

**CHARACTERISATION OF BRAZILIAN WHEAT CULTIVARS IN RELATION TO THE PRESENCE OF THE GENE *Fhb1* FOR RESISTANCE TO FUSARIUM HEAD BLIGHT**

Scheeren PL<sup>1</sup>, Fernandes JMC<sup>1</sup>, Caierão E<sup>1</sup>, Consoli L<sup>1</sup>, Lima MIPM<sup>1</sup>, Santana FM<sup>1</sup>, Bonato ALV<sup>1</sup>, Nicholson P<sup>2</sup>, Uauy C<sup>2</sup>

<sup>1</sup> Embrapa Trigo, Passo Fundo, RS, Brazil; <sup>2</sup> John Innes Centre, Norwich, UK

pedro.scheeren@embrapa.br

Fusarium Head Blight (FHB) is an important fungal disease caused by *Gibberella zeae*, affecting wheat growing areas in the world. In Brazil, FHB is one of the most important wheat diseases, especially, in the southern states. In addition to the direct damage to yield and reduction in flour quality, the greatest danger attributed to FHB is the contamination of grains with toxic secondary metabolites known as mycotoxins. In Brazil, the most prevalent mycotoxins are deoxynivalenol (DON) and nivalenol (NIV). Genetic resistance to FHB is generally controlled by several genes with moderate or weak effect, defined by “quantitative trait loci” (QTLs). In contrast the resistance of the Chinese wheat cultivar “Sumai 3”, is controlled in part by genes of major effect, the most potent being *Fhb 1*. The *Fhb1* has been considered the most effective gene for resistance to FHB. As a result, *Fhb1* is present in many commercial cultivars exhibiting high levels of resistance to FHB around the world. Thus, the characterization of the Brazilian wheat cultivars concerning the presence of this gene is crucial for future attempts to enhance FB resistance in wheat. The “Brazilian collection of wheat cultivars - 2012”, consisting of 90 wheat cultivars from different breeding companies was planted at the John Innes Centre in Norwich, Norfolk, England. At the three-four leaf stage, DNA was extracted from leaf tip samples collected from individual cultivars. Then, it was analysed for the presence of *Fhb1*, using the methodology described in RAMIREZ-Gonzalez et al. (2015). Surprisingly, the results showed a complete absence of the *Fhb1* gene in all 90 Brazilian wheat cultivars. Thus, it can be concluded that those 90 wheat cultivars here analyzed, which were present in the recommended list in 2012, and showing different resistance levels to FHB, are carriers of various resistance genes that differ from the *Fhb1* gene. Considering this information, incorporating the *Fhb1* gene in Brazilian wheat cultivars that already have moderate levels of resistance should enhance resistance to FHB. On the other hand, it is also apparent that further studies are needed to clarify the origin of the resistance present in Brazilian germplasm, as well as for the development of new molecular markers to assist in pyramiding these genes present in Brazilian wheat cultivars.

Keywords: fungal disease; breeding; genetic resistance