COMMERCIAL QUALITY OF CARIOCA COMMON BEAN GENOTYPES

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Among the many grain types of beans cultivated in Brazil, commercial type "carioca" stands out as the most consumed, representing 70% of the Brazilian dry beans market (Del Peloso & Melo, 2005). Breeding programs have been releasing new cultivars with improved characteristics, contributing to yield increases. Besides agronomic traits, other characteristics for consumer acceptance such as those related to commercial quality like 100 seed weight and grain size are of great importance. Cultivar Pérola meets those parameters, becoming a standard in the Brazilian dry beans market. During trials of new genotypes it is important to evaluate commercial characteristics, by comparing with the standards adopted, aiming to increase the chance of acceptance of new released cultivars. The objective of this work was to evaluate the quality of "carioca" commercial bean genotypes.

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 meter rows with three replicates. Each trial consisted of 16 bean genotypes, commercial group carioca (Table 1). Data for bean yield were collected in the two central rows, and 300 g samples were drawn from each parcel and passed through a 2.25 mm sieve. Seeds kept in the sieve were weighed to obtain the percentage of standard commercial grains in each sample – PGPC. A sample was also drawn to obtain 100 seed mass. Yield, PGPC and 100 seed mass data were subjected to the analysis of variance followed by the trials joint analysis and the Scott Knott test at 10% was used for means comparison.

The joint analysis for yield presented good precision (CV=18%) and significant differences (P<0, 01) among genotypes, environment and genotype x environment interaction were detected. Two eight genotype groups were formed by the mean test (Table 1). Genotypes Pérola, IPR Juriti, CNFC 11946, CNFC 11948, CNFC 11951, CNFC 11954, CNFC 11959 and CNFC 11966 yielded most. Regarding PGPC, the joint analysis also detected significant differences (P<0.01) among genotypes, environments and genotype x environment interaction. Environments average varied from 50% to 88% with a low 7% CV, evidencing a great variability among genotypes for that characteristic. Nine genotypes had average equal or higher than cultivar Perola, used as standard. Among those, genotypes BRS 9435 Cometa, CNFC 11948, BRS Estilo, CNFC 11946, CNFC 11962, CNFC 11944 and CNFC 11945 performed better than Pérola. The joint analysis for 100 seed mass also detected significant differences (P<0.01) among genotypes, environments and genotype x environment interaction. CV was low (4%) and genotypes average varied from 21.7 to 27.4, corroborating the existence of a great variability. Environments average varied from 23.6 to 26.7, corroborating the importance of the environment on the expression of those characteristics. Cultivar Pérola average was 27.2 and any genotype surpassed this value. CNF 11948 average was statically identical to Pérola, and four genotypes had 100 seed mass lower (above 25.6).

Among the outstanding lines, CNF 11948 and CNF 11946 presented high PGPC (85.6 and 85.5), yielding high commercial value beans. Besides, CNFC 11948 had an acceptable 100 seed mass (27.4), similar to Pérola (27.2) and line CNF 11946 had a 100 seed mass, a little lower than Pérola (25.6).

Table 1. Average yield (PROD) (kg ha^{-1}), percentage of commercial standard beans (PGPC) and 100 bean mass (M100) of 16 common bean carioca type genotypes, evaluated in eight environments in the states of Goiás and Paraná (Brazil), in 2009.

GENOTYPES	YIELD	PGPC	M100
CNFC 11954	2338 a	77.9 c	24.2 d
CNFC 11959	2208 a	78.5 c	22.0 e
CNFC 11966	2179 a	60.6 e	24.8 c
CNFC 11948	2133 a	85.6 b	27.4 a
PEROLA	2117 a	80.1 c	27.2 a
IPR JURITI	2074 a	68.8 d	24.3 d
CNFC 11951	2057 a	55.6 f	25.8 b
CNFC 11946	2039 a	85.5 b	25.6 b
BRS ESTILO	1948 b	85.5 b	26.0 b
CNFC 11962	1945 b	84.7 b	21.7 e
BRS 9435 COMETA	1915 b	90.3 a	24.5 c
CNFC 11952	1885 b	49.4 g	26.0 b
CNFC 11956	1883 b	46.6 h	23.9 d
CNFC 11953	1802 b	39.2 i	25.1 c
CNFC 11945	1797 b	84.0 b	24.7 c
CNFC 11944	1797 b	84.3 b	25.1 c
MÉDIA	2007	72.3	24.8

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

REFERENCES

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