Preliminary Genetic Mapping of Common Bunt Resistance Gene Bt4

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Abstract

Briggs (1933) reported a third factor for resistance to common bunt (*Tilletia caries*) in crosses involving 'Turkey 1558' and 'Turkey 3055'. Metzger (1970) later renamed the Turkey Factor 'Bt4' and proposed the line 'Turkey' (PI 11610) as differential line.

Stanford (1941) found a resistance factor in the variety 'Rio', later denominated Bt6 by Metzger (1970). It has long been known that Bt4 and Bt6 are tightly linked (Schaller and Briggs 1955), and behave identically in phenotyping (Borgen *et al.* 2023, Matanguihan 2011, Goates 2012). To investigate this potential linkage, an extended interval at 1B containing the Bt6 interval was used to perform a haplotype comparisons in lines postulated to have Bt4, including most varieties from the historic papers.

Bt4 is located in the 20,538,676 bp interval 7,480,290 – 28,018,966 bp at 1B overlapping the Bt6 interval at 16,381,367 – 28,018,966 bp. Lines containing Bt4 and Bt6 have identical haplotypes in the Bt6 interval, indicating that Bt4 and Bt6 is the same gene and is located within the Bt6 interval.

References

Borgen A., Monika K. Forster, Somayyeh Sedaghatjoo, Dennis Kjær Christensen, Wolfgang Maier 2023: Determination of virulence of European races of common bunt using a differential set of wheat cultivars Proceedings of the XXII International Workshop on Bunt and Smut Diseases. BOKU, Austria.. 16-18

Brigss, Fred N. 1933: A Third Genetic Factor for, Resistance to Bunt, Tilletia tritici, in Wheat Hybrids. n Journal Genetika. DOI:10.1007/BF02981755

Goates, B. J. (2012). Identification of New Pathogenic Races of Common Bunt and Dwarf Bunt Fungi, and Evaluation of Known Races Using an Expanded Set of Differential Wheat Lines. Plant Disease March 2012 361-369.

Metzger, R.J. 1970: Wheat genetics. Wheat Newsl. 17:122-125

Schaller, C. W. and F. N. Briggs 1955: Linkage Relationships of the Martin, Hussar, Turkey, and Rio Genes For Bunt Resistance in Wheat.

Matanguihan Glafera Janet B. 2011: Identification of Pathogenic Races and Microsatellite Markers of Tilletia Caries (D.C.) TUL. & C. TUL. And Mapping of a Common Bunt Resistance Gene in Winter Wheat. phd thesis, Agricultural and Food Sciences, Biology. Corpus ID: 86320852

Stanford, E. H. 1941.: A new factor for resistance to bunt, Tilletia tritici, linked with the Martin and Turkey factors. Jour. Amer. Soc. Agron. 33:559-568.