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CULTIVAR RELEASE
BRS Guabiju – Wheat cultivar

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ABSTRACT - *Wheat cultivar 'BRS Guabiju' was developed by Embrapa. It resulted from a cross of BR 23 and PF 86743. 'BRS Guabiju' has high gluten strength and is stable for this trait in different environments of evaluation.*

Key words: *Triticum aestivum*, germplasm, crop breeding.

INTRODUCTION

The genetic improvement program for wheat of the Embrapa has the objective to offer the production chain competitive cultivars of the cereal from an agronomic point of view and appropriate for different segments of the milling industry in respect of quality and use. BRS Guabiju is a cultivar that was launched in partnership with the Fundação Pró-Sementes de Apoio a Pesquisa which takes part in the process of experimentation marketing and distribution of material of the Embrapa. 'BRS Guabiju' stands out for its grain quality with superior gluten strength appropriate for baking.

PEDIGREE AND IMPROVEMENT METHOD

'BRS Guabiju' is derived from a crossing of line PF 86743 with cultivar BR 23 realized at the Embrapa Wheat in summer 1990/91. The complete pedigree of this crossing is shown in Figure 1. The F_1 generation was conducted in green house in the county of Passo Fundo in the winter of 1991 and one selected plant originated seeds of the F_2 population. Also in Passo Fundo selection was realized in the populations F_2 to F_9 in the winter plant growing seasons of 1992 to 1997 under cover and on the field using the genealogic selection method with selection among and within populations. Populations and plants that did not present dark red vitreous grains an indicator of baking quality were eliminated in the visual selection after threshing. The F_6 generation was subjected to selection for wheat leaf rust resistance. Resistance of adult plants (RPA) was detected in this genotype. Leaf spots and scab were also considered in the selection of the material. In 1997 a seed sample of F_9 generation was sown on the experimental area of Embrapa Wheat to obtain advanced lines. The plot presented uniformity and was harvested and designated line PF 970141. In 1998 and in 1999 line PF 970141 was evaluated in internal preliminary trials for grain yield and was included in trials to determine the Value of Cultivation and Use (VCU) in the following years. 'BRS Guabiju' was indexed for cultivation in 2004 for the state of Rio Grande do Sul and Santa Catarina (Commission 2004) and was extended to the states Paraná and Mato Grosso do Sul in 2005 (Commission 2005).

PERFORMANCE

The performance data of cultivar BRS Guabiju regarding grain yield used for its indexation are shown in Table 1. The cultivar was tested in 29 different environments in the states of the Rio Grande of the Sul Santa Catarina Paraná São Paulo and Mato Grosso do Sul. In the general mean of all sites BRS Guabiju presented a grain yield of 2892 kg ha^{-1} with 4% of superiority in relation to control means. In 17 environments the cultivar outmatched the controls in the years 2001 and 2002. A very high yield potential is not a characteristic of BRS Guabiju; nevertheless it presented satisfactory results. In both years of evaluation the highest yields were 4213 kg ha^{-1} in Guarapuava (2002) and 4779 kg ha^{-1} in Vacaria (2002). With exception of the environment Paraguaçú Paulista in 2002 which presented a coefficient of variation (CV) of 20% all other trials had a low CV (Table 1). Table 2 shows the means of cultivar BRS Guabiju in the years of 2003 and 2004 used for its extension of cultivation to the states of Paraná and Mato Grosso do Sul. In Paraná considering the mean of the years of evaluation the cultivar did practically not differ from the control means with 99.7% of its grain yield. In the state of the Mato Grosso do Sul however it outclassed the control means by 3.5%. In these trials it achieved a maximum yield of over 5 tons ha^{-1}. For each state distinct sets of controls were taken into consideration according to the area of cultivation and importance for the production chain of the cereal.

