



CULTIVAR RELEASE

BRSMG União: common bean cultivar with jalo grain for the state of Minas Gerais

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Abstract – *The bean cultivar BRSMG União as a new option of a bean cultivar with jalo grains for the state of Minas Gerais. The cultivar BRSMG União had an average grain yield of 9.8% above the mean of the controls (Jalo EEP 558 and BRS Radiante) and was resistant to powdery-mildew.*

Key words: *Plant breeding, Phaseolus vulgaris L.*

INTRODUCTION

For common bean cultivars with so-called jalo (large and yellow) grains, grown and sold in certain regions of the state of Minas Gerais, market prices are generally the best. However, most cultivars with this grain type have some problems in terms of pathogen susceptibility, particularly to *Erysiphe poligoni*, the causal agent of powdery mildew (Paula Júnior and Zambolin 2006). Although this disease is not one of the most important of common bean in Brazil, it can cause significant yield losses, depending on the variety, as in the case of ‘Jalo EEP 558’.

Since few cultivars with jalo grain are available for planting, the institutions that work with common bean breeding in Minas Gerais (Federal University of Lavras - UFLA and of Viçosa -UFV), Agricultural Research Corporation of Minas Gerais (Epamig) and Brazilian Agricultural Research

Corporation (Embrapa), joined efforts in the evaluation of lines with this type of grain with a view to obtain and recommend options of new cultivars that are superior to ‘Jalo EEP 558’, which had been indicated for Minas Gerais in 1980 (Ramalho and Abreu 2006). As a result of this cooperation, ‘BRSMG União’ can now be recommended as a new option of a common bean cultivar with jalo grains for Minas Gerais.

BREEDING METHODS

The cultivar BRSMG União was originated by the cross between the cultivars Jalo EEP 558 and ESAL 686. After hybridization and to obtain the F₁ generation, ‘Jalo EEP 558’ was backcrossed. The F₁BC₁ seeds were sown in an experimental area of the Department of Biology of UFLA and 64 F_{1;2}BC₁ progenies were selected. The seeds of these

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progenies were planted again for the $F_{1.3}BC_1$ generation, which was evaluated in experiments with replications and 33 progenies were selected specifically for resistance to powdery mildew (*E. poligoni*) and for jalo grain traits.

The 33 $F_{1.4}BC_1$ progenies were evaluated in the same experimental area, together with the parents Jalo EEP 558 and ESAL 686 and cultivar Pérola as control. The severity of powdery mildew was assessed on a 1-9 rating scale, from 1 (0% of infection) to 9 (80-100% of infected leaf area) and yield in $kg\ ha^{-1}$. The yield of eighty-four percent of the progenies was better than of cultivar Jalo EEP 558, and among these, one line also stood out with the characteristic grain type of the trade group jalo, aside from the good resistance to powdery mildew.

From the dry season of 2005 until rainy season 2006/2007, this line was evaluated in tests to determine the Value for Cultivation and Use (VCU), together with over 21 other lines and the controls 'BRS Radiante' and

'Jalo EEP 558'. The experiments were conducted by the partnership institutions in environments in the state of Minas Gerais (Table 1), using a randomized complete block design with three replications and plots consisting of four 4-m rows.

CULTIVAR CHARACTERISTICS

Plant height and lodging resistance

Cultivar BRSMG União has an indeterminate, type III growth habit. In the evaluations of plant architecture and lodging tolerance on a rating scale, its performance was similar to the control 'Jalo EEP 558' (Table 2).

Disease response

In the field evaluations, 'BRSMG União' was tolerant and/or resistant to natural infestation by some pathogens (*Fusarium* wilt, powdery mildew, rust, and angular leaf spot), with a particularly good resistance to powdery mildew, a

Table 1. Mean grain yield ($kg\ ha^{-1}$) of the cultivar BRSMG União and controls ('BRS Radiante' and 'Jalo EEP 558') per location, season and year of assessment in the state of Minas Gerais

