MINN-DAK FARMERS COOPERATIVE

BEET TOPics

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Cercospora Control for 2015...

Why should I have to worry about fungicide resistance?

Fungicide resistance in a Cercospora Leaf Spot (CLS) population becomes important when the number of resistant isolates builds up to be the majority of the overall population and we are flirting with that threshold with several of the chemistries commonly used at Minn-Dak. Typically, the build-up of resistant strains is caused by repeated use of a specific fungicide, which applies what is called “selection pressure” on the entire CLS population.

What exactly is selection pressure?

Selection pressure is what sorts out the “men from the boys,” or in the case of CLS control, the resistant isolates from those that are still susceptible to fungicides. Just like some parents pass along their red hair or blue eyes to their children, each generation of Cercospora spores passes along their own unique traits to their offspring (and since Cercospora only takes anywhere from 10-21 days to complete its lifecycle, this occurs multiple times within a single growing season). If the spores in question are resistant to a specific fungicide, then the genes that control that particular trait are passed on to the next generation. If the spores are susceptible to the fungicide, the same thing happens and the susceptible genes are inherited by the “kids.” With this in mind, when a fungicide is applied to a sugarbeet field that contains both resistant and susceptible Cercospora spores, many of the susceptible spores will be killed off and therefore will not have the ability to pass along their susceptible genes. Since the resistant spores have genes that are unaffected by the fungicide application, they are able to complete their life cycle without any interruption and will pass along these resistant traits. Over time, these resistant spores begin to slowly takeover and eventually make up a majority of the overall population, causing it to “shift” from sensitive to resistant.

Much more than just an ugly leaf...

Did you know that an economic loss occurs when only 3% of the total leaf surface area is infected? CLS not only causes poor sugar and tonnage, but also complicates factory processing by increasing impurity levels and losses during long-term storage

How do we monitor these population shifts?

Each and every year, the Minn-Dak Ag Staff collects sugarbeet leaves infected with Cercospora Leaf Spot (CLS). The spores are extracted and are analyzed by Dr. Gary Secor’s lab (Plant Pathology Department – NDSU) for their level of resistance to some of our most common commercial fungicides. Using several specialized tools and molecular techniques, the data generated from these diseased leaves is used to calculate an EC_{50} value for each individual sample (which is a standardized figure used to measure fungicide resistance). These values are compared from year to year and give the Ag Staff an idea as to what the status of the population is and what type of fungicide program should be implemented to manage fungicide resistance for the current growing season.

2015 Minn-Dak Cercospora Leaf Spot Fungicide Program

One of the most effective management practices to keep fungicide resistance "in check" is to rotate fungicide chemistry classes. Whether you have realized it or not, this chemistry rotation has been the basic template of the Minn-Dak CLS program for the past several seasons and has worked very well to date. But like anything that works well, there is always room for improvement. This year's approach is somewhat unique in that instead of just rotating the order of the chemistry classes from season to season and making a "blanket" recommendation, we will be rotating chemistries within the same season. Our goal is to have the 2nd and 3rd spray (in a >2 spray program) alternate between a triazole-class and a strobilurin-class fungicide. Having both being independently utilized on the same farm during the same timeframe will "throw a curveball" at our current CLS population that it has never seen before and should help lower the selection pressure of each fungicide class. The more diversity from field to field the better the program will work. Both classes of fungicides have a recommended spray interval of 14 days, so the on-farm timing of your applications will be the same regardless of the chemistry rotation you plan to utilize. Work with your Agriculturist for the correct products, rates and timings for this year's program.

Spray Program	1st Application	2nd Application	3rd Application	4th Application
Two-Spray	TPTH + Benzimidazole	Triazole	-------	-------
Three-Spray	TPTH + Benzimidazole	Triazole OR Strobilurin	Triazole OR Strobilurin	-------
Four-Spray	TPTH + Benzimidazole	Triazole OR Strobilurin	Triazole OR Strobilurin	TPTH

Fungicide Class	Trade Name	Rate per acre	Pre-Harvest Interval	Re-Entry Interval
Triazoles	**Eminent**	**13 oz**	**14 Day**	**12 Hours**
	Minerva	**13 oz**	**14 Day**	**12 Hours**
	Proline	**5 oz**	**7 Day**	**12 Hours**
	Inspire XT	**7 oz**	**21 Day**	**12 Hours**
Strobilurins	**Headline**	**9 oz**	**7 Day**	**12 Hours**
	Priaxor	**6.7 oz**	**7 Day**	**12 Hours**
	Gem	**3.5 oz**	**21 Day**	**12 Hours**
Triphenyltin Hydroxide (TPTH)	**AgriTin**	**5 oz**	**7 Day**	**48 Hours**
	Super Tin 80WP	**5 oz**	**7 Day**	**48 Hours**
	AgriTin 4L	**8 oz**	**7 Day**	**48 Hours**
	Super Tin 4L	**8 oz**	**7 Day**	**48 Hours**
Benzimidazoles	**A**	**0.4 lbs**	**21 Day**	**24 Hours**
	B	**10 oz**	**21 Day**	**24 Hours**
	C	**0.5 lbs**	**21 Day**	**24 Hours**

A = Thiophanate-methyl 85 WDG & Incognito 85 WDG
B = Topsin 4.5 FL, T-Methyl E-AG 4.5F, Incognito 4.5F & Cercobin
C = Topsin 70W, Topsin M WSB, T-methyl 70W WSB & T-Methyl E-AG

The product label trumps this information at all times - Always read & follow label instructions

Your Agriculturist is the best source for information regarding CLS - keep in close contact with them for rates & timing