de Janeiro, Minas Gerais, Goiás and Federal District.

Genetic seed stocks are maintained by Embrapa Rice and Beans and basic seed is available at Embrapa Technology Transfer.

#### **Institutions of participating scientists:**

Embrapa Arroz e Feijão; Embrapa Milho e Sorgo; Embrapa Cerrados; Agenciarrural-GO; Pesagro - Empresa de Pesquisa Agropecuária do Rio de Janeiro; TecAgro - Tecnologia em Agricultura Ltda; Coagril - Cooperativa Agrícola Ltda.

#### **References**

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