



Cercospora Management for 2021...

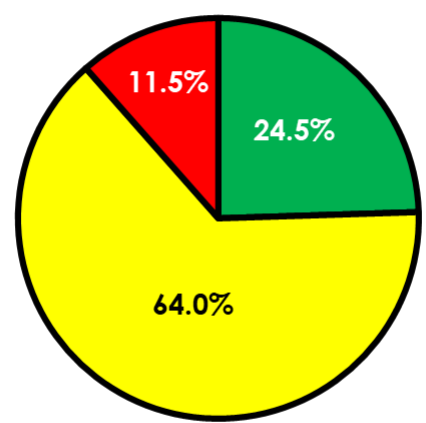
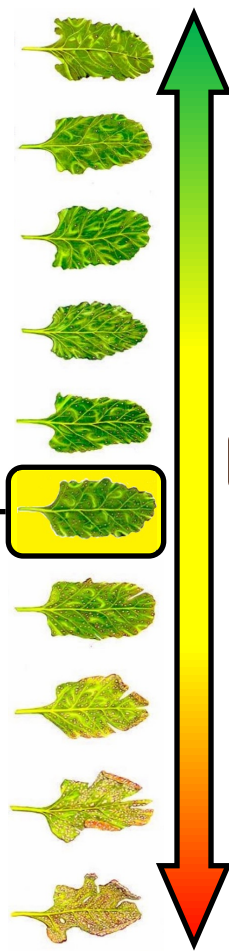
The latter part of the 2020 season was a very quick and unfortunate reminder of just how severe Cercospora Leaf Spot (CLS) can become in very short period of time. This rapid onset of disease severity is why CLS is widely considered to be the most crippling foliar disease of sugarbeet within the Red River Valley. The immense amount of CLS pressure experienced last fall equates to a very large overwintering inoculum load and over the next couple of weeks, these dormant spores will begin another disease cycle. Minn-Dak growers have the right tools at their disposal to keep CLS at bay this season and now more than ever, will need to remain vigilant and stay in close contact with their Agriculturist in order to keep ahead of this devastating disease.

A Little Bit Goes A LONG WAY...

When it comes to CLS, the cliché, “A little bit goes a long way”, couldn’t be more true. Research has shown that a proven economic loss occurs when only 3% of the leaf surface area is covered with lesions (approximately 60-70 spots). When the disease progresses to this point, the result will be reduced tonnage and sugar content, increased impurities and additional losses during long-term storage (both of which complicate processing in the factory).



**3% of Leaf Surface Infected
PROVEN YIELD LOSS**



2020 CLS Ratings

Last September, the Ag Staff gave each of our 919 individual fields a rating based upon their level of CLS severity. Using the scale pictured on the left, a ‘green’ rating was given to fields with good CLS control, ‘yellow’ to those with moderate control (at the level of the economic loss), and ‘red’ to fields the had poor control and were turning brown. Looking the pie chart above it was found that as a whole, the Cooperative had 64% of its fields hovering around the level

of economic loss. The table below indicates the average quality parameters for each of the rating classifications. **Take note how every single quality attribute increases as the level of CLS severity decreases** reinforcing the point that a little bit of CLS goes a LONG way...

Sugar	Purity	RST	RSA
15.9%	88.9%	265	5,689
16.7%	89.6%	282	6,846
17.1%	89.8%	290	7,095

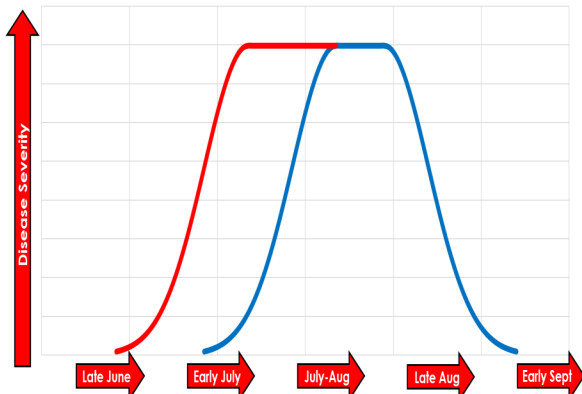
2021 MDFC Traditional Variety Fungicide Program

1. Early EBDC (Mid/Late June)
2. Proline + EBDC (Early July)
3. TPTH + EBDC
4. Provysol or Inspire + Copper
5. TPTH + EBDC
6. Triazole + EBDC
7. TPTH + Copper

Keep all fungicide applications to a 10-12 day spray interval or tighter if rainfall and/or DIVs require

Use the CR+ varieties to your advantage - they offer a lot more flexibility allowing you to focus on your traditional genetics

Start On Time - Stay On Time...



