

Technical Bulletin



Where Minerva Fits In Your Cercospora Leaf Spot Management Program

Cercospora leaf spot (CLS), caused by the fungus *Cercospora beticola*, has been identified as one of the most destructive foliar diseases, resulting in excessive damage of sugarbeet crops. Unfortunately, CLS is becoming resistant to every single mode of action (MOA) / product available to sugarbeet growers today!

The key to preserving the limited tools (fungicides) that growers have to treat CLS, is rotation of these chemistries. University/Agriculturalist recommend growers rotate/alternate the different MOA's. A typical factory recommendation from Southern Minnesota Beet Sugar Cooperative (SMBSC) shows programs within the different MOA's (Figure 1). The "triazole" MOA is listed multiple times; Minerva® is a triazole. Figure 2 shows that SMBSC recommends Minerva as a triazole to be used (other factories and universities do as well).

Fig. 1

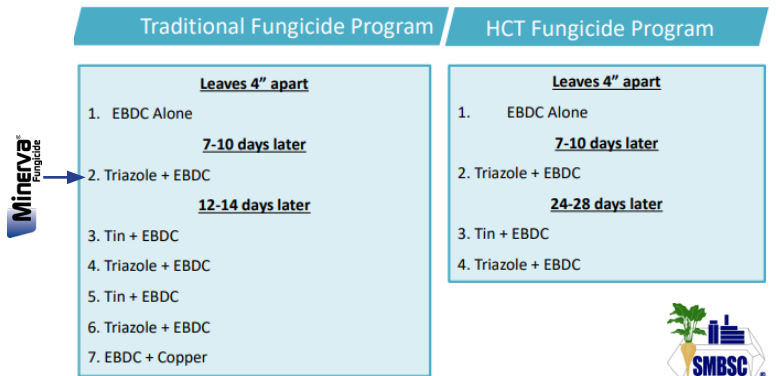


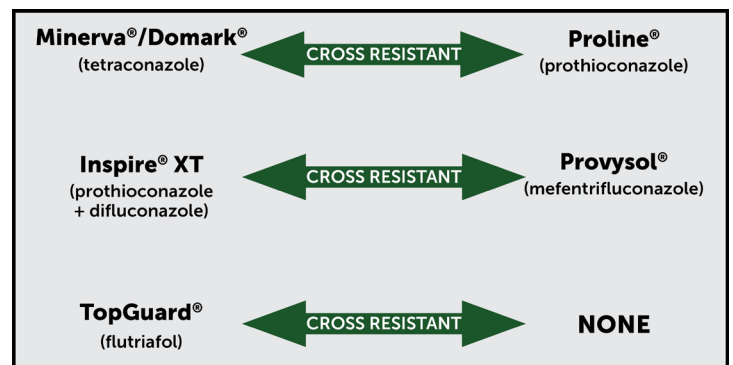
Fig. 2

CLS Fungicide Product Options							
Triazole Products	Rate/Acre	REI	PHI	Tin Products	Rate/Acre	REI	PHI
Domark	6.9 oz	12hrs	14 days	Super Tin 4L	8 oz	48hrs	7 days
Minerva	13 oz	12hrs	14 days	Agri Tin Flowable	8 oz	48hrs	7 days
Proline 480 SC	5.7 oz	12hrs	7 days	*Do not exceed 24 oz/A of Super Tin 4L/Agri Tin Flowable per season.			
Enable 2F	8 oz	12hrs	14 days	Premixed Products	Rate	REI	PHI
Phobos FC	7.6 oz	12hrs	7 days	Veltyma Provisol+Headline	10 oz	12hrs	7 days
Provisol	5 oz	12hrs	7 days	Brixen Minerva+Azoxytrobin	21 oz	12hrs	14 days
Inspire XT	7 oz	12hrs	21 days	Acropolis Minerva+T-Methyl	32 oz	24hrs	21 days
Topguard	14 oz	12hrs	21 days	Lucento Topguard+SDHI	5.5 oz	12hrs	21 days
*Cross resistance has been documented between Proline/Phobos, Minerva/Domark, and Enable products and also between Inspire XT and Provisol. Only use one product from each of these groups in a season.				Delaro Proline+Trifloxystrobin	11 oz	12hrs	21 days
EBDC Products	Rate/Acre	REI	PHI	REGEV Inspire+TTO	8.5 oz	12hrs	7 days
Manzate Max	1.6 qts	24hrs	14 days	*Premixed fungicide products may not contain two effective modes of action (most do not). If these products are used, they should be tank mixed with an EBDC.			
Manzate Pro-Stick	2 lbs	24hrs	14 days	**Be aware of which triazole is in the premix so that we are not applying more than one triazole from a resistance group per season.			
Dithane M45	2 lbs	24hrs	14 days	***Delaro does not contain a full rate of Proline.			
Dithane F-45	1.6 qts	24hrs	14 days	The information contained in this quicksheet is meant to provide options for a CLS fungicide program for your operation in 2024. However, it can not provide all the details for every application. Consult your agriculturalist and the product label.			
Koverall	2 lbs	24hrs	14 days	Updated Jan. 24, 2024			
Penncozeb 80WP	2 lbs	24hrs	14 days	Agricultural Department Southern Minnesota Beet Sugar Cooperative			
Penncozeb 75DF	2 lbs	24hrs	14 days	SMBSC			
*There may be other EBDC products available for use in sugar beets. Follow label instructions.				*There may be other copper products available for use in sugar beets. Follow label instructions. *Do not apply glyphosate within 7 to 10 days of a copper product as this may cause phytotoxicity.			
Copper Products	Rate/Acre	REI	PHI				
Badge SC	2 pts	48hrs	0 day				
Champ 2 Flowable	2 pts	48hrs	0 day				
Cuproxif Ultra	2 lbs	48hrs	0 day				
Kocide 3000	1.25 lbs	48hrs	0 day				

Minerva is a tried and proven, highly systemic triazole to protect existing and newly developing leaves.

How do you chose which triazole to alternate with?

The chart below shows triazole cross-resistance (CR). You should not rotate with a triazole that is CR to the one you previously applied as it may not work well.



Field research has demonstrated it pays + \$360-580/ac to chose Minerva for your first triazole application!