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BRS 254 – Wheat cultivar for irrigated conditions

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ABSTRACT -*The wheat cultivar BRS 254 was developed by Embrapa. It resulted from a cross between Embrapa 22*3 and Anahuac 75. The gluten strength of BRS 254 is high and the cultivar is suited for irrigated conditions.*

Key words: *Triticum aestivum*, cultivar, genetic breeding.

INTRODUCTION

The central region of Brazil, the Cerrado with approximately 500 thousand ha of area, is a potential for irrigated wheat cultivation. However, for 2007, an estimated area of only 50 thousand ha was cultivated with wheat in the states of Minas Gerais, Goiás, Distrito Federal and Mato Grosso. Despite an average yield of approximately 4.500 kg ha^{-1}, the regional wheat production is far from meeting the demand of the milling industry of local wheat, of over 1.5 million tons. The institutions Embrapa Trigo, Embrapa Cerrados, Embrapa Arroz e Feijão and the Escritório de Negócios do Triângulo Mineiro cooperate on a program of genetic wheat breeding for the Central Cerrado region of Brazil, with the objective of developing wheat cultivars adapted to the tropical edaphoclimatic conditions. This study had the objective of supplying the scientific and technological community with information on the wheat cultivar BRS 254, the first in the region obtained by the method of haplodiploidization, with a high yield potential and superior industrial quality for bread making.

PEDIGREE AND BREEDING METHOD

BRS 254 is derived from a backcross of the recurrent female parent Embrapa 22 with the parent Anahuac 75, performed in 1995, by the research institution Embrapa Trigo, in Passo Fundo, state of Rio Grande do Sul. The F_1 generation of this hybridization was grown in a screenhouse in the winter 1996, where one donor plant was selected visually. By the double-haploid technique, the line DHM 2818 was obtained, which was multiplied in the winter 1997 and denominated PF 973047. In the winter 1998 one line was sown on an experimental field of Embrapa

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Cerrados, in Planaltina/DF, and bulk harvested. In the subsequent years, the cultivar was tested at the local and regional experimental level, in Value of Cultivation and Use (VCU) trials in 2002, and evaluated in the states of Goiás, Minas Gerais, Mato Grosso and Distrito Federal.

PERFORMANCE

The performance of cultivar BRS 254 regarding grain yield is presented in Table 1. In the five years of evaluation the mean yield was 4.812 kg ha^{-1}, with a variation of 3.606 kg ha^{-1}, in Mato Grosso, to 5.789 kg ha^{-1}, in the Distrito Federal. The production potential observed a maximum grain yield of 7.040 kg ha^{-1} in 2004 in the Distrito Federal, a year of favorable climatic conditions. The mean relative superiority of BRS 254 over Embrapa 22 and Embrapa 42 was on average 3% at all locations and in all years, representing a gain of 141 kg ha^{-1}.

Cultivar BRS 254 was classified as improver wheat. It can be used in the fabrication of pasta, crackers, bread and blends with soft wheat types for bread making. The mean gluten strength during the period of experimentation was 330 x 10^{-4} J, varying from 297 to 383 x 10^{-4} J. In relation to the other qualitative traits, the mean protein content of BRS 254 was 11.4%, and the bands 1, 7+8 and 5+10 were found, referring to the high-molecular-weight glutenins. The grain was classified as hard with mean industrial yield of over 60% (standard moisture 14%).

Table 1. Means of grain yield (kg ha^{-1}) of cultivar BRS 254 and the controls Embrapa 22, Embrapa 42 and BRS 207, from 2002 to 2006, in different states of Brazil and relative grain yield percentage of cultivar BRS 254 compared to the control means

Year	Cultivar	MG	GO	DF	MT	Brazil
2002	BRS 254	5.641	3.729	5.481	-	4.950
	Embrapa 22	5.282	3.627	5.029	-	4.646
	Embraps 42	5.031	3.724	4.643	-	4.466
	Control Means	5.156	3.675	4.836	-	4.556
	% Relative	**109**	**101**	**113**	**-**	**109**
2003	BRS 254	4.980	3.524	3.530	3.606	3.539
	Embrapa 22	4.688	3.736	3.436	3.444	3.637
	Embraps 42	4.847	3.439	3.398	4.218	3.562
	Control Means	4.768	3.587	3.417	3.831	3.599
	% Relative	**104**	**98**	**103**	**-**	**98**
2004	BRS 254	5.464	6.790	7.040	-	6.431
	Embrapa 22	4.845	6.355	6.947	-	6.049
	Embraps 42	5.473	6.065	6.353	-	5.964
	Control Means	5.159	6.210	6.650	-	6.006
	% Relative	**106**	**109**	**106**	**-**	**107**
2005	BRS 254	6.063	3.320	6.192	-	5.170
	Embrapa 22	6.334	3.574	6.136	-	5.381
	Embraps 42	5.667	3.489	5.906	-	4.981
	Control Means	6.000	3.531	6.021	-	5.181
	% Relative	**101**	**94**	**103**	**-**	**100**
2006	BRS 254	3.666	-	6.700	-	4.677
	Embrapa 22	3.498	-	6.775	-	4.590
	Embraps 42	4.406	-	5.735	-	4.849
	Control Means	3.952	-	6.255	-	4.720
	% Relative	**93**	**-**	**107**	**-**	**99**
Mean 2002 a 2006	BRS 254	5.163	4.341	5.789	3.606	4.953
	Embrapa 22	4.929	4.323	5.665	3.444	4.861
	Embraps 42	5.085	4.179	5.207	4.218	4.764
	Control Means	5.007	4.251	5.436	3.831	4.812
	% Relative	**103**	**102**	**106**	**94**	**103**

MG = Minas Gerais; GO = Goiás; DF = Distrito Federal; MT = Mato Grosso

OTHER TRAITS

BRS 254 is a cultivar of hard red spring wheat, and is suitable for cultivation under irrigation. The performance in the test states indicated the cultivar for commercial-scale production, aiming at grain production in all wheat regions of the central region of Brazil (Commission 2005). The plant height (mean of 86 cm) is medium and the cycle early, for heading (55 days in mean) as well as for maturation (mean of 115 days). With regard to the main abiotic stresses inherent of the cultivation region, the cultivar is moderately lodging-resistant to natural threshing and natural ear germination and susceptible to soil aluminum toxicity. The reaction to the main wheat diseases is reasonable. It is characterized by susceptibility to leaf rust, powdery mildew, to Septoria nodorum, to scab and leaf blast. The reaction to spot blotch and tan spot is moderately susceptible. Under the production conditions in the Brazilian Cerrado, these reactions are no restriction to commercial production.

Morphologically, cultivar BRS 254 has predominantly erect leaves (40%), slightly colorful auricles (90%), fusiform ears and awns with light coloration at maturation and longish dark red grains.

SEED MAINTENANCE AND DISTRIBUTION

Cultivar BRS 254 was indexed by the Ministry of Agriculture, Animal husbandry and Supply (MAPA), under number 19882, certificate nr. 00896. The institution Embrapa Trigo is in charge of the genetic seed and Serviço Nacional de Tecnologia da Embrapa (SNT) is responsible for the basic seed of this cultivar.

BRS 254 – Cultivar de trigo para cultivo irrigado

RESUMO - *A cultivar de trigo 'BRS 254' foi desenvolvida pela Embrapa. Resultou de um cruzamento entre Embrapa 22*3 e Anahuac 75. 'BRS 254' apresenta elevada força de glúten e é recomendada para cultivo irrigado.*

Palavras-chave: *Triticum aestivum*, cultivar, melhoramento genético.

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