

# AGRICULTURAL BEET

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Cercospora Leaf Spot  
Triazole Fungicide Use

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## Triazole (DMI) Fungicide Use in a Cercospora Fungicide Program

The 2020 sugar beet crop is off to a great start and holds the potential for an excellent crop. The early planting and excellent crop growth has made a very timely and effective fungicide spray program important. For many years, the importance of rotating fungicide modes of action have been an important part of both effective CLS control, but also an important part of CLS fungicide resistance management. Recent data suggests that not only is it important to tank-mix and rotate fungicide modes of action, but rotating the triazole fungicide used through the season is also an important part of effective control and resistance management. In this edition of the Agricultural Beet, we will discuss triazole (DMI) fungicide rotations.

### The Science Behind the Recommendation to Rotate Triazoles

Every season SMBSC Agricultural Staff takes leaf samples from 20 fields across their growing district to monitor for fungicide resistance to Cercospora leafspot. These samples are sent to Dr. Gary Secor at North Dakota State University (NDSU) where Dr. Secor and his team analyze the leaf samples for CLS resistance to multiple fungicides and fungicide families. Below are observations from Dr. Secor and his team.

In laboratory and greenhouse trials conducted at NDSU, Dr. Gary Secor found the intrinsic activity of the various DMI fungicides is not the same. This can be measured by cross-reactivity of the fungicides. Fungicides with higher cross reactivity increase the risk of continued resistance, and those with lower cross resistance decrease the risk of continued resistance. Our recommendation is to rotate fungicides during the growing season because that gives growers a better chance of managing fungicide resistant *C. beticola* in the field. Of course, the profile of fungicide resistance for managing CLS varies among fields and is not predictable until the field is tested. So the best strategy is to rotate DMI fungicides during the growing season and to avoid repeated application of the same DMI fungicide. The fungicides Inspire XT and Provysol appeared very closely correlated in CLS cross-resistance testing and thus these two products are not recommended to be used in the same spray program.

	Eminent	Inspire	Proline	Provysol
Eminent	1.00	0.44	0.55	0.34
Inspire	0.44	1.00	0.47	0.83
Proline	0.55	0.47	1.00	0.41
Provysol	0.34	0.83	0.41	1.00

Cross reactivity of various CLS fungicides. Higher values indicate increased risk of cross resistance between fungicides. Lower values indicate lower risk of cross resistance between fungicides.

## 2019 SMBSC Example

In the table to the right is an example taken from the results of the 2019 fungicide resistance field samples. Cody Groen presented this data at the SMBSC Production Seminar in January. The data is from three sampled fields all located within the same township. The numbers are the EC50 value (effective concentration to kill 50% of the spores) of each field. Lower numbers indicate less resistance and higher numbers indicate higher resistance. As you can see, the values differ between each field. If only one of these triazole fungicides is used repeatedly on the field in the season, we have the potential to be choosing the fungicide that has the least effectiveness on the field. For example, if the shareholder for Field 3, chose to use Proline in every triazole application, this would have placed tremendous resistance selection on this important fungicide. Whereas, rotating the triazole (DMI) fungicides throughout the season, decreases risk of fungicide failure as well as managing fungicide resistance.

	Eminent	Inspire	Proline	Provysol
Coop Avg	39	21	53	26
Field 1	90	100	100	100
Field 2	61	8	89	2
Field 3	7	1	100	1

EC50 values of four DMI fungicides in three SMBSC fields in 2019 all located within the same township.

## Triazole Rotation Recommendation

In the interest of maintaining the full utility of our current fungicide options, it is the recommendation of the SMBSC Agricultural Staff that DMI (triazole) fungicides be rotated throughout the spray program. Due to the data generated by Dr. Secor and his team showing the cross-resistance between Inspire and Provysol, SMBSC recommends that these two fungicides not be used during the same season in your field. The DMI (triazole) fungicides have varied pre-harvest restrictions that range from 7-21 days. The potential of an early start to the pre-harvest season will make managing pre-harvest intervals very important. A listing of the preharvest intervals can be found on the SMBSC CLS Quicksheet.

<https://www.smbc.com/Agronomy/QuickRefSheets.aspx>

### References:

V Rivera-Varas, J Neubauer, M Bolton, A Morales-Heilman and G Secor. 2019. Differential intrinsic activity of DMI fungicides. Resistance 19. Rothamsted Research, Harpenden, England. Poster

C. Groen. 2020 SMBSC Production Seminar. Willmar, MN



Contact your Agriculturist with any CLS questions.

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