



CULTIVAR RELEASE

CD 119: A wheat cultivar for cold subtropical regions

Francisco de Assis Franco¹, Volmir Sergio Marchioro^{1*}, Ivan Schuster¹, Tatiane Dalla Nora¹, Edson Feliciano de Oliveira¹, and Fábio Júnior Alcantara de Lima¹

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ABSTRACT - *CD 119 cultivar is fit for the wheat regions VCU I and II, in the states of Paraná, Santa Catarina and Rio Grande do Sul. This soft wheat is tolerant to the main wheat diseases and has an average grain yield of 3735 kg ha⁻¹.*

Key words: Genetic improvement, soft wheat, grain yield.

INTRODUCTION

Wheat cultivation is gaining ever-increasing importance for producing and exporting countries, due to gains in the production volume, profitability and improved technological quality of harvested grain. Wheat flour for different industrial purposes is determined by several grain characteristics which in turn depend on cultivar and environmental conditions such as soil, climate, pest and disease incidence and crop management.

The cultivar is the factor that determines if the processing quality of wheat is improved, bread or soft, according to the norms no. 7 of August 15, 2001, of MAPA - Ministry of Agriculture, Livestock and Food Supply of Brazil. However, since the environment interacts with the cultivar (biotic, abiotic, and management factors), influencing the composition of the harvested grain, the resulting quality may fall short of the potential of the cultivar (Mandarino 1993).

In view of the required standard, COODETEC - Cooperativa Central de Pesquisa Agrícola - is bringing wheat cultivar CD 119 on the market. This soft wheat

cultivar is tolerant to the main wheat diseases and has a high potential grain yield.

Pedigree and improvement methods

CD 119 cultivar was derived from a cross between the genotypes BRS 49 and CDI 0303, conducted by COODETEC in 1998, in Curitiba, PR. The F₁ generation was advanced to F₂ in the same year in Cascavel, PR, by the modified mass method. Likewise, the F₃ generation was obtained in 1999, in Cascavel and conducted by the pedigree method in the same year. F₄ to F₆ populations were also conducted by the pedigree method in the following years, in Palotina, PR. The traits were fixed in the F₇ generation, resulting in several lines and, after testing, CD 0532 was named CD 119. The pedigree of this line is CO15070-0T-1G-4P-5P-0P.

Performance

The selected line CD 0532 was tested in preliminary trials in 2003 and 2004 and included in the tests of value for cultivation and use (VCU) in 2002. VCU tests were conducted in the states of Rio Grande do Sul, Santa

^{1*} Cooperativa Central de Pesquisa Agrícola (COODETEC), BR 467, km 98, C.P. 301, 85813-450, Cascavel, PR, Brazil. *E-mail: volmir@coodetec.com.br.

Catarina and Paraná, including the VCU wheat regions I and II (Cunha et al. 2006), as shown in Table 1.

The experiment was arranged in a randomized complete block design with three replications in plots consisting of six 5.0 m-long rows, spaced 0.20 m apart. Sowing was done mechanically after seed treatment with Triadimenol + Imidacloprid. Fertilization and pest and disease control were performed according to the technical recommendations (Commission 2008). The following variables were measured: grain yield, days from emergence to silking, days from emergence to maturity, plant height, lodging, test weight, 1000 kernel weight, and gluten strength. At some representative points of the wheat regions, cultivar CD 119 and some controls were sampled. For these samples, foliar diseases were not controlled to evaluate the severity of diseases such as leaf rust, leaf spots, powdery mildew, blight and wheat mosaic virus (Reis and Casa 2007).

Compared with the average grain yield in the wheat growing regions VCU I and II, the grain yield of CD 119 was by 9 and 6% higher than the mean of the two best controls, respectively (Table 2). In view of the good performance, CD 119 was indicated for the above regions, in the states of Paraná, Santa Catarina and Rio Grande do Sul. The cultivar was registered by the Serviço Nacional de Proteção de Cultivares do Ministério da Agricultura (Brasil 2009).