OTHER CHARACTERISTICS

'BRS Guabiju' belongs to the bioclimatic group of spring wheat. Its vegetative cycle is in the mean 83 days while the total cycle lasts around 136 days in RS. The cycle can vary according to climatic and regional cultivation conditions. It presents moderate resistance to lodging to shattering and to 'crestamento' (soil acidity). It is moderately susceptible to natural germination of the ear so attention must be paid in the harvest period. There is so far no consistent information in relation to the performance under frost during the vegetative cycle. 'BRS Guabiju' has a mean height of 95 cm which can restrict the use of nitrogen in the plantations; the highest recommended dose is 60 kg nitrogen ha^{-1}. The use of growth reducers at the time and quantity indicated by research could be an effective alternative to raise the production potential without qualitative loss through lodging mainly through grain weight reduction. Cultivar BRS Guabiju reacts well to the main wheat diseases. It is moderately resistant to leaf rust (*Puccinia. triticina)* to powdery mildew (*Blumeria* graminis f. sp. *tritici*) to wheat mosaic virus and septoria glume blotch (S*tagonospora nodorum*) but presents susceptibility to scab (*Fusarium graminearum*). So far there is no consistent information in relation to the other diseases. BRS Guabiju presents an erect flag leaf with predominantly colorless auricles. The ears are fusiform and awned. In relation to the alveograph test (W) which defines the qualitative suitability of the cultivar BRS Guabiju is classified as wheat of the bread class in Rio Grande of the Sul and Santa Catarina (W mean = 276 10^{-4}J) and extra strong wheat class in the states Paraná and Mato Grosso do Sul (W mean = 304 10^{-4}J). The ratio dough tenacity/ extensibility (P/L) observed in the years of evaluation was 0.78 varying from 0.45 to 1.29. The glutenins present the bands n 2+12 and 7+9. The falling number of the cultivar is 359 seconds in the mean. The grain is oblong red semi-flint has a mean weight of a thousand grains of 31.65 g and a mean hectoliter weight of 77.47 kg hl^{-1} (means of years of evaluation in VCU trial).

SEED MAINTENANCE AND DISTRIBUTION

'BRS Guabiju' is indexed by the Ministério da Agricultura Pecuária e Abastecimento-MAPA (Ministry of Agriculture Animal Husbandry and Supply) under number 17656. Embrapa Wheat is in charge of the genetic seed the Serviço Nacional de Tecnologia da Embrapa (SNT) is responsible for basic seed and the Instituidores da Fundação Pró-Sementes de Apoio a Pesquisa in partnership with the Embrapa for certified seed of cultivar BRS Guabiju.

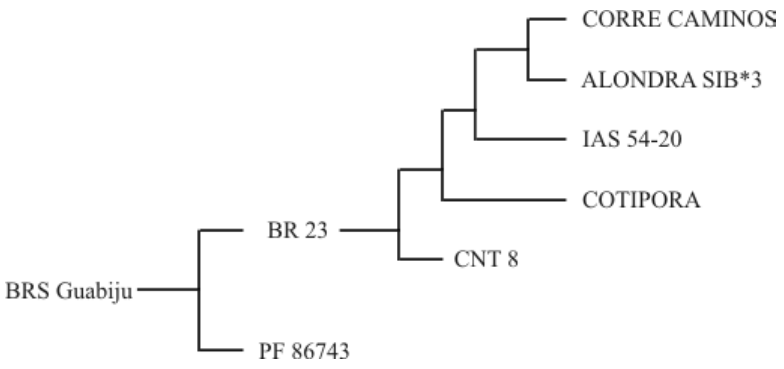

Figure 1. Pedigree of 'BRS Guabiju'

Table 1. Grain yield means of the years when cultivar BRS Guabiju participated in the VCU (Value for Cultivation and Use) trial aiming at indexation in the different environments of evaluation

