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Resistance to powdery mildew (*Blumeria graminis f. sp. hordei*) in winter barley, Poland

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Powdery mildew (*Blumeria graminis f. sp. hordei*) is the most economically important barley pathogen. This wind borne fungus causes foliar disease and yield losses rich up to 20-30%. Resistance for powdery mildew is the aim of numerous breeding programmes. The transfer of the MLO gene for resistance to powdery mildew into winter barley cultivars using Marker-Assisted Selection(MAS) strategy is presented. These cultivars are characterized by high and stable yield under Polish conditions. Field testing of the obtained lines with MLO resistance for their agricultural value was conducted. Four cultivars (Souleyka, Titus, SU Vireni and Metaxa) as high yielding parents were used. In addition, existing resistance genes to powdery mildew in these cultivars were preserved. Two lines (BKH 735 and line 42) as parents with MLO resistance were used. Line BKH 735 was obtained in IHAR-PIB Radzików in 2002-2011. Selection for presence of the MLO gene was conducted in backcross populations by phenotyping in the field (natural infection) and under green house conditions (differential barley lines for resistance genes for powdery mildew and differential fungus isolates). In addition, to confirm the presence of the MLO gene in back cross populations MAS strategy was applied using SSR markers HvMLO1 and HvMLO3. Field trials with back crossed lines were conducted during 2017/18 in three locations in Central (Radzików) and Western Poland (Szelejewo, Wiatrowo). The parental lines were used as control. The aim of these trials was to obtain information on agricultural value of obtained lines. Our results demonstrate the practical use by the introduction of MLO resistance into background of winter barley germplasm with valuable economical characteristics in Polish agricultural conditions. This work was conducted in the project: Interaction between powdery mildew (*Blumeria graminis f.sp. hordei*) resistance determined by MLO gene and economical value characteristics in winter barley.

Biography

Jerzy H Czembor has completed his PhD from Montana State University, Bozeman, USA in 1995. He is a Professor of Agriculture in 2012; Head of Laboratory of Applied Genetics during 2008-2016 as well as Head of Department of Plant Breeding and Genetics during 2011-2016 and; Head of National Centre of Plant Genetic Resource during (Polish Gene Bank) 2016-2018. He is a Coordinator and partner in several national and international projects and member of several domestic and international scientific associations. He is author of more than 200 scientific papers and communications and also interested in agricultural sciences, plant pathology, plant genetic resources management, biodiversity, molecular biology, Marker-Assisted Selection(MAS), plant physiology, genetics, plant breeding and Integrated Pest Management (IPM).

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