



## CD 113 – Early cycle wheat cultivar

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Received 16 September 2005

Accepted 14 March 2006

**ABSTRACT** - The cultivar CD 113 was developed by COODETEC and recommended for cultivation in the state of Paraná. This wheat cultivar has wide adaptation, low plant height, a short cycle, good industrial quality, and a mean grain yield of 2,288, 2,745 and 3,944 kg ha<sup>-1</sup> in the regions 6 (North), 7 (Central West) and 8 (Central South) of the state of Paraná, respectively.

**Key words:** crop breeding, wheat, CD 113

### INTRODUCTION

The increase in production area and yield of wheat is extremely important to supply part of the internal consumption of wheat. However, in the medium and long term self-catering is the overall goal, which re-orientates the crop breeding towards the development of cultivars of wide adaptation and high grain yield potential for different regions in Brazil. According to Destro and Montalván (1999), the definition of agronomic target traits to be improved is indispensable for the success of a crop breeding program. In this sense, the wheat breeding program of COODETEC focuses on the development of cultivars for the main wheat-producing regions of Brazil. CD 113 was indicated for cultivation in these regions in view of its wide adaptation, high grain yield potential, short cycle, and good industrial quality.

### PEDIGREE AND BREEDING METHODS

CD 113 was developed by the wheat breeding

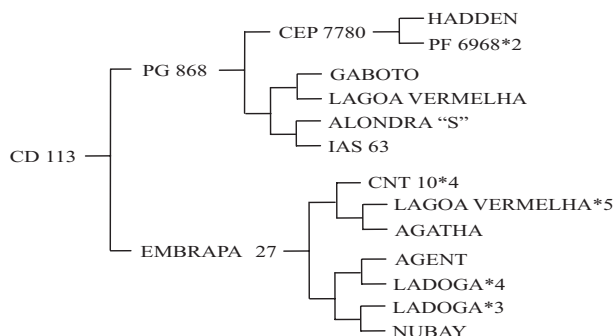
program of COODETEC (Figure 1). F<sub>1</sub> seeds were obtained by crossing parents EMBRAPA 27 and OC 946. The F<sub>2</sub>, F<sub>3</sub>, and F<sub>4</sub> populations were subjected to modified mass selection, which consisted in the selection of the best plants whose seeds were mixed and used to establish the next generation. The F<sub>5</sub> and F<sub>6</sub> populations in turn underwent selection by the pedigree method, which consisted in the selection of plants whose seeds were used in the establishment of a new population in the following generation (pedigree CO13712-00P-00P-13P-0P).

The F<sub>7</sub> populations were selected by the mass method, which gave rise to several lines. Amongst these, selection identified the line that originated the new cultivar CD 113.

### PERFORMANCE

After a preliminary evaluation, trials to determine the Value for Cultivation and Use (VCU) were realized in 2001, 2002 and 2003, at different sites and in various

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**Figure 1.** Pedigree of the new cultivar CD 113



**Figure 2.** Regions of adaptation for trials that determine the Value for Cultivation and Use (VCU)

periods in the adaptation regions 6 (North), 7 (Central West) and 8 (Central South) of the state of Paraná (Figure 2), under the acronym CD 200113. The VCU trials had a randomized block design with three replications. The 25 treatments were sown on six-row plots in 0.2 cm spacing, 5 m long, totaling 6 m<sup>2</sup>. Grain yield in the regions 6, 7 and 8 of the state of Paraná attained 6%, 4% and 9% higher values than the control means, respectively, in the three regions (Table 1). The good performance of the new cultivar CD 113 indicated it for cultivation in the wheat-growing regions 6, 7 and 8 of the state of Paraná (RCCSBPT, 2005), and it was registered in the Serviço Nacional de Proteção de Cultivares do Ministério da Agricultura, index nr. 00552, on February 18, 2004 (MAPA, 2005). In 2005, the indication of cultivation was extended to the regions 1, 2 and 3 of the state of Rio Grande do Sul, 4 and 5 of Santa Catarina, 9 and 10 of Mato Grosso do Sul, 11 and 12 of São Paulo, 13 of Minas Gerais, 14 and 15 of Goiás and 16 of Mato Grosso (Figure 2).

