

Gaining ground against Cercospora – Sustainable disease control with CR+

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J. C. Lein¹, H. Keunecke¹, F. Kopisch-Obuch¹, H. Ebmeyer¹, E. Neu¹ & M. Rekoske²

¹KWS SAAT SE & Co. KGaA, Grimsehlstr. 31, 37574 Einbeck

²KWS Seeds LLC., 1325 Valley View Road, Shakopee, MN 55379

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Introduction

Cercospora Leaf Spot (CLS) is one of the most detrimental diseases of sugarbeet worldwide. Beside fungicide use, growing varieties with improved resistance is the most important tool for Cercospora control.

Combining multiple resistance sources, CR+ varieties have shown significantly improved Cercospora protection along with excellent yield performance. This offers great value to growers and is already widely used in many growing areas impacted by Cercospora across North America and Europe.

CR+ trait

Classic varieties with traditional sources of Cercospora protection offer a certain level of Cercospora control, what is expressed by a medium Cercospora incidence (Fig. 1). As a result of intensive breeding, new strong and traditional resistance sources were combined. This combination leads to higher disease suppression and a distinctly lower disease incidence, marketed as CR+ trait.

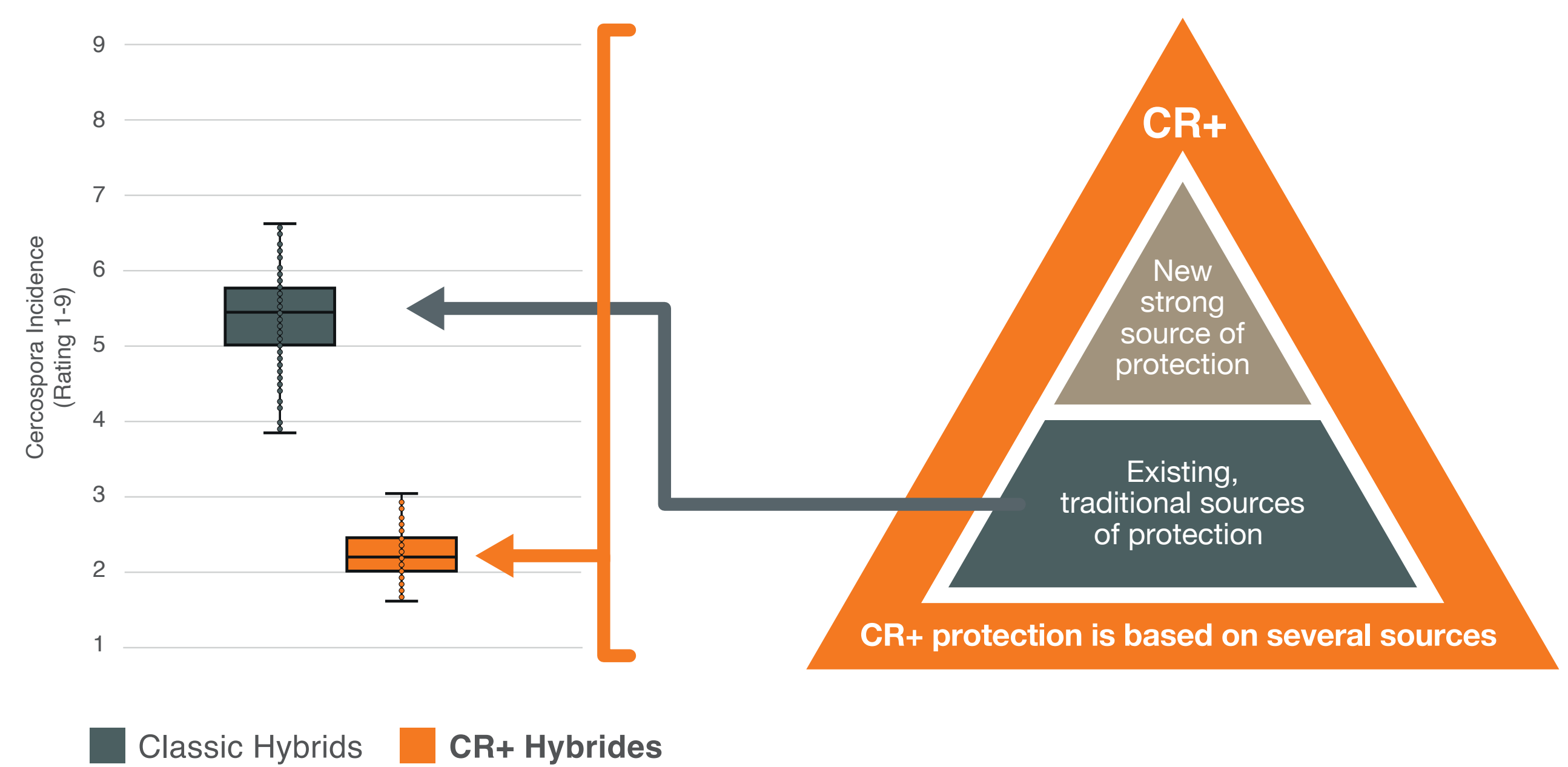


Fig. 1: Cercospora incidence of classic hybrids only with traditional sources and CR+ hybrids with combination of new and traditional sources of protection. Without fungicide protection, 3 repl., KWS internal trial 2022, Italy.

