

IPR 110 - Soft wheat cultivar

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ABSTRACT - The wheat cultivar IPR 110, developed by IAPAR, presents as important traits a remarkable yield potential, and medium hard and red colored kernels. It is early in maturity and moderately tolerant to shattering and to soil aluminum. Additionally, it presents moderate resistance to leaf and stem rusts and moderate susceptibility to other leaf and spike diseases. The quality parameters indicated overall intermediate gluten strength, given by the alveographic W value of 170.10^{-4} Joules, and Hagberg Falling Number of 273 s, which indicates suitability for cookie and cake industry. IPR 110 flour blended with another, stronger wheat flour provides flour for bread baking. The mean grain yield over four seasons was 3940 kg ha^{-1} in the north, 3150 kg ha^{-1} in the center-west, and 3387 kg ha^{-1} in the southern region of Paraná State.

Key words: *Triticum aestivum*, grain yield, earliness, aluminum tolerance, broad adaptation.

INTRODUCTION

IPR 110 is a soft wheat (*Triticum aestivum* L.) cultivar developed at the Agricultural Institute of Paraná State (IAPAR). After evaluation from 1999 to 2002, under the inbred line denomination LD 982, it was released for cultivation in Paraná in 2003. A cultivation extension to the State of São Paulo and Santa Catarina is under request. In 2003, the cultivar was also submitted to the National Cultivar Registration (RNC) Office, where it received the Reference Number 15444 and to the National Service for Cultivar Protection (SNPC), under Certificate N° 508.

PEDIGREE AND BREEDING METHOD

The cultivar IPR 110 originated from a single cross of the cultivars PF 85202 and OC 852, in 1990, at the

Experimental Station of IAPAR in Londrina, State of Paraná, Brasil (Figure 1). The applied breeding method was the Pedigree, IP 13082-2L-7L-5L-7L-0L with annual selections of individual plants up to the F₆ generation at the IAPAR's Experimental Station in Londrina. A description of the Wheat Breeding Program and its objectives is found in Riede et al. (2001).

The derived advanced inbred line LD 982 was evaluated in the Preliminary Yield Trial in 1997; Regional Yield Trial in 1998; and State Yield Trials from 1999 to 2002. Variety description was obtained along with DHS experiments.

Breeder's seed was obtained at small steps, initiating when LD 982 was evaluated in a Preliminary Yield Trial. Thereafter, medium and large seed increases were realized, under maintenance of the original characteristics and genetic

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purity. Upon cultivar release, the stock of available Foundation Seed was 1500 bags (75 t), which were distributed among selected seed producers. Annually, a quantity of Breeder's seed is produced in order to provide new pure stock to be used as nucleus source for further generations.

PERFORMANCE

IPR 110 was evaluated for grain yield and general performance from 1999 to 2002 by the Cultivar Evaluation Network headed by IAPAR, Embrapa Soja, and Fundação Meridional as presented in Tables 1 to 3. The Quality

Laboratory of IAPAR evaluated the technological quality. Main evaluated characteristics are presented in Table 4. HMW - High molecular weight subunit glutenins of IPR 110 are: 2*; 7 + 9; 5 + 10, which scores 10 out of 10 (Payne et al. 1987). This cultivar, however, presents a 1B/1R chromosomal translocation from rye, which causes a decrease in quality performance, due to the presence of the protein SeCalin in the gluten. Although IPR 110 has been classified as soft wheat (weak gluten), the alveographic values (W) that measure gluten strength indicate a classification near wheat for bread making. It also presents a good balance between gluten tenacity and extensibility (P/L values). These characteristics

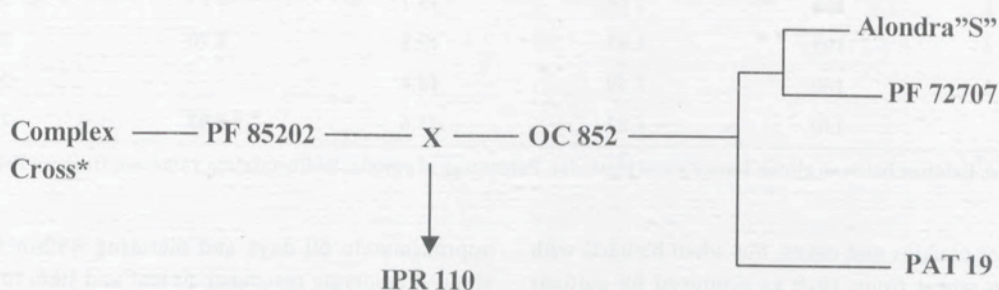


Figure 1. Pedigree of IPR 110

*PF 70354*4/Khapli/8*Chancellor//Londrina*5/KVZ/4/Londrina*4/Parana Precoz Inta/Tifton/3/CNT7*4/Yuma/8*Chancellor