**OTHER TRAITS**

The new cultivar CD 113 presented means that classified it as moderately lodging resistant, moderately susceptible to pre-harvest sprouting and moderately tolerant to soil aluminum toxicity. The plant height of the new cultivar CD 113 is low, varying from 55 to 75 cm, and the cycle is early, between 46 and 70 days from emergence to flowering and 95 to 131 days from emergence to maturation (Table 2). The means of these traits were 66 cm, 60 days and 118 days, respectively, which vary with climate conditions, sowing seasons and soil type. The results of analysis of industrial quality, in 7 samples of experimentation in the state, attained in the mean 260 of general gluten strength (W), which includes CD 113 in the group of bread wheat cultivars, with a mean hectoliter weight of 77 kg.hL<sup>-1</sup>

**Table 1.** Mean grain yield (kg ha<sup>-1</sup>) of the new cultivar CD 113 and the controls in the wheat-producing regions 6, 7 and 8, in the state of Paraná, between 2001 and 2003

Cultivar	Region 6				Region 7				Region 8		
	2001	2002	2003	Mean	2001	2002	2003	Mean	2002	2003	Mean
CD 112	2505	1889	2469	2288	2769	2205	3262	2745	3150	4737	3944
Mean (C)*	2316	1708	2481	2168	2708	2166	3054	2643	3148	4072	3610

\*The controls used in the comparison were T. BR 18 T., IPR 85 and IAPAR 53 in the Regions 6 and 7 of Paraná and RUBI; and CEP 24 and BRS 49 in Region 8 of Paraná

**Table 2.** Means of days from emergence to flowering (EF), days from emergence to maturation (EM), plant height (PH), hectoliter weight (HW), weight of 1000 grains (WG), general gluten strength (GW), leaf rust (LR), leaf spot (LS) and powdery mildew of the leaf (PM) of the new cultivar CD 113 and the controls, in the VCU trials conducted in the Regions 6, 7 and 8 of Paraná in the period from 2001 to 2003

Cultivar	EF (days)	EM (days)	PH (cm)	HW (kg.hL <sup>-1</sup> )	WG (g)	GW (10 <sup>-4</sup> J)	LR (%)	LS (score) <sup>1</sup>	PM (score) <sup>1</sup>
CD 113	60	118	66	77	36	260	4	2.6	1.7
T. BR 18 T.	64	120	75	77	41	266	10	2.6	1.0
IAPAR 53	74	126	79	76	38	230	39	3.4	1.1
CEP 24	73	129	96	75	39	248	9	1.5	0.9
Mean (T)	70	125	83	76	39	248	19	2.5	1.0

<sup>1</sup>Score scale of 1 to 9

and weight of 1000 grains of 36 g (Table 2). The field experiments realized between 1999 and 2003 compiled data of different diseases in Brazil. Medium to high severity of powdery mildew (*Erysiphe graminis tritici*) attack was observed, expressing susceptibility. The cultivar was further susceptible to head blight (*Fusarium graminearum*), spot blotch (*Bipolaris sorokiniana*) and speckled leaf blotch (*Septoria tritici* and *S. Nodorum*). Severity indices of leaf spot and glume blotch were determined, which classified the new cultivar as moderately susceptible (Table 2). According to Reis et al. (2001) leaf rust (*Puccinia recondita* f. Sp. *Tritici*) is considered the most common disease of wheat. In the field evaluations the mean severity was low, suggesting that the new cultivar is moderately resistant (Table 2). The new cultivar CD 113 was classified as moderately resistant to wheat mosaic virus. This virus occurs, according to Reis et al. (2001), especially in the colder regions of Rio Grande do Sul and the Campos Gerais region of Paraná. The strong points of the new cultivar CD 113 are the high grain yield potential, broad adaptation, short cycle and good industrial quality (Franco et al. 2004).

## SEED MAINTENANCE AND DISTRIBUTION

COODETEC (BR 467 - km 98 - Caixa Postal 301 - CEP.85813-450 - Cascavel/PR, Brazil) is licensor of protected cultivars according to law nr. 9456/97. The institution contracts seed companies for the multiplication and trade. Besides, regional representatives work, under the supervision of specific administration, to promote seed commercialization and diffusion.

## REFERENCES

- Destro D and Montalván R (1999) **Melhoramento genético de plantas**. Editora da UEL, Londrina, 818p.
- Franco FA, Marchioro VS, Oliveira EF and Dalla Nora T (2004) Avaliação de rendimento de grãos e características agrônômicas da nova cultivar de trigo CD 113, no período de 2001 a 2003, no Paraná. In: **29ª Reunião da comissão Centro-Sul Brasileira de Pesquisa de Trigo**. Embrapa Soja, Londrina, p.108-111.
- MAPA - Ministério da Agricultura, Pecuária e Abastecimento (2005) Serviço nacional de proteção de cultivares. Assessed in <http://www.agricultura.gov.br/sarc/dfpv/lst1200.htm>
- Reis EM, Casa RT and Medeiros CA (2001) **Diagnose, patometria e controle de doenças de cereais de inverno**. MC Gráfica, Londrina, 94p.
- RCCSBPT - Reunião da Comissão Centro-Sul Brasileira de Pesquisa de Trigo e Triticale (2005) **Informações Técnicas da Comissão Centro-Sul Brasileira de Pesquisa de Trigo e Triticale para a safra de 2005**. Embrapa Soja, Londrina, 234p.