Combination of Cercospora protection and yield performance

While historically there has been a negative correlation between genetic Cercospora protection and yield performance in the absence of the disease, CR+ varieties combine high Cercospora protection with high yield performance. For CR+ varieties the disease development is slowed down, and disease incidence is reduced compared to classic hybrids (Fig 2). This effect is most pronounced without fungicide protection. Depending on the disease pressure in different years, Cercospora incidence can also vary in CR+ hybrids. However, the increase in CR+ is lower compared to classic hybrids.

The high level of protection is combined with a high yield performance (Fig. 3). In both years with different Cercospora incidence in CR+, the CR+ hybrids yielded higher compared to classic hybrids. This emphasizes that the historically negative correlation is overcome, and Cercospora protection can be combined with yield performance.

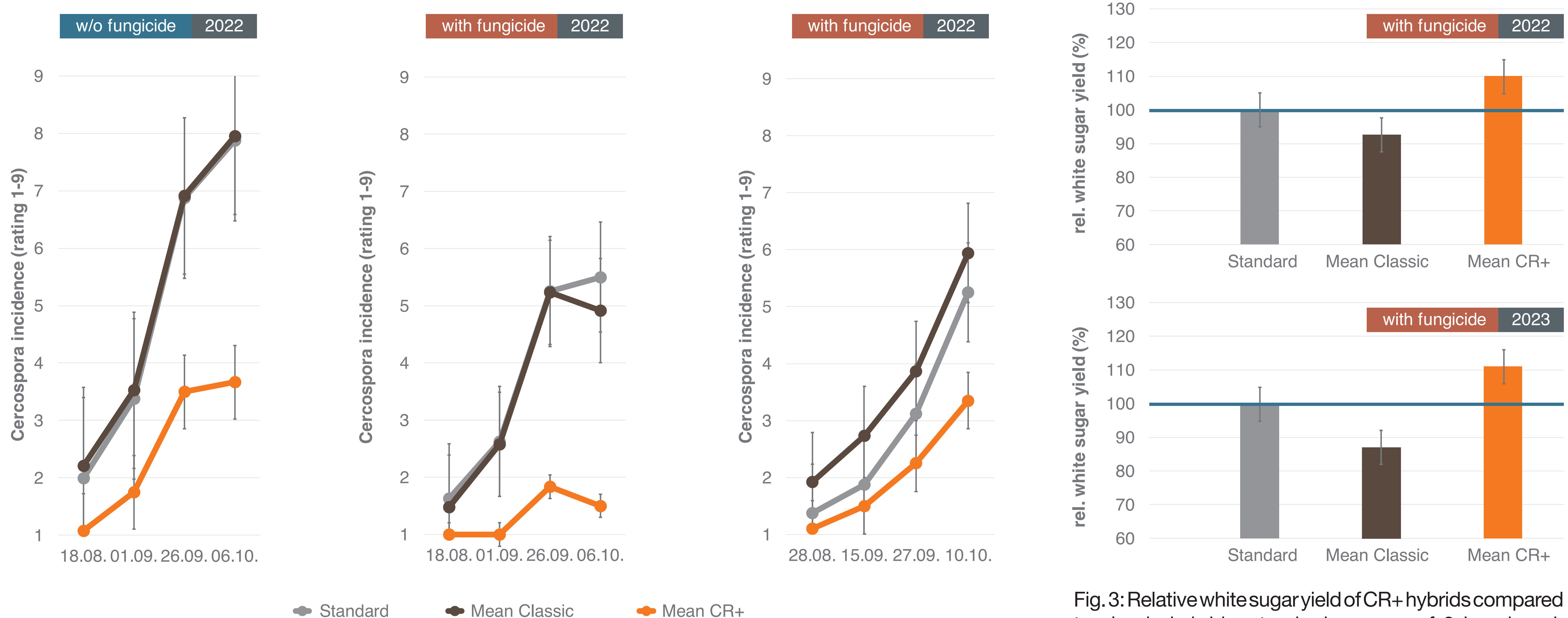


Fig. 2: Cercospora disease development of CR+ hybrids compared to classic hybrids, CLS incidence rating 1-9, standard = mean of 2 benchmark varieties, mean of classic = mean 20 or 13 Non-CR+ hybrids, mean of CR+ = mean of 3 or 5 CR+ hybrids for 2022 and 2023 respective, 4 repl., Oberhausen, Austria, official variety trials, serie 304/315, AGES.

Fig. 3: Relative white sugaryield of CR+ hybrids compared to classic hybrids, standard = mean of 2 benchmark varieties, mean of classic = mean 20 or 13 Non-CR+ hybrids, mean of CR+ = mean of 3 or 5 CR+ hybrids for 2022 and 2023 respective, 4 repl., Oberhausen, Austria, official variety trials, serie 304, AGES.

Conclusion/Outlook

CR+ is a powerful genetic tool for Cercospora control. For gaining ground against Cercospora in the long-term, CR+ needs to be combined with fungicide applications and agronomic measures. Also in regard to the evolutionary potential of the pathogen *Cercospora beticola*, the implementation of an Integrated Cercospora Management (ICM) approach is crucial. A decline in the effectiveness of fungicides demonstrates the importance of strong and durable genetic Cercospora control options. However, to support the durability of genetic Cercospora protection in the long-term, all stakeholders along the value chain, from breeders, sugar industry and advisory services to growers, are needed to implement ICM in practice to achieve sustainable Cercospora control.

