

EVALUATION OF IRRIGATED BEAN LINES IN THE REGION OF PORANGATU-GO

Guimarães, C.M. *, del Peloso, M.J., Pereira, H.S. and Melo, L.C.

Embrapa Arroz e Feijão, CP 179, CEP 75375-000, Santo Antônio de Goiás, GO
Fone +55 62 3533-2178, Fax +55 62 3533-2100. *E-mail: cleber@cnpaf.embrapa.br

INTRODUCTION

The common bean (*Phaseolus vulgaris* L.) is one of the main food of the Brazilian peoples diet. It is grown in almost all country and in different growing seasons, and therefore has extensive soil and climate adaptation (Buratto et al., 2007). This is due to its genetic diversity. Ramalho et al. (1993) added that the study of genotype x environment interaction, where different environmental conditions occur, takes role in the process of new cultivars recommendation, and it is necessary to minimize this effect through the selection of cultivars with greater phenotypic stability. Therefore, the objective of this study was to evaluate inbred lines of carioca and black grain types common bean of the Embrapa breeding program under irrigated conditions and in the region of Porangatu-GO.

MATERIALS AND METHODS

Two irrigated experiments, Ψ_s of -0.035 MPa at 15 cm depth, were conducted, one in 2007 and another in 2008 at the Experimental Station of SEAGRO, Porangatu-GO, located at $13^\circ 18' 31''$ South and $49^\circ 06' 47''$ West, with an altitude of 391 m, Aw climate, tropical savanna, megathermic, in an Oxisol. Sowing was done in 08/06/2007 and 13/06/2008, in plots of four rows with five meters in length each. The seeding rate was 15-18 seeds per meter. The experimental design was a randomized block with three replications. We evaluated the yield, in kg ha^{-1} , at the two years and the flowering date in days after sowing (DAS) in 2008 only, of the 14 black grain type lines, and 17 of the carioca grain type lines.

RESULTS AND DISCUSSION

Results showed that bean lines of grain types, black and carioca, produced significantly different yield in the two years of experimentations. The black grain type lines produced, 986 kg ha^{-1} and 1858 kg ha^{-1} in 2007 and 2008, respectively. While carioca grain type lines produced 1764 kg ha^{-1} and 2268 kg ha^{-1} , respectively. It was also observed that the lines of grain types, black and carioca, produced significantly different grain yield from each other. Additionally, it was found that the effect of years was different on the black grain type lines, since the lines x years interaction was significant. The same was not observed in the carioca grain type lines. Flowering date was evaluated only in experiments conducted in 2008 and it was observed that the lines flowering date of grain types, black and carioca, differed significantly among each other (Table 1). The more productive lines of black grain type in 2007 were: BRS Supremo, CNFP 10214 and CNFP 10806, which yielded 1350 kg ha^{-1} , 1350 kg ha^{-1} and 1356 kg ha^{-1} , respectively. Two other lines, CNFP 10800 and CNFP 10807, produced grain yield of 1081 kg ha^{-1} and 1047 kg ha^{-1} , respectively. These lines did not differ significantly from previous lines, however presented yields not differed from the second group which was more productive. The line CNFP 10221, with only 650 kg ha^{-1} was the least productive in 2007. However not differ significantly from the lines BRS Valente, IPR Uirapuru, CNFP 10025,

CNFP 10793, CNFP 10794 and CNFP 10805. The lines in 2008 were more productive and also differed significantly among each other. The most productive group of the black grain type lines was composed by the BRS Valente, BRS Grafite, BRS Supremo, IPR Uirapuru, CNFP 10214, CNFP 10793, CNFP 10794, CNFP 10800, CNFP 10805, CNFP 10806 and CNFP 10807, which produced 1756 kg ha⁻¹ to 2352 kg ha⁻¹ grain yield. They flowered from 43 to 49 DAS. Of these, only line BRS Supremo, CNFP 10214, CNFP 10800, CNFP 10806 and CNFP 10807 participated in the most productive group in the two years of experimentation. The line CNFP 10221, with 1289 kg ha⁻¹ and flowering at 47 DAS, followed the pattern of 2007 by failing to present good yield performance.

Table 1. Summary of the analysis of variance for yield in 2007 and 2008, and for flowering date, in 2008, for the black and carioca grain types of bean lines.

Source of variation	D.F.	Mean square error	
		Yield (kg ha ⁻¹)	Flowering Time (DAS)
Black grain type bean			
Year (Y)	1	15 977 657.44**	
Error (a)	4	249 238.94	
Lines (L)	13	258 080.03**	8.07**
Y x L	13	162 641.36**	
Error (b)	52	75 410.58	2.22
CV (%)		19.31	3.26
Carioca grain type bean			
Year (Y)	1	6 474 888.24**	
Error (a)	4	14 922.19	
Lines (L)	16	503 112.07**	7.25*
Y x L	16	217 797.56 ^{ns}	
Error (b)	64	136 474.97	3.11
CV (%)		18.32	3.81

ns-F not significant at 5%,*-F significant at 5% e **-F significant at 1%.¹DAS–days after sowing

The effect of years did not affect the productive performance of carioca grain type bean lines therefore it was discussed the productivity average of the lines in the two years of experimentation. It was found that the lines CNFC 10721, CNFC 10729, IPR Juriti, CNFC 10762, CNFC 10716, CNFC 10758, CNFC 10753, CNFC 10733, CNFC 10703, CNFC 10757 and BRS Pontal do not differ significantly in terms of productivity and classified into more productive group. They also presented similar flowering behavior, 46-47 DAS. These lines produced on an average of 1944 kg ha⁻¹ to 2443 kg ha⁻¹ during the two years of experimentation.

CONCLUSION

The black and carioca grain types lines differed significantly when grown under irrigated conditions of Porangatu-GO, region. The most productive lines in the two years experiments were BRS Supremo, CNFP 10214, CNFP 10800, CNFP 10806 and CNFP 10807 of the black grain type, and CNFC 10721, CNFC 10729, IPR Juriti, CNFC 10762, CNFC 10716, CNFC 10758, CNFC 10753, CNFC 10733, CNFC 10703, CNFC 10757 and BRS Pontal of the carioca grain type.

REFERENCES

- Buratto, J.S.; Moda-Cirino, V.; Fonseca, Jr,N.S.; Prete, C.E.C.; Faria, R.T. Adaptabilidade e estabilidade produtiva em genótipos precoces de feijão do estado do Paraná. *Semina. Ciências Agrárias*, v. 28, p. 373-380, 2007.
- Ramalho, M.A.P.; Santos, J.B. dos; Zimmermann, M.S. de O. Interação dos genótipos x ambientes. In: Ramalho, M.A.P.; Santos, J.B. dos; Zimmermann, N.S. de O. *Genética quantitativa em plantas autógamas: aplicação no melhoramento do feijoeiro*. Goiânia: Editora UFG, 1993. p.131-169. (Publicação, 120).