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## CULTIVAR RELEASE

### 'IPR 111' – Triticale cultivar

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**ABSTRACT** - *Triticale cultivar 'IPR 111', developed by IAPAR and CIMMYT is a high yielding and widely adapted winter cereal, with aluminum tolerance and resistance to the major foliar diseases. Triticale grain and flour have diversified uses. The cultivar was released for cultivation in all VCU regions of Paraná State.*

**Key words:** Triticale, high grain yield, aluminum tolerance, broad adaptation, multiple uses.

#### INTRODUCTION

IPR 111 is a triticale (*X Triticosecale* Wittmack) cultivar developed by the Agricultural Institute of Paraná State (IAPAR) and International Maize and Wheat Improvement Center (CIMMYT) in Mexico. After evaluation from 1998 to 2001 it was released for cultivation in Paraná in 2003, under the inbred line denomination TPOLO 9707. In the same year, the cultivar was registered by the National Cultivar Registration (RNC) Office, under the reference number 16022, on June 16, 2003.

Original hexaploid triticale is a cereal developed from a cross of durum wheat (*Triticum turgidum* L.) and rye (*Secale cereale* L.), with multiple uses of grain and flour. The flour is used in products such as cookies, cakes and pizzas, or blended with strong wheat flours for bread baking. Triticale is also widely used as animal feed, especially on chicken and pig farms.

#### PEDIGREE AND BREEDING METHOD

Cultivar IPR 111 was obtained from a single cross of the cultivars ANOAS 5 and STIER 13, in 1989, at the Experimental Station of CIANO in Obregon, State of Sonora, Mexico, by the CIMMYT Program. The Modified-Pedigree breeding method (CTB89.1174-20M-0Y-0M-2Y-0M-2B-0Y) was used in annual selections of individual plants or bulks in Toluca, Obregon or El Batan, up to the F<sub>8</sub> generation.

The advanced inbred line was then introduced through the 28° ITYN (International Triticale Yield Nursery) in 1996. It was evaluated in a Preliminary Yield Trial in 1997, denominated TP 9707 (TPOLO 9707). It was further evaluated in the Regional Yield Trial in 1998 and State Yield Trials from 1999 to 2002. The variety description was obtained along with the test of distinctness, homogeneity and stability (DHS).

Seed for breeding was obtained at small steps, initiating when TP 9707 was evaluated in a Preliminary

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Yield Trial. Thereafter, seed was multiplied at medium and large-scale, under maintenance of the original traits and genetic purity. Upon cultivar release, the stock of available Foundation Seed amounted to 1200 bags (60 t), which was distributed to selected seed producers. Annually, a quantity of breeder seed is produced in order to provide new pure stock to be used as source for further generations.

## PERFORMANCE

IPR 111 was evaluated for grain yield and general performance from 1998 to 2001, by the Triticale Cultivar Evaluation Trials of IAPAR, in the VCU regions 6 (North), 7 (Center and West) and 8 (South) of Paraná State (Tables 1 to 3). IPR 111 was superior in grain yield by 53, 31 and 14% in the three regions in comparison with the mean of the controls IAPAR 23 – Arapoti and IAPAR 54-OCEPAR 4. (Campos et al. 2002 and Silva et al. 2002).

## OTHER CHARACTERISTICS

IPR 111 is a medium maturity cultivar, which flowers after approximately 70 days and matures within 127 days.

It showed resistance to leaf and stem rusts, powdery mildew and smut and was rated moderately susceptible to fusarium head blight, leaf spot, and viruses such as BYDV and WSBM (Comissão 2005).

IPR 111 was released for cultivation in the Adaptation Regions 6, 7 and 8 of Paraná State, in view of the outstanding good yield potential and aluminum tolerance. Main agronomic traits and kernel properties are presented in the Tables 4 and 5.

## SEED MAINTENANCE AND DISTRIBUTION

Breeder and Foundation seed of triticale cultivar IPR 111 is produced and distributed by IAPAR (Rodovia Celso Garcia Cid, Km 375, P.O. Box 481), where seed samples for research and breeding purposes can be obtained. Certified seed is mainly produced by the Fundação Meridional de Apoio à Pesquisa Agropecuária in partnership with IAPAR.

**Table 1.** Average grain yield in kg ha<sup>-1</sup> of cultivar IPR 111 and respective controls, over three years of evaluation in the Adaptation Region 6 (North) of Paraná State

Cultivar	1998	1999	2000 <sup>1</sup>	2001	General Mean	% Controls
IPR 111	1528	6774	-	4218	4173	153
IAPAR 23	1056	4105	-	4312	3158	116
IAPAR 54	455	2760	-	3677	2297	84
Mean Controls	755	3432	-	3994	2727	100

<sup>1</sup> Data of 2000 were lost due to frost damage at heading time

**Table 2.** Average grain yield in kg ha<sup>-1</sup> of cultivar IPR 111 and respective controls, over four years of evaluation in the Adaptation Region 7 (Center-West) of Paraná State

Cultivar	1998	1999	2000	2001	General Mean	% Controls
IPR 111	1462	2484	2886	2206	2260	131
IAPAR 23	1339	1928	2610	1973	1888	110
IAPAR 54	1318	1711	2588	608	1556	90
Mean Controls	1373	2041	2695	1596	1722	100

**Table 3.** Average grain yield in kg/ha of cultivar IPR 111 and respective controls, over four years of evaluation in the Adaptation Region 8 (South) of Paraná State

Cultivar	1998	1999	2000	2001	General Mean	% Controls
IPR 111	3662	5012	3143	4105	3981	114
IAPAR 23	2848	5154	2972	3310	3571	102
IAPAR 54	2995	4986	2698	2977	3414	98
Mean Controls	2921	5070	2835	3143	3492	100

**Table 4.** Agronomic traits of IPR 111 and control cultivars

<b>Cultivar</b>	<b>Plant Maturity (d)</b>	<b>Plant Height (cm)</b>	<b>Lodging Resistance</b>	<b>Shattering Resistance</b>	<b>Aluminum Tolerance</b>
<b>IPR 111</b>	127	99	MR <sup>1</sup>	R <sup>2</sup>	T <sup>3</sup>
IAPAR 23	148	106	R	R	T
Embrapa 53	150	98	R	R	T

<sup>1</sup> MR: Moderately resistant; <sup>2</sup> R: Resistant; <sup>3</sup> T: Tolerant

**Table 5.** Kernel characteristics of IPR 111 and control cultivars

<b>Cultivar</b>	<b>Kernel Hardness</b>	<b>Kernel Color</b>	<b>Hectoliter Weight (g)</b>	<b>TKW<sup>1</sup> (g)</b>
<b>IPR 111</b>	Medium Hard	Light Red	67	38
IAPAR 23	Medium Hard	Red	70	35
Embrapa 53	Soft	Red	-	-

<sup>1</sup> TKM: Thousand kernel weight

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