

Development and evaluation of winter wheat breeding lines carrying Fusarium head blight QTLs from spring wheat

Aziz Salameh^{1,2}, Bachar Almaghrabi^{1,3} and Hermann Buerstmayr^{1*}

Abstract

A series of BC₂ derived lines were developed from crosses of CM-82036 (Fusarium head blight (FHB) resistant spring wheat) with 11 winter wheat lines or cultivars as recurrent parents. BC₂ derived lines were chosen with either two QTL (*Fhb1*-3BS, *Qfhs.ifa-5A*), one of these or no QTL by use of linked SSR markers and evaluated for FHB severity in replicated field trails. Lines based on moderately resistant recurrent parents showed lower average FHB severity compared to lines based on susceptible recurrent parents. When comparing the FHB severity of related lines descending from the same recurrent parent but carrying different combinations of the two QTL, the general trend was that FHB severity decreased most when both spring wheat derived QTL (*Fhb1* and *Qfhs.ifa-5A*) were present and less when only one QTL was present. BC₂ derived lines with the winter

wheat alleles at both QTL regions showed generally more disease severity than lines with one or both QTL from spring wheat. Presence of *Qfhs.ifa-5A* increased plant height by 5-15 cm. All in all, introduction of two large effect QTL from spring wheat had a significant effect in reducing FHB susceptibility of winter wheat breeding lines.

Keywords

Marker assisted selection, QTL, *Triticum aestivum*, validation

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¹ BOKU, University of Natural Resources and Applied Life Sciences Vienna, Department IFA-Tulln, Institute for Biotechnology in Plant Production, Konrad Lorenz Straße 20, A-3430 TULLN

² Hebron University, Hebron, Palestine

³ BOKU-University of Natural Resources and Applied Life Sciences, Vienna, Department for Applied Plant Sciences and Plant Biotechnology, Institute for Plant Protection, Peter-Jordan-Str. 82, A-1190 VIENNA

* Ansprechpartner: Dr. Hermann BUERSTMAYR, hermann.buerstmayr@boku.ac.at