Location	Growing season	Year	BRSMG União	Controls		% of the Control mean
				Radiante	Jalo	
Lavras	Dry	2005	2575	2058	2242	119.8
Lambari	Dry	2005	2283	1142	1087	204.8
Patos de Minas	Dry	2005	2145	2433	2012	96.5
Viçosa	Dry	2005	2800	2695	2613	105.5
Ponte Nova	Dry	2005	1399	1061	1367	115.2
Ijaci	Winter	2005	2454	2531	2354	100.5
Patos de Minas	Winter	2005	1154	1425	1023	94.3
Ibiá	Winter	2005	2479	2215	2099	114.9
Sete Lagoas	Winter	2005	3183	3008	2150	123.4
Ijaci	Rainy	2005	2352	1938	2317	110.6
Lavras	Rainy	2005	1523	1823	1158	102.2
Lambari	Rainy	2005	1821	1533	1346	126.5
Patos de Minas	Rainy	2005	3075	2450	2604	121.7
Lavras	Dry	2006	2512	2323	2144	112.5
Lambari	Dry	2006	3092	3083	3379	95.7
Patos de Minas	Dry	2006	2104	2129	2062	100.4
Viçosa	Dry	2006	2908	3033	2547	104.2
Coimbra	Dry	2006	1875	1692	1638	112.6
Lambari	Winter	2006	2554	1820	2196	127.2
Patos de Minas	Winter	2006	1923	1660	1190	134.9
Uberlândia	Winter	2006	1155	1568	2112	62.8
Coimbra	Winter	2006	2683	2145	2073	127.2
Sete Lagoas	Winter	2006	2692	2967	3075	89.1
Lavras	Rainy	2006	1712	1483	1858	102.5
Patos de Minas	Rainy	2006	1921	2292	2017	89.2
Viçosa	Rainy	2006	1899	1056	1948	126.4
Mean rainy seasons			2043	1796	1893	110.8
Mean dry seasons			2369	2165	2109	110.9
Mean winter			2253	2149	2030	107.8
General mean			2241	2060	2024	109.8

Table 2. Some traits of the cultivar BRSMG União and control 'Jalo EEP 558', obtained in experiments conducted in the State of Minas Gerais in 2005 and 2006

Trait	BRSMG União	Jalo EEP 558
Growth type ¹	5.8	6.2
Lodging ²	5.3	5.9
Days until flowering	35	34
Days until maturity	77	82
Powdery mildew ³	2.8	6.8
Rust ³	1.5	1.0
Angular leaf spot ³	2.0	1.1

¹ 1-9 scale, from 1 - upright plants to 9 - prostrate plants; ² 1-9 scale, from 1 - no lodging to 9 - all plants lodged; ³ 1-9 scale of disease severity, from 1 - resistance to 9 - susceptibility.

disease to which the control 'Jalo EEP 558' is highly susceptible (Table 2). Under artificial inoculation, 'BRSMG União' was susceptible to curtobacterium wilt, moderately resistant to common bacterial blight and resistant to the pathotype 475 of the fungus *Colletotrichum lindemuthianum*, causal agent of anthracnose.

Crop cycle

The flowering of 'BRSMG União' occurs when the plants are on average 35 days old and the crop cycle is completed within around 77 days, thus representing a semi-early cultivar.

Yield

The average grain yield of 'BRSMG União' was higher than of the controls in most evaluation environments (Table 1). It also performed better than the controls when considering the mean of the locations in the state in each growing season and the mean of all sites and seasons (9.8%).

Industrial and technical grain quality

Cultivar BRSMG União has evenly cream-colored grains, similar to 'Jalo EEP 558', with an average 100-seed weight

of 39.6g. The culinary quality is excellent (23.8% protein) and the cooking time 29 minutes, comparable to most bean cultivars recommended nowadays.

BASIC SEED PRODUCTION

Cultivar BRSMG União was registered by Embrapa, EPAMIG, UFLA, and UFV in the National Register of Cultivars (RNC) of the Brazilian Ministry of Agriculture, Livestock and Supply (MAPA) on Feb 8, 2011, under number 27606, and the request for protection is being analyzed by the National Plant Varieties Protection Service (SNPC). EPAMIG is in charge of the seed production.

PARTNER INSTITUTIONS IN THE EVALUATION OF THE CULTIVAR

Embrapa Arroz e Feijão, Universidade Federal de Lavras, Universidade Federal de Viçosa, Empresa de Pesquisa Agropecuária de Minas Gerais, Embrapa Milho e Sorgo, Universidade Federal de Uberlândia and Coopertinga

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