

Protection + Performance:

How an Industry-Leading Research Operation Led KWS to a Cercospora-Tolerant Sugarbeet Seed Trait



Mark Schmidt, VP of Sales



Kevin Etzler, Foxhome, MN

As fungicide resistance increases, sugarbeet growers are looking for answers. A new disease-tolerant trait promises relief — coupled with excellent yield performance.

“Practically overnight, every sugarbeet field in our region turned into a sea of brown,” recalls farmer Kevin Etzler from Foxhome, Minnesota, “One of our main classes of fungicides just stopped working.”

The year was 2016. The culprit was Cercospora Leaf Spot (CLS), a disease that impacts leaf health, adding brown

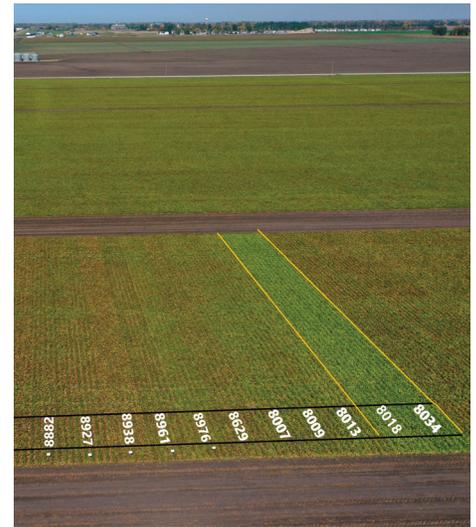
spots to otherwise healthy plants, short-circuiting sugar production and significantly cutting sugar yields.

Though the disease had been held in check for years by the application of an array of fungicides, the brown fields of 2016 represented a major change. They foreshadowed not only a poor harvest in the fall, but also the latest escalation in the struggle between growers and plant disease.

Four years later, that battle rages on.

Etzler says that, with the help of extensive research conducted by MinnDak Farmers Cooperative, growers adapted after 2016, pivoting to different fungicide options to help control CLS. These have offered mixed results in the near term, but recently Etzler says their efficacy is fading:

“Effectiveness of our spray programs decreases each year. We are now dropping everything to spray beets every two weeks in the summer. It is exhausting and expensive — something has to change.”



Glyndon, MN Strip Trial
CR+ tolerant varieties on the right

Change is indeed coming.

In October, global seed company KWS announced a new innovation for growers like Etzler who are struggling with Cercospora control. Their new ally is a genetic sugarbeet trait developed to allow plants to not only tolerate the disease, but to also deliver strong yields while doing so. It's truly a once-in-a-generation breakthrough, born in part through research completed in Etzler's home state of Minnesota.

The new trait to be licensed to seed providers is called CR+ and represents the culmination of a 20-year effort by KWS. It is the result of a project led by a team that included the firm's director of sugarbeet breeding, Margaret Rekoske.

Rekoske says that the major impact of the CR+ trait isn't solely its tolerance to CLS, but also its unique ability to combine that tolerance with strong yields:

“CLS-tolerant hybrids have existed for years. The issue has been that those

A revolution in Cercospora management.

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KWS

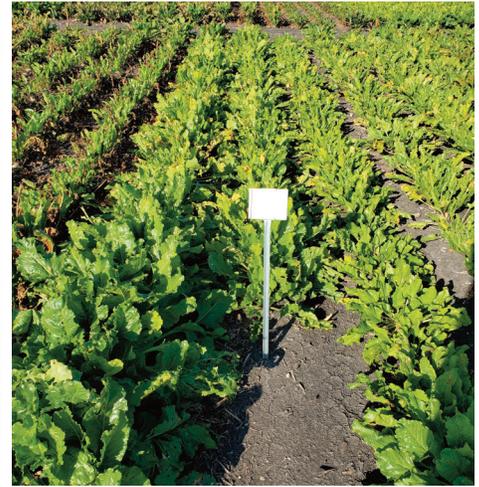
Cercospora Protection + Yield Performance



Minnesota CR+ Test Plot (08/21/20)



Minnesota CR+ Test Plot (09/04/20)



Minnesota CR+ Test Plot (09/18/20)

varieties sometimes came with an impact to yields. CR+ is a game changer — delivering yields that truly redefine that trade-off.”

Rekoske says the drag on yields seen with previous CLS solutions was troubling because yield differences were worse in years when CLS wasn’t present at all. This placed farmers in an unusual position, trying to predict how widespread CLS might be when ordering seed in the fall.

So instead, Rekoske and the team at KWS decided to attack the problem in a different way.

“The key is genetics. CR+ is revolutionary because it delivers CLS-tolerant varieties that perform well with or without the disease presence due to superior traits bred into every variety,” says Rekoske.

The breakthrough follows a winding path that spanned two decades, beginning in 1999. The first step was an exhaustive search through related genetic resources for a tolerant trait that could be crossbred. This was followed by the KWS team combing through hundreds of thousands of individual plants seeking the genetics needed. Once candidates were identified, researchers worked to isolate the trait, develop adapted parents, breed and test.

Rekoske says the process involved molecular analysis, fieldwork and data

analysis along with outside feedback and market direction. It was truly a team effort to define, refine, crossbreed and multiply the trait. This was followed by nursery evaluation and performance testing.

“This is really a strong example of teamwork, testing and communication,” says Rekoske. “It involved the alignment of KWS research and sales teams with industry groups, cooperatives and growers who provided a valuable feedback loop.”

That feedback loop includes Etzler, who for years has provided the land to evaluate fungicides and genetics for the MinnDak and American Crystal cooperatives who work closely with NDSU and KWS.

He says his motivation is simple:

“We currently run a six-spray program for CLS at 15 to 30 bucks an acre per application. That’s unsustainable. We need an alternative, and clearly, genetic tolerance will need to shoulder more of the burden in the future — I was excited to help.”

The strip trials offered Etzler a front-row seat to observe CR+, including plots where hybrids containing the new trait were tested alongside a control group. He says results have been more than promising, calling what he’s seen so far in the trials “amazing”:

“There is a very visible difference

between the CR+ plots and the control group — you just sit and go wow!”

While Etzler has yet to see the final results of the trials, he is confident CR+ will be a fundamental shift for managing CLS in the Minn-Dak Farmers Cooperative market — a shift that was 20 years in the making.

Just don’t mention that 20-year timeline to Rekoske:

“While it’s true our project has been running since 1999, this did not begin or end with our project. Cercospora tolerance has been a breeding goal since the advent of sugarbeet farming. The work started long before my career began and the effort will continue as long as there is a need.”

The release of CR+ represents the latest development in a long line of innovative sugarbeet solutions from KWS. The global seed developer also took a lead role in developing Roundup Ready varieties and is leading the effort to create the next-generation herbicide-tolerant trait. That work continues, with a launch date expected in the next 5-6 years.

Adding the plus level of CLS tolerance to that track record through the CR+ trait is a significant development. It’s one that was a long time coming but promises to help growers like Etzler finally regain the upper hand — a notion that seemed a long way off back in 2016.