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BRS Cometa: a carioca common bean cultivar with erect growth habit

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ABSTRACT - *BRS Cometa* was developed by Embrapa Rice and Beans and registered by the Ministério da Agricultura, Pecuária e Abastecimento (MAPA) for the states of Santa Catarina, São Paulo, Tocantins, Goiás and the Federal District of Brazil in view of its erect growth habit, earliness, good lodging resistance and resistance to *Colletotrichum lindemuthianum* and to bean common mosaic virus.

Key words: *Phaseolus vulgaris*, plant breeding, cultivar description.

INTRODUCTION

Common bean is considered the basic protein source of Brazilian citizens. Besides the culinary quality standards, there are regional preferences in terms of grain color and type. Presently, the dry bean consumption per capita is about 79% carioca, 17% black and 4% other grain types. This amount of beans is produced mostly in the Southern, Southeast and Center-west regions. To meet the demand, the bean production in 2006 amounted to about 3.0 million of tons cultivated in an area of 2.9 million hectares, totaling an average national productivity of 1034 kg ha⁻¹. If on one side the productivity is on the rise, the consumption per capita has been declining, resulting in an estimated average annual consumption of 12.7 kg inhabitant⁻¹, in 2006. The bean breeding program of Embrapa Rice and Beans is focused on more productive, disease-resistant and erect plant type cultivars. The latter characteristic favors mechanical bean harvesting, which enables farmers to offer consumers a superior quality product.

CULTIVAR ORIGIN AND DEVELOPMENT

BRS Cometa is originated from the cross A 769 /// / EMP 250 /// A 429 / XAN 252 // C 8025 / G 4449 /// WAF 2 / A 55 // GN 31 / XAN 170, performed at Centro Internacional de Agricultura Tropical (CIAT), Colombia. In 1994, Embrapa Rice and Beans received the F_{1:3} families from CIAT. From F₃ to F₅, plants were selected by the bulk method based on the carioca grain type, erect plant type and resistance to angular leaf spot, rust and anthracnose. In F₆, individual plants were selected based on yield, adaptation, erect plant type, resistance to common bacterial blight and carioca grain type. In F₇, line LM 98202147 was selected based on yield and plant type.

PERFORMANCE

In 1999 and 2001 the line was tested in the Carioca Preliminary Trials and in the National Trial, respectively, in seven different environments in the states of Goiás

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(1), Minas Gerais (2), Rio de Janeiro (1), Sergipe (1), Paraná (1) and the Federal District (1). Based on the results obtained by the joint yield analyses and other cultural characteristics, line LM 98202147 was evaluated in 2003 and 2004 with 11 other lines and 4 controls, in VCU (Value for Cultivation and Use) trials, under the provisional name CNFC 9435, in 77 different environments in the states of Goiás (24), Tocantins (7), Mato Grosso (4), Mato Grosso do Sul (4), Sergipe (6), Alagoas (1), Bahia (1), São Paulo (6), Paraná (10), Santa Catarina (10), and Federal District (4). In the 77 VCU trials carried out in 2003 and 2004, the yield of cultivar BRS Cometa was similar to that of Iapar 81 and Carioca Pitoco (Table 1).

OTHER CHARACTERISTICS

Technological and industrial grain quality

The color and grain size of BRS Cometa was uniform, 100 seeds weighed 24.6g and the cooking time was 33 minutes (Table 2).

Disease reaction

Under artificial inoculation BRS Cometa was resistant to bean common mosaic virus and to pathotypes 55, 95 and 453 of *Colletotrichum lindemutianum*. In the field it was susceptible to angular leaf spot and bean golden mosaic virus and the reaction to rust and common bacterial blight was moderate (Table 3).

Plant type, lodging resistance and cycle

The plant type of BRS Cometa is erect with good

lodging resistance and the crop cycle lasts 80 days from emergence to harvest (Table 3).

CONCLUSIONS

Due to its erect plant type, disease and lodging resistance, the cultivar BRS Cometa was indexed by MAPA as suitable for production in the wet season in the states of Santa Catarina of São Paulo, in the winter season in Tocantins and in the wet and winter seasons in Goiás and Federal District.

SEED PRODUCTION

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

PARTNER INSTITUTIONS IN THE CULTIVAR EVALUATION

Embrapa Cerrados-DF; Embrapa Soja-PR; Embrapa Agropecuária Oeste-MS; Empresa de Pesquisa Agropecuária e Extensão Rural de Mato Grosso-MT; Embrapa Tabuleiros Costeiros-SE; Embrapa Negócios Tecnológicos-PR; Agência Goiana de Desenvolvimento Rural e Fundiário-GO; Fundação de Ensino Superior de Rio Verde-GO; Centro Federal de Educação Tecnológica (GO); Avena S/C Ltda. - Major Vieira-SC; Cooperativa Regional Agropecuária de Campos Novos (SC); C. Vale Cooperativa Agroindustrial-SC; Escola Agrotécnica Federal de Concórdia-SC; Cooperativa dos Produtores de Sementes de Laranjeiras do Sul Ltda-PR; Sementes

Table 1. Grain yield of BRS Cometa according to the region/state and compared to the control mean in VCU Trials, in 2003 and 2004

Region	State	Season	BRS Cometa (kg ha ⁻¹)	Control ¹ (kg ha ⁻¹)	Relative yield (%)	Environment
South	SC	“wet”	2458	2772	88.9	7
Southeast	SP	“wet”	2749	3074	89.1	6
Center-west	GO/DF	“wet”	2061	2042	107.4	12
		“winter”	2304	2546	90.2	12
North	TO	“winter”	1717	2118	88.6	6
Mean			2258	2510	90.0	

¹Iapar 81 and Carioca Pitoco

Table 2. Bean quality test of cultivar BRS Cometa compared to both controls

Cultivar	Cooking time (min.)	Protein (%)	100-seed weight (g)
BRS Cometa	33	22.2	24.6
Carioca Pitoco ¹	36	-	20.4
Iapar 81 ¹	29	22.5	25.1

¹Iapar 81 and Carioca Pitoco

Table 3. Mean grades* of BRS Cometa cultivar and controls¹ for anthracnose reaction, plant type, lodging resistant and cycle

Cultivar	Anthracnose reaction	Plant type	Resistant to lodging	Cycle (days)
BRS Cometa	1.0	3.8	4.1	80
Carioca Pitoco ¹	8.2	6.3	7.2	75
Iapar 81 ¹	4.5	4.2	5.4	92

*Grades: scale from 1 to 9, where 1 corresponds to a desirable phenotype and 9 to undesirable ones

Campo Verde-PR; Universidade Estadual de Londrina-PR; Cooperativa Agrícola Mista de Prudentópolis-PR; Detec Assessoria Técnica S/C Ltda-SP; Anastácio Ceregatti Sanchez Ltda-SP; Cooperativa Regional Agropecuária de Taquarituba-SP; Empresa Baiana de Desenvolvimento Agrícola-BA.

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