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From genes to field: advances in breeding and management of blackleg disease in Poland

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Blackleg disease, caused by the fungal pathogen Leptosphaeria maculans, is one of the most significant yield-limiting factors that affects rapeseed (*Brassica napus*) production worldwide. The disease can have a severe impact on the profitability of rapeseed plantations. In Poland, it has become one of the major concerns, with reports of significant yield losses in some regions.

Due to the increasing pathogen pressure caused by intensive crop farming and changing climate conditions, breeding for resistance has become the primary focus of rapeseed breeding programs in recent years. The development of novel cultivars with improved resistance is a key strategy for managing the blackleg disease, however, the effectiveness of the new genotypes can be influenced by environmental factors and the presence of new pathogen strains. Therefore, there is a constant need of broadening the gene pool of *B. napus*, which can be achieved by the use of wild relatives from *Brassicaceae* family. The aforementioned species can be used as a resistance donor in interspecific hybridization or as a study material for R genes and QTL localization.

In recent years, the advances in molecular and sequencing research have accelerated the identification and selection of genes associated with resistance to blackleg disease. The combination of novel techniques and traditional breeding approach has led to the selection of improved individuals, and consequently to the development of new *B. napus* cultivars.

During the presentation, we will discuss the advancements made in breeding for resistance to blackleg in Poland in comparison to other main rapeseed producers. We will focus on the latest reports regarding the identification and selection of resistant cultivars. Moreover, we will also provide an update on the current status of blackleg disease in Poland and discuss the effectiveness of different management strategies, including the use of fungicides and cultural practices.