At the end of the 2020 growing season, there was a noticeable difference in CLS control between fields that received an early application of fungicide and those that had a fungicide program that was delayed (it is of note that most of these 'early application' fields can be found in the 'green' classification on the front page). This simple observation again challenges what we have long considered the norm makes us wonder have we always been starting our fungicide program too late?" I would passionately argue - "Yes." Taking a look at the chart to the left, we have typically approached the start of the CLS program with an 'application trigger' being the first, confirmed CLS lesion recovered from a commercial field. This usually occurs sometime in early July and is represented by the blue line. Fungicide applications then coincide with the onset of CLS and eventual increasing disease pressure. But in reality, what is happening is that the latent onset and development of CLS is much more like the red line - occurring in mid-late June and taking anywhere from 5 to 21 days for spots to appear on the leaf. If we wait to apply fungicides like we have in the past, we are giving CLS a two-week head start on disease establishment, immediately putting us behind the eight ball, and causing us to play 'catch-up' for the remainder of the growing season.

To further evaluate the importance of starting your fungicide program early, our research team set up trials this past season to demonstrate what happens when the onset of a fungicide program is delayed. The image on the far left represents three sequential applications (on 14-day intervals) starting early and quitting the end of July. The middle image was the same three treatments but the program's start was delayed until the end of July. The final image on the right represents the standard, full-season 2020 MDFC program which had infection levels well below the economic loss threshold. While both treatments have CLS at levels above economic loss from only three applications, take note how much more severe the infection level is in the late program compared to the early one - Again, once you get behind, you'll never be able to catch up...



Early Program



Late Program



Season-Long Program

CR+ Varieties

For the past two seasons, Minn-Dak has had several varieties from KWS Seeds (marketed independently as the ACH and Betaseed brands) entered into our Official Variety Trials that have contained their new source of CLS tolerance called "CR+." These genetics are truly a 'step-change' in the way Minn-Dak growers will approach CLS control this season. Just shy of 60% of our 2021 acres are planted to varieties that contain this new source of tolerance.

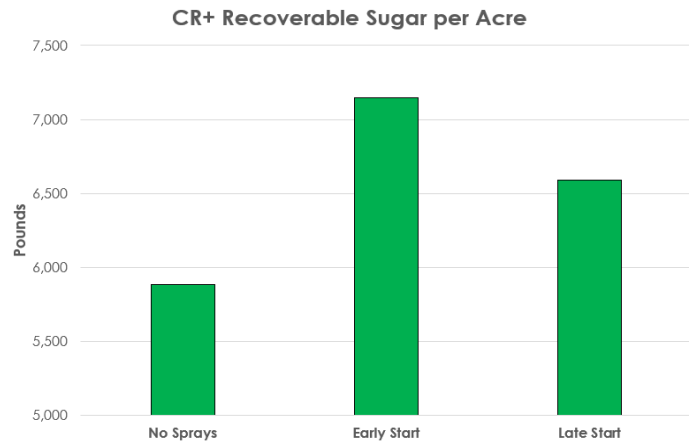
The picture below is from the 2020 MDFC CLS Nursery near Foxhome, MN. These trials are designed in a manner to test the true genetic CLS tolerance of each variety entered into the OVTs. As such, the trial is inoculated with CLS and receives no fungicide applications at any point during the growing season.



Minn-Dak's CLS Nursery

The picture above is almost hard to believe and as such, it naturally begs the question, "With this kind of genetic protection, do I even need to spray these varieties?" This can be answered in the simplest way possible: YES. Although this genetic protection offers an enhanced level of tolerance to CLS, it does not offer immunity to it. The fungus is still able to infect the plant and cause disease, but it is just not able to 'take hold and thrive' like it can on traditional-type varieties.

Research was conducted at MDFC last summer to evaluate various fungicide applications on these new genetics. One of the most important questions we were trying to answer was focused on determining the correct timing(s) of fungicides applied to these trials.



The summary of this particular trial is expressed in the bar chart above with the end result being something we already knew - You cannot play 'catch up' when it comes to CLS.

The highest recoverable sugar per acre (beet quality + tons) in our inoculated field trials came from using CR+ genetics in combination with three early applications of fungicides. Based upon this dataset, starting your fungicide program on time and spacing out your applications after the first couple sprays were applied showed just shy of an \$80 per acre advantage over a three-spray fungicide program whose onset was purposefully delayed until the end of July. Just like the traditional genetics, CR+ cannot play catch up when it comes to CLS. This data is the basis for our 'one, two, skip a few...' fungicide recommendation for varieties with CR+ tolerance on board.

2021 MDFC CR+ Fungicide Program

1. **Early EBDC (Mid/Late June)**
2. **Proline + EBDC (Early July)**
3. **Skip**
4. **TPTH + EBDC**
5. **Skip**
6. **Provysol or Inspire + Copper or EBDC**

Keep in close contact with your Agriculturist regarding program onset and proper application intervals

Odds & Ends to Make Your CLS Program More Effective...