State	Local	Year	BRS Guabiju	Controls (kg ha^{-1})			%	CV
			(kg ha^{-1})	T_1	T_2	T_{M2}	Relative*	%
RS	Inhacorá – season 1	2001	2964	3054	2592	2823	105	11
RS	Inhacorá – season 2	2001	2372	2294	2049	2171	109	14
RS	São Luiz Gonzaga	2001	2905	3545	2399	2972	98	14
RS	São Borja	2001	2427	2792	2627	2710	90	13
RS	Piratini	2001	1888	2060	1777	1918	98	17
RS	Tupanciretã	2001	2576	2839	1870	2355	109	11
RS	Tapera	2001	3035	2663	3190	2926	104	14
RS	Passo Fundo – Season 1	2001	2446	2784	2914	2849	86	12
RS	Passo Fundo – Season 2	2001	2960	3462	3626	3544	84	11
RS	Vacaria	2001	3999	4155	3701	3928	102	10
SC	Campos Novos	2001	3950	4991	4448	4720	84	6
PR	Cascavel	2001	2708	2681	2733	2707	100	10
PR	Guarapuava	2001	3529	2387	4096	3241	109	13
PR	Ponta Grossa	2001	3568	4090	4087	4089	87	13
MS	Ponta Porã	2001	2353	2835	2191	2513	94	13
Mean		2001	2.912	3109	2953	3031	96	
SP	Paraguaçu Paulista	2002	932	1019	1163	1091	85	20
SP	Manduri	2002	2400	1920	2127	2023	119	15
MS	Ponta Porã	2002	2947	2832	3456	3144	94	10
PR	Guarapuava	2002	4213	3465	2291	2878	146	10
SC	Campos Novos	2002	3477	3665	2294	2979	117	11
RS	Santa Rosa	2002	2922	2956	1840	2398	122	12
RS	Inhacorá	2002	1689	2066	770	1418	119	16
RS	São Luiz Gonzaga	2002	2950	2424	1853	2138	138	11
RS	São Borja	2002	3580	2726	2955	2841	126	17
RS	Tupanciretã	2002	2265	1691	2083	1887	120	8
RS	Tapera	2002	1962	2324	1141	1732	113	14
RS	Passo Fundo – Season 1	2002	2877	2829	3049	2939	98	6
RS	Passo Fundo – Season 2	2002	3187	2959	3139	3049	105	8
RS	Vacaria	2002	4779	4487	5143	4815	99	12
Mean 2002			2870	2669	2379	2524	114	
General mean			2892	2896	2676	2786	104	

In 2001: T_1 = BR 23 and T_2 = Rubi; 2002: T_1= CEP 24 and T_2= BR 18 (for Paraguaçú Paulista and Manduri in SP); T_1 = CEP 24 and T_2 = IPR 85 (for Ponta Porã-MS and Guarapuava-PR); and T_1 = CEP 24 and T_2 = RUBI (for Campos Novos-SC and the other counties of RS). T_{M2} = Control means. * = Relation percentage between the grain yield mean of controls and of cultivar BRS Guabiju. CV = Coefficient of variation of each trial

Table 2. Means of grain yield (kg ha^{-1}) of cultivar BRS Guabiju in the years 2003 and 2004 in the different adaptation regions defined by the Ministério de Agricultura Pecuária e Abastecimento (state-specific) control means of reference in each state and relative percentage of the cultivar used for extension of cultivation to the states Paraná and Mato Grosso do Sul

Year	Paraná			Mato Grosso do Sul		
	7	8	PR	9	10	MS
2003	3845	4264	3984	2675	-	2675
2004	3123	5077	3774	2710	2262	2560
Mean BRS Guabiju	3363	4303	3700[3]	2693	2520	2619[4]
Control Means	3407[1]	4264[1]	3672[1]	2722[2]	2334[2]	2592[2]
%*	98.7	100.9	99.7	98.9	108.0	103.5

[1] Control means BR 18 and CD 104. [2] Control means BR 18 and CD 5
[3] Mean of 8 environments of evaluation. [4] Mean of 9 environments of evaluation
* = Percentage between the mean of cultivar BRS Guabiju and the mean of the controls considered in each state

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