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Marker assisted breeding for improving Fusarium head blight resistance in wheat

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Abstract

Breeding for Fusarium head blight (FHB) resistance of wheat is a continuous challenge for plant breeders. Resistance to FHB is a quantitative trait, governed by several to many genes and modulated by environmental conditions. QTL for FHB resistance have been detected on virtually all wheat chromosomes, but only a few have been validated so far for their usefulness in breeding (BUERSTMAYR et al. 2009). The presented study was undertaken to assess the effect on improving FHB resistance of two resistance QTL, i.e. *Fhb1* and *Qfhs.ifa-5A*, from the CIMMYT spring wheat line CM-82036 when transferred by marker assisted back-crossing in European winter wheat. To achieve these goals we developed and evaluated 15 BC2 derived families based on 9 European winter wheat varieties as recipients and the FHB resistant line CM-82036 as resistance donor. Winter wheat back-cross lines with one QTL from the resistant donor showed a clear tendency towards increased FHB resistance. On average lines with *Fhb1*+*Qfhs.ifa-5A* were only slightly more resistant compared to lines with *Fhb1* alone. The obtained results suggest that the effect of the spring wheat derived QTL on improving FHB resistance increases in the order *Qfhs.ifa-5A*<*Fhb1*≤*Qfhs.ifa-5A*+*Fhb1*. The genetic background of the recipient line had huge impact on the resistance level of the obtained lines. No systematic negative effect of the spring wheat derived QTL on grain yield, thousand grain weight, hectolitre weight and protein content was found. The use of spring wheat derived FHB resistance QTL for breeding high yielding cultivars with improved FHB resistance appears therefore highly promising. For more details see SALAMEH et al. (2011).

Keywords
Fusarium head blight, QTL performance, resistance breeding, *Triticum aestivum*

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Note: A similar contribution was presented at the 11th European Fusarium Seminar, Radzikow, 20-24 Sep 2010, at the US Fusarium Head Blight Forum, Milwaukee, 7-9 Dec 2010 and the 21st ITMI Workshop, Mexico, 5-9 Sep 2011.

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