Select Varieties, Hybrids For Overall Performance

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Measuring performance and responses to irrigation of different corn hybrids and soybean varieties across different environments was the subject of a presentation entitled "Choosing Corn Hybrids and Soybean Varieties Best Suited for Irrigation in Tennessee. The information was derived from variety trial research conducted by Richard Johnson and Dr. Fred Allen of the University of Tennessee.

Working with Dr. Fred Allen on the variety trials was Richard Johnson, Research Associate II. They wanted to answer several questions on "Choosing Corn Hybrids Best Suited for Irrigation in Tennessee".

Photo by John LaRose, Jr.

"We wanted to answer two questions," Johnson said. "The first was: Do corn hybrids and soybean varieties differ in their response to irrigation? According to prior research, the average yield increase for corn under irrigation is 40 to 50 bushels per acre; for soybeans the average increase is 15 to 25 bushel per acre. