COMMERCIAL QUALITY OF BLACK BEAN GENOTYPES

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The Brazilian black beans production is around 430,000 tons per year, corresponding to 20% of the total consumed by the Brazilian population (Del Peloso & Melo, 2005). It is the second largest consumed common bean type. Breeding programs are working to supply cultivars with improved agronomical characteristics, such as yield, disease resistance, and upright plant, among others. More recently other characteristics related to commercial quality that could contribute to increase the acceptance of a new cultivar are also being assessed such as market preference, and 100 seed mass; therefore, the objective of this work was to assess the commercial quality of common black bean lines.

In 2009 trials were carried out in eight environments in the states of Goias (dry and winter seasons) and Paraná (dry season). The environments were Ponta Grossa/dry season; Araucária/dry season; Prudentópolis/dry season; Inhumas/dry season; Santo Antônio de Goiás/winter season; Urutaí/winter season; Anápolis/winter season and Senador Canedo/winter season. The experimental design was a completely randomized block design arranged in plots with four rows four meters long and three replicates. Each trial consisted of 14 bean genotypes, commercial group black (Table 1). Data for yield were collected in the two central rows, and 300 g samples were drawn from each plot and passed through a 2.25 mm sieve. Seeds kept in the sieve were weighed to obtain the percentage of standard commercial beans – PGPC. A sample was also drawn to obtain 100 seed mass. Data from the three characteristics studied were subjected to the analysis of variance followed by joint analysis. Scott Knott test at 10% was used for mean comparison.

A high experimental precision was obtained with CV varying from 16% to 9% and 4% for yield, percentage of marketable beans and 100 seed weight, respectively. The mean separation test was used to assign the genotypes in two groups with small variability among them (Table 1). Genotypes yielding best were: CNFP 11984, BRS Esplendor, CNFP 11985, CNFP 11979, CNFP 11995, IPR Uirapuru, CNFP 11973 and CNFP 11978, with similar average yield and superior to the two controls (BRS 7762 Supremo and BRS Campeiro).

Significant differences were observed (P < 0.01) for percent commercial standard beans, among genotypes, among environment and for genotype x environment interaction, evidencing great variability for that trait, also observed in the mean test that divided the genotypes in six groups. Beans kept in the sieve averages varied from 56.3 to 88.3, and genotype yielding higher was CNFP 11995, with 88.5% of sieve retention, higher than all controls (Table 1). Widely cropped cultivar IPR Uirapuru had the second highest average (74.3%). Significant differences were also detected (P < 0.01) for 100 seed mass among genotype, environments and genotype x environment interaction. Mean comparison test divided genotypes in seven groups (Table 1). Genotypes with the highest 100 seed mass were BRS Campeiro, CNFP 11985 and CNFP 11976 with an average 25g/100 seeds. Genotype CNFP 11983 with 19.9g/100 seed weight ranked lower (5g) than the best performers, indicating a great variability for that trait.

The best performing genotype for all traits evaluated was CNFP 11995 line, with a bean yield of 2,157 kg ha^{-1}; the highest sieve retention average, and the highest 100 bean mass; superior to all controls in the general analysis for all three traits tested; becoming a promising breeding line.

Table 1. Means yield (PROD) (kg ha^{-1}), percent of commercial standard beans (PGPC) and 100 seed mass (M100) of 14 common Black bean genotypes evaluated in eight environments in the states of Goiás and Paraná, Brazil in 2009.

GENOTYPE	PROD	PGPC	M100
CNFP 11984	2263 a	65.3 d	21.5 f
BRS Esplendor	2202 a	56.3 f	21.0 f
CNFP 11985	2200 a	61.5 e	22.6 d
CNFP 11979	2161 a	57.9 f	24.3 b
CNFP 11995	2157 a	88.3 a	25.1 a
IPR Uirapuru	2105 a	74.3 b	23.4 c
CNFP 11973	2096 a	67.3 d	23.6 c
CNFP 11978	2088 a	65.2 d	23.4 c
BRS 7762 Supremo	2054 b	70.3 c	22.8 d
CNFP 11983	2026 b	60.8 e	19.9 g
CNFP 11994	2011 b	70.1 c	23.1 d
CNFP 11991	1920 b	64.0 d	22.2 e
BRS Campeiro	1912 b	62.6 e	25.3 a
CNFP 11976	1906 b	64.5 d	25.0 a
AVERAGE	2079	66.3	23.1

[1]Means followed by the same letter do not differ among themselves (Scott Knott at 10% of probability).

REFERENCE

DEL PELOSO, M.J. and MELO, L.C. Potencial de rendimento da cultura do feijoeiro-comum. Santo Antônio de Goiás: Embrapa Arroz e Feijão, 2005. 131p.