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Rotating DMI fungicides within spray programs to manage *Cercospora beticola* in sugar beet.

Cercospora leaf spot (CLS), a devastating foliar disease of sugarbeet, is caused by the fungal pathogen *Cercospora beticola* and is primarily managed by use of fungicides. Demethylation inhibitor (DMI) fungicides are typically applied two to three times in a growing season as a tank-mix with a broad-spectrum contact fungicide. In recent years, *C. beticola* isolates have developed patterns of cross-resistance to select DMI fungicides. In 2023 and 2024, field trials were conducted to evaluate the efficacy of 4-spray programs with two alternating DMI fungicides, beginning with either tetraconazole (TET) or mefentrifluconazole (MEF) in the first application and rotating with either a pre-mix of difenoconazole (DIF) + propiconazole or prothioconazole (PRO) in the third application. Weekly CLS severity ratings were used to calculate the standardized area under the disease progress stairs (sAUDPS). Additionally, 5 leaves were collected from each plot at the end of the season to assess CLS severity and obtain multiple single-conidia isolates. The effective concentration of fungicide that inhibits 50% of growth compared to the control (EC_{50}) was determined for TET, MEF, DIF, and PRO using a microplate-based assay. A multiplex probe-based qPCR assay was used to distinguish between five potential haplotypes (A-E) of *CbCyp51*, which encodes the DMI target enzyme. CLS severity was significantly lower in all fungicide treatments compared to the nontreated control. Despite known cross-resistance among TET and PRO, and MEF and DIF, these fungicides effectively managed CLS in spray program that utilized multiple mode-of-action fungicides as tank-mix partners. In 2023, haplotype E was predominant among the isolates which is known to be associated with decreased sensitivity to all four DMI fungicides. Overall, the evaluation of DMI fungicide spray programs and their impact on the development of fungicide resistance will help maintain their continued effectiveness and minimize economic losses in sugarbeet.