Mapping of Common Bunt Resistance Gene *Bt9* in Hexaploid Wheat

Philipp Steffan[1], Sven Bode Andersen[1], Anna Maria Torp[1], Anders Borgen[2], Søren K. Rasmussen[1], Erik Tybirk[3], and Gunter Backes[1,4,*]

[1]*University of Copenhagen, Department of Plant and Environmental Sciences, Thorvaldsensvej 40, 1871 Frederiksberg, Denmark*
[2]*Agrologica, Houvej 55, 9550 Mariager, Denmark*
[3]*Nordic Seed A/S, 8464 Galten, Denmark*
[4]*University of Kassel, Department of Organic Agricultural Sciences, Nordbahnhofstrasse 1a, 37213 Witzenhausen, Germany*
[*]*gbackes@uni-kassel.de*

Knowledge of chromosomal locations of common bunt resistance genes in wheat is still incomplete. Amongst those unmapped genes is also the highly effective gene designated *Bt9*. A double haploid population from a cross between wheat accession PI-554099 (ARS-GRIN gene bank), carrying resistance gene *Bt*9, and the common bunt susceptible wheat cv. Cortez (Wiersum plant breeding, Netherlands) was utilized to map the common bunt resistance gene *Bt9* in wheat.

A number of 94 double haploid lines and their parents were evaluated for two years for their resistance reaction towards common bunt, both under field and greenhouse conditions. Resistance reactions were recorded as the percentage of bunt infected heads from all heads of each line. Results were log-transformed to fit a 1– 9 scale.

Genotyping was carried out with DArTSeq markers (Diversity Arrays Technology, Australia), resulting in 3521 polymorphic single nucleotide polymorphism markers. A consensus map, allocating markers to linkage groups, was created based on the double haploid population under study in this project and two other populations from other studies, resulting in 24 linkage groups.

Simple interval mapping was carried out using the SuperQTL program and the rqtl package of the R programming language, indicating a major QTL explaining 40% and 47% of the observed phenotypic variance in 2012 and 2013, respectively. No evidence for further QTL was found. In order to locate the linkage group containing the QTL the marker sequences were blasted against public databases of wheat sequences. The linkage group was found to be located on the long arm of wheat chromosome 6D. We thus concluded that common bunt resistance gene *Bt9* is located on wheat chromosome 6DL.