

Races of *Puccinia triticina* in Brazil during the 2013 wheat season

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Introduction

The yield and stability of wheat production is affected by leaf rust disease almost everywhere in the world where wheat is cultivated. The disease could reduce the yield in 40 to 80%, depending on the host susceptibility, pathogen virulence, inoculum pressure, and environment conditions. The fungi *Puccinia triticina* Eriks. (Pt), causal agent of leaf rust disease, differentiates in many races. One to three new races were being identified in Brazil annually. A new race is like a new pathogen that overcomes the wheat resistance, turning the genes ineffective. The objective of this study was to monitor the virulent *Pt* population.

Material and Methods

Wheat and triticale leaves infected with *Pt* were collected in various wheat regions (field and experimental nurseries) during the 2013 wheat season in Brazil. The study was performed in greenhouse from August 2013 to June 2014. *Pt* pustules were isolated and increased to be inoculated in a differential set composed by 22 near isogenic lines with distinct leaf rust resistance genes *Lr1*, *2a*, *2c*, *3*, *3bg*, *3ka*, *9*, *10*, *11*, *14a*, *14b*, *16*, *17*, *18*, *20*, *21*, *23*, *24*, *26*, *30*, *19*, *27+31* and ORL04002 (derived from Onix and Toropi). The races were differentiated by the avirulence and virulence reaction in the first leaf of each line. During 2013 season, 152 samples were collected, and 91 samples were analyzed.

Resultados

Wheat Rio Grande do Sul	Wheat Paraná	Triticale Rio Grande do Sul São Paulo
TFT-MT <i>Lr3bg</i> – 16%	TFT-MT <i>Lr3bg</i> – 25%	BB(FP)-BS
TFT-MT <i>Lr3bg</i> , 4002 – 33%	TFT-MT <i>Lr3bg</i> , 4002 – 26%	BBB-BB
TDS-MR <i>Lr3bg</i> , 4002	TFT-PT <i>Lr3bg</i> , 4002 – 12%	BBC-BC
TDT-MR <i>Lr3bg</i>	MDM-MC <i>Lr27+31</i> , 4002	BBG-BQ
TDT-MR <i>Lr3bg</i> , 4002	MDT-MR <i>Lr3bg</i> , 4002	CBG-CG <i>Lr3bg</i>
TDT-MT <i>Lr3bg</i>	MFP-MT	MDF-MC
TFP-MK <i>Lr3bg</i> , 4002	MFP-PT <i>Lr3bg</i> , 4002	MDQ-(BL)B
TFP-MT 4002	TDR-MR <i>Lr3bg</i> , 4002	MFN-CS
TFP-MT <i>Lr3bg</i>	TDT-MC 4002	MFP-CS <i>Lr3bg</i>
TFT-MT 4002	TDT-MM 4002	RDP-B <i>Lr3bg</i>
TFT-PT <i>Lr3bg</i>	TDT-MR 4002	TBR-MR 4002
TFT-PT <i>Lr3bg</i> , 4002	TDT-MR <i>Lr3bg</i> , 4002	TDP-MR <i>Lr3bg</i> , 4002
	TDT-MT <i>Lr3bg</i> , 4002	TDT-PT 4002 R and S
	TDT-MT <i>Lr3bg</i> , 27+31, 4002	TFP-MR <i>Lr3bg</i> , 27+31, 4002
	TFP-PT <i>Lr3bg</i>	TFT-MT
	TFT-MR <i>Lr3bg</i>	TFT-MT <i>Lr3bg</i>
	TFT-MR <i>Lr3bg</i> , 4002	
	TFT-MT 4002	

Conclusão e Discussão

Wheat

2004 a 2007: MDT-MT

2007 a 2010: MDT-MT 4002

2013: TFT-MT (70% of the samples)

Predominant
races

New races were not identified in 2013 in Brazil.

Races in RS were more virulent than in PR.

Triticale

Virulent and avirulent races.

One of the possible reasons to the reduction in the pathogen population variability could be the low diversification of wheat genotypes, caused by the predominance of one or few cultivars with the same or similar leaf rust resistance being cultivated in large areas of a region. Therefore, the replacement process of these cultivars could conduct to a high selection pressure on the fungi population, inducing the identification of new *Pt* races in the following years.

The virulence of *P. triticina* has been increased in the last years, reducing the effective genes to be introduced in new wheat and triticale cultivars.