Other features

Cultivar CD 119 has an average plant height (65 to 110 cm), the cycle is average, with 55 to 89 days from

emergence to silking and 105 to 149 days from emergence to maturity. These characteristics can vary depending on weather conditions, sowing date and soil type. The awns of CD 119 are fusiform, in intermediate position and the plants are moderately lodging-resistant and moderately resistant to moderately susceptible to pre-harvest sprouting. In nine samples from the different states analyzed for processing quality, a mean gluten strength (W) of 117.10^{-4} J was found, classifying CD 119 among the group of soft wheat cultivars (Table 2). The flour quality of CD 119 is very characteristic for its destination, with a mean tenacity/extensibility ratio of 0.5.

One of the main yield-limiting factors in wheat, according to Silva et al. (2003), is soil aluminum toxicity. For such soils, tolerant or moderately Al-tolerant cultivars are ideal. Cultivar CD 119 is an important alternative in these cases, since it is tolerant to Al toxicity.

In 2003-2008 the reaction to the main wheat diseases was evaluated in the field (Table 2). The severity of powdery mildew (*Blumeria graminis* f.sp. *tritici*) was intermediate, in other words, CD 119 is moderately resistant to this disease. To head blight (*Fusarium graminearum*) CD 119 cultivar was classified as moderately susceptible; for blotch (*Bipolaris sorokiniana*) and leaf spot (*Septoria tritici* and *Stagonospora nodorum*) severe reaction was observed and the cultivar was classified as moderately susceptible. The average severity of leaf rust (*Puccinia triticina*) was low under field conditions, indicating moderate susceptibility.

Against wheat mosaic virus (Table 3), with high incidence in Rio Grande do Sul in the 2008 growing season,

Table 1. Number of tests of value for cultivation and use (VCU) with cultivar CD 119 conducted in each state, in the wheat regions VCU I and II, from 2005 to 2008

State	Region VCU I				Region VCU II			
	2005	2006	2007	2008	2005	2006	2007	2008
Paraná	-	4	4	4	3	4	3	3
Santa Catarina	1	-	1	1	1	-	1	2
Rio Grande do Sul	1	1	3	3	1	1	2	2

Table 2. Mean grain yields (kg ha⁻¹) of cultivar CD 119 and of the two best controls in the wheat regions VCU I and II, from 2005 to 2008

Region	Cultivar	2005	2006	2007	2008	Mean	%
VCU I	CD 119	3561	3701	3928	4812	4001	109
	Controls*	3424	3482	3561	4139	3651	100
VCU II	CD 119	2791	3901	3350	3832	3469	106
	Controls	2591	3712	3168	3622	3275	100

* The two best controls used in the comparison were 'Onix' and 'Safira' in 2005; 'Fundacep Nova Era' and 'Onix' in 2006, 'Fundacep Nova Era' and 'Safira' in 2007; and 'Fundacep Nova Era' and 'Onix' in 2008.

Table 3. Means of days from emergence to silking (ES), days from emergence to maturation (EM), plant height (PH), lodging (LO), hectoliter weight (HW), gluten strength (W), tenacity/extensibility ratio (P/L), leaf rust (LR), leaf spot (LS), powdery mildew (PM), blight (BL) and wheat mosaic virus (MV) of cultivar CD 119 and control 'Onix'

Cultivar	ES (days)	EM (days)	PH (cm)	LO (%)	HW (kg hl ⁻¹)	W (10 ⁻⁴ Joule)	P/L (ratio)	LR (%)	LS (score 0-9)	PM (score 0-9)	BL (score 0-9)	MV (score 0-9)
CD 119	72	124	85	10	78	117	0.5	25	3.7	2.2	3.2	1.5
Onix	72	125	84	5	77	248	1.5	57	3.8	1.8	3.0	2.0

CD 119 was classified as moderately resistant, joining the existing group of cultivars (Scheeren et al. 2005, Scheeren et al. 2006, Marchioro et al. 2007, Marchioro et al. 2008) with good resistance to this disease.

Seed maintenance and distribution

Licenses for protected cultivars are issued by COODETEC, in accordance with Law No. 9456/97 for seed companies that multiply and sell seeds under contract. Besides, market developers are in charge of launching and marketing the seeds under the management of a Coordinator of Marketing and Propaganda of Soybean and Wheat.

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