Farmers Must Know Their Fields, Disease Treatments

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Know your field history, know what material you're putting out there, know what your corn or soybean hybrid variety is and integrate your fungicide program from there. That's the advice of Dr. Paul Esker, assistant professor, extension plant pathologist for the University of Wisconsin.

Esker spoke on understanding risk factors that drive response of foliar fungicide applications in field crops at the recent Crop Management Conference.

"I've been doing a lot of research on both a local scale in Wisconsin as well as cooperating in a regional scale throughout the states of Iowa, Illinois and Ohio," he said. "We're asking 'if we spray a fungicide what's the likely return on investment, what are we targeting, and in what environments may we see a response accordingly?'"

He and colleagues just completed a four-state survey of certified crop advisers and corn growers. Much of that survey was based on questions that have been percolating the past five years.

"Almost retroactive, we're trying to argue what the results mean backwards," he said. "We have to move forward with our decisions and the only way I think we can do that is to draw in money. At the end of the day, the economics drives a decision."

In the Wisconsin trials, grower production practices were studied, with farmers setting up randomized replicated trials. With strong foundational county extension help, the logistics of these trials were put together.

Dr. Paul Esker, Assistant Professor, Extension Plant Pathologist for the University of Wisconsin, discussed foliar fungicide applications in field crops.

Photo by John LaRose, Jr.

"So many people go to an extension meeting, and see statistics then try to interpret what is presented, like the P-value," he said. "The interpretation that they really need is an opposite question. We've seen a positive or negative response, so what's the probability that such a response is bigger than some defining threshold? From this, we are able to integrate the economics. For example, in the spring the cash market price for corn was $3.50, then a short time later it was $5 higher in some areas. So we try to integrate those economics and say, 'given what we've seen in the trials, what's the probability that that result was greater than some predefined value?"

With that approach the trials show the probability of a return is actually quite low against the break-even points; when the return was four, five to eight bushels per acre, the probability that a fungicide treatment paid for itself was under 15-30 percent.

"We also do small plot work or large scale strip trial, which leads to questions about plot size and our results. In Wisconsin, large strips are a lot more variable compared to wide open spaces; but our strips are still hundreds of feet in length, and we don't see any differences when comparing different plot sizes. What we see is just a lot of variation in the response.

"Whether that's attributed to other factors – soil, fertility or other cropping practices – when we try to do just an overall analysis, the largest source of variation is what we would term the 'farm scale,' which means there are a lot of other factors that influence any of these decisions at the moment. So trying to wharf through the economics is not easy, because every time I talk there are the anecdotal comments. 'I see this on my farm,' someone will say; but that goes back to that source of variation in the equation."

Recognizing this was primarily a Wisconsin example, Esker integrated some of the regional results that he coordinates with the states of Iowa, Illinois and Ohio. In those states there is either some similar practice with locally adapted material; or, a new study that just started this year where all use the same hybrids. That presents it's own challenge from the geographic distribution ranging from Iowa to Ohio and then through the middle of Wisconsin.

"What we've seen in those trials is our best results come on grey leaf spot of corn; the risk of grey leaf spot is the highest. We've seen this response come up in the Illinois trials in particular, fairly consistently, over the past couple of years where there has been a statistical advantage for applying fungicides. I do think economically it does start to show up as potentially meaningful; but again, referring to a larger geographic region, it's so difficult. That's why we have that new trial so we can nail down some of the thresholds we have to target to recommend these products."

Esker also then talked about different field crops including soybeans and looked at what is shown in the trials. Many questions have surfaced in Wisconsin about tank mixing insecticides and fungicides where soybean aphid is a problem.

"Plain and simple, our recommendation is that's a bad idea for a variety of reasons; in particular, some of the data in the last couple of years shows either a response to the insecticides' inhibitive pressures at the level it needs to be to trigger an application, or as seen in 2010 with more favorable weather conditions for disease development, the fungicide may be driving the responses more. We have seen control of Septoria brown spot the past few years but it hasn't always translated to yield," he said.

In 2009 when conditions were cool, white mold was a problem in several states, so there was a renewed interest in fungicides. So Esker did a lot of experimental screening.

"The results have been variable, but one result people recognized last year was there was some efficacy in one trial with Cobra; so we put the herbicide Cobra back in the trial in 2010," he said. "It does have white mold on its label and we found, in good growing conditions, there was a lower risk of white mold when using Cobra. We also saw a yield penalty for spraying Cobra in 2010. It was fairly substantial in two trials in Wisconsin. We were averaging 65 to 70 plus bushels in the trial, and we were down 10 to 20 bushels with Cobra, so I call it the high risk to reward management option. I think in terms of white mold our best approach is still working on variety resistance or field tolerance."

Esker said there's a lot of misinformation is out there and farmers need to be a little more proactive in fighting fungal disease. While farmers haven't used fungicide much, haven't had to use much, they question whether they need to use it going ahead.

"Right now I still think the answer is variable across the region. Disease control is still the number one key and for this, hybrid or variety selection is the primary factor that should be considered initially," he said.

Esker summed his message by focusing on stewardship.

"I tried to emphasize some of the resistance concerns starting to pop up, fungicide use shot up in the north central region," he said. "In fact in the United States it's been on a larger scale."

He urged being good stewards noting there's not a lot of products out there.

"I deal with corn, soybean, wheat, and forages, and there is a lot of overlap in these products and that's probably the other take home message: Farmers need to get acquainted with which fungicide is best for a specific disease control. Proper use is critical of any management tactic, especially a fungicide." Δ

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