- **Start your program on time** and stay on schedule.
- **Keep your spray intervals tight** - everything in this year's program should be kept to a 10-12 day interval (unless you are utilizing a CR+ variety). Utilize the reminder feature in your smartphone - it's a handy tool to help stay on schedule!
- **Watch the NDAWN Daily Infection Values (DIVs).** These color-coded ratings can be found on the MDFC website or within the MDFC mobile app.
- **Use the correct nozzles.** The same nozzles you utilize for glyphosate applications are generally not the best for fungicide use (small vs large droplet size). Generally speaking, your target for fungicide applications should be around a medium droplet size (250 to 350 microns).
- **High water volumes.** Many of the tank-mix partners are protectants and require a little more water than you'd normally like to use. Water is the cheapest thing you put into your spray tank; there should be no reason to cut back on it. Ground applications should target 20 GPA and aerial applications no less than 5 GPA.
- **Do not mix fungicides with glyphosate.** The main reason is the amount of water required with each application. CLS fungicide performance is best when applied with small droplets at high water volumes (20 GPA). Glyphosate is just the opposite as it has better performance when applied in larger droplets (pile effect) and lower water volumes (5-15 GPA). They are two completely different approaches to maximize the control offered by each type of product. You are money ahead making separate applications to achieve the needed weed and CLS control rather than making one single application and getting mediocre control of each.
- **Be wary of 'miracle-type' adjuvants.** Please keep in mind that if there was a 'silver bullet' that could be added to the tank to significantly increase CLS control we would be recommending it. Invest your money where you know it will return dividends - increased water volumes, tighter spray intervals, full rates, etc.
- **Use an aerial applicator if needed.** If rain/wet ground is prohibiting you from staying on your spray schedule, call in the 'Air Force.' You are money ahead by staying on schedule - once you get behind the eight-ball of CLS pressure, it's almost impossible to catch up.
- **Don't give up on the dry formulations.** They will give you little to no trouble if handled & mixed correctly. When in doubt, follow the A.P.P.L.E.S. recommended by NDSU Weed Science:
 - ⇒ **Agitate**
 - ⇒ **Powders soluble (SG, SP)**
 - ⇒ **Powders dry (DF, WDG, WP)**
 - ⇒ **Liquid flowables & suspensions (ASC, F, ME, SC, SE)**
 - ⇒ **Emulsifiable concentrates (EC, EW, OD)**
 - ⇒ **Solutions (S, SL)**

Make sure that each product is uniformly mixed in the tank before adding another...

Warm water will also help dissolve each product into solution. Leaving dark-colored bulk tanks filled with water out in the sun a few days before spraying will make a world of difference.
- **There is a pecking order when it comes to the Copper fungicides.** Cu-Hydroxide and Cu-Oxychloride formulations are most effective (i.e. Badge, Kocide, Champ, etc.), whereas products containing Cu-Sulfate (Cuprifix Ultra, MasterCop, etc.) do not perform as well in our research trials.
- **Pay attention to Harvest Intervals.** Pay close attention to the PHI of each product you pour into the spray tank - it will likely have an impact if we have an August start.
- **Listen to your Agriculturist.** They are the best source for information regarding CLS - keep in close contact with them regarding products, rates & timing.

2021 Fungicide Quicksheet

TPTH	Rate/Acre	Pre-Harvest Interval	Reentry Interval
Dry	5 oz	7 Days MN / 21 Days ND	48 Hours
Liquid	8 oz	7 Days in Both States	48 Hours

Agri Tin, Agri Tin Flowable, Super Tin 4L, Super Tin 80WP

Copper	Rate/Acre	Pre-Harvest Interval	Reentry Interval
Dry	2 lbs.	0 Days	48 Hours
Liquid	2 pts.	0 Days	48 Hours

Badge SC / X2, Champ Formula 2 / WG / DP, ChampION, Kocide 4.5 LF / 2000 / 3000

EBDC	Rate/Acre	Pre-Harvest Interval	Reentry Interval
Dry	2 lbs.	14 Days	24 Hours
Liquid	1.6 qts.	14 Days	24 Hours

Dithane DF / F-45 / M-45, Koverall, Manex II, Manzate Max / Pro-Stick, Penncozeb 75DF / 80WP

Triazoles	Rate/Acre	Pre-Harvest Interval	Reentry Interval
Provysol	4 oz	7 Days	12 Hours
Inspire XT	7 oz	21 Days	12 Hours
Proline	5.7 oz	7 Days	12 Hours
Eminent / Minerva	13 oz	14 Days	12 Hours
Minerva Duo	16 oz	14 Days	48 Hours

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