

## GENOTYPES OF COMMON BEANS EXPORT TYPE EVALUATED IN BRAZIL

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Traditionally, the common beans most produced in Brazil are Carioca and Black bean types (Del Peloso et al., 2005); however other less consumed types with diverse colors and sizes such as Alubia, Cranberry, Dark Red Kidney, Light Red Kidney, Pinto and Navy are also produced with a great potential for export. At the moment the number of cultivar of those types is still insignificant, and breeding programs are very new if compared with Carioca and Black beans programs. The breeding program of the Embrapa Rice and Beans Research Center started to supply that demand, by identifying genotypes with suitable characteristics for the international market.

Eleven trials were conducted in 2009 and 2010 in the winter cropping season in the states of Goiás (three trials) and Minas Gerais (four trials); and in the wet and dry seasons in the state of Paraná (four trials). The experimental design was a completely randomized block with three replicates. Each trial was composed of 14 genotypes; among them 11 were promising (white, light red kidney, cranberry, dark red kidney and calima), and three controls (BRS Radiante, Hooter and Ouro Branco) (Table 1). These genotypes were selected based on evaluations performed previously by Pereira et al. (2010) and Del Peloso et al. (2010). The following evaluations were performed: lodging; plant architecture; disease resistance (common bacterial blight, anthracnose and oidium) using a scale ranking from 1 (phenotype totally favorable) to 9 (phenotype totally unfavorable); and 100 seed mass. Data collected in each experiment were submitted to individual and joint analysis. Scott Knott test at 10% was used for mean comparison.

The joint analysis detected significant differences ( $P < 0.01$ ) among genotypes, environments, as well as for genotype x ambient interaction. There was a good experimental precision with a coefficient of variation ( $CV = 16.6\%$ ). The general mean was  $1701 \text{ kg ha}^{-1}$  and a mean performance variation between  $1438 \text{ kg ha}^{-1}$  and  $2000 \text{ kg ha}^{-1}$ . The control cultivars BRS Radiante, with stripped seeds and commercially indicated for cropping in the states evaluated, and Ouro Branco, presented the best yield performance, together with genotypes CAL-96, Red Kanner and BRS Embaixador. Therefore, grain yield from these genotypes were similar to those of commercial varieties already being farmed.

The control Ouro Branco yielded the most among white seeded genotypes. Genotype Branco Graúdo was the best among the lines evaluated, but inferior to Ouro Branco in yield, plant architecture, lodging, M100, and reaction to CBC. Del Peloso et al. (2010) reported that these two genotypes showed similar M100. This line was superior to the control regarding anthracnose resistance. The other white seeded lines yielded less than Branco Graúdo. However line WAF 75 had the best plant architecture and the best resistance to lodging, besides yielding larger seeds, suggesting a good acceptance by consumers.

Among genotypes with other seed types, CAL-96 of calima type seeds and BRS Embaixador with DRK type seeds excelled, combining high yield, resistance to lodging and good plant architecture. BRS Executivo, seed type cranberry, yielded low. However it is important to point out that the comparison was performed with genotypes of other seed types. This genotype has the largest seeds among the evaluated, highly appreciated by the international market. Therefore, there are promising genotypes that may be recommended as new bean cultivars for the international market.

**Table 1.** Average yield (PROD) (kg ha<sup>-1</sup>); average<sup>(1)</sup> and maximum<sup>(2)</sup> grades for lodging (ACA), plant architecture (ARQ), bacterial blight (CBC), anthracnose (AN), and oidium (OI); and 100 seed mass (M100), of 14 genotypes of common beans evaluated in 11 environments in the States of Goiás, Minas Gerais and Paraná (Brazil), in 2009 and 2010.

Genotype	PROD		ACA <sup>(1)/(2)</sup>	ARQ	CBC	AN	OI	M100
BRS RADIANTE	2000	a	4.9/6	2.9/5	4.5/6	1.0/1	1.4/2	41.1
CAL-96	1902	a	3.9/6	2.3/4	5.0/6	1.0/1	6.8/8	53.0
RED KANNER	1874	a	5.4/8	3.3/5	5.0/5	1.0/1	7.0/8	45.2
OURO BRANCO	1846	a	3.7/8	2.3/5	4.5/5	5.5/9	6.6/8	48.5
BRS EMBAIXADOR	1841	a	3.1/7	2.4/5	2.5/3	1.0/1	6.4/8	47.2
HOOTER	1791	b	4.6/8	2.3/5	6.0/7	1.0/1	6.6/8	51.6
CHINOOK	1757	b	4.9/8	2.6/5	6.5/9	1.0/1	5.0/8	48.5
BRANCO GRAUDO	1702	b	4.7/8	2.7/5	7.0/8	1.0/1	6.2/8	44.6
LIGHT RED KIDNEY	1662	c	5.9/8	6.7/8	6.5/9	1.0/1	5.0/8	50.4
BRS EXECUTIVO	1542	d	5.3/8	6.4/8	2.0/2	2.5/4	1.6/3	58.3
MONTCALM	1503	d	5.4/7	2.6/5	5.5/6	1.0/1	6.4/9	49.1
WAF 141	1484	d	2.7/5	2.0/4	3.0/4	1.0/1	5.8/8	44.3
WAF 75	1478	d	1.9/3	1.7/4	5.5/7	1.0/1	5.6/8	56.5
WAF 170	1438	d	3.6/7	2.3/5	2.5/3	1.0/1	7.0/8	43.5

<sup>1</sup>Means followed by the same letter do not differ among them (Scott-Knott at 10% of probability).

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