Table 1. Average grain yield in kg ha⁻¹ of cultivar IPR 110 and respective controls, over four years of evaluation in the Adaptation Region 6 (north) of Paraná State

Cultivar	1999	2000	2001	2002	General Mean	% Controls
IPR 110	4919	3218	4622	3002	3940	108
BR 18	4664	3059	4200	2812	3684	101
BR 35	4825	2916	4216	2397	3589	99
Mean Controls	4744	2988	4208	2605	3636	100

Table 2. Average grain yield in kg ha⁻¹ of cultivar IPR 110 and respective controls, over four years of evaluation in the Adaptation Region 7 (center-west) of Paraná State

Cultivar	1999	2000	2001	2002	General Mean	% Controls
IPR 110	3721	2057	3851	2976	3151	110
BR 18	3689	1361	3158	3103	2828	98
BR 35	3342	1577	3594	3186	2925	102
Mean Controls	3515	1469	3376	3145	2876	100

Table 3. Average grain yield in kg ha⁻¹ of cultivar IPR 110 and respective controls, over four years of evaluation in the Adaptation Region 8 (south) of Paraná State

Cultivar	1999	2000	2001	2002	General Mean	% Controls
IPR 110	3227	2013	4633	3677	3387	112
BR 18	3123	1921	2406	3131	2645	88
BR 35	3767	2438	4305	3040	3387	112
Mean Controls	3445	2180	3355	3085	3016	100

Table 4. Technological quality parameters of cultivar IPR 110, evaluated from 1999 to 2002, at different locations of the Adaptation Regions 6 (north), 7 (center-west) and 8 (south) of Paraná State

Adaptation Regions	W ¹	P/L ²	PRO ³	SDS ⁴	FN ⁵
Mean of Region 6	153	2.17	13.7	9.17	308
Mean of Region 7	195	1.57	13.8	8.70	235
Mean of Region 8	160	1.59	13.4	-	252
General Mean	170	1.87	13.6	8.93	272

Alveograph value; Relation between gluten tenacity and elasticity; Percentage of protein; Sedimentation value and Hagberg Falling Number.

allow its use for cookies and cakes, but when blended with stronger gluten wheat flour, such as produced by cultivar IPR 85 (Riede et al. 2002), it is also suitable for baking French or pan bread (Riede 2001).

OTHER CHARACTERISTICS

IPR 110 is an early maturity cultivar, flowering after

approximately 60 days and maturing within 113 days. It showed moderate resistance to leaf and stem rusts, and was rated susceptible to head sprouting in artificially induced germination tests (Okuyama et al. 2003).

IPR 110 was released for cultivation in the Adaptation Regions 6, 7, and 8 considering the major attributes good yield potential and aluminum tolerance. Main agronomic traits and kernel properties are presented in the Tables 5 and 6.

Table 5. Agronomic traits of IPR 110 and control cultivars

Cultivar	Plant Maturity (d)	Plant Height (cm)	Lodging Resistance	Shattering Resistance	Aluminum Tolerance
IPR 110	113	74	MS ¹	MT ²	MT
BR 18	114	74	MS	MSE ³	MSE
BR 35	125	91	MS	MSE	T ⁴

¹Moderately susceptible; ²Moderately tolerant; ³Moderately sensitive; ⁴Tolerant.

Table 6. Kernel characteristics of IPR 110 and control cultivars

Cultivar	Kernel	Sprouting	Hectoliter	TKW ¹
	Hardness	Resistance	Weight	
			— g —	— g —
IPR 110	Medium Hard	S ²	77	37
BR 18	Hard	S	79	45
BR 35	Soft	MT ³	78	39

¹Thousand kernel weight; ²Sensitive; ³Moderately tolerant.

MAINTENANCE AND DISTRIBUTION OF FOUNDATION SEED

Foundation seed of IPR 110 is produced and distributed by IAPAR, at Rodovia Celso Garcia Cid, Km 375, P.O. Box 481. Seed samples for research and breeding purposes can be obtained at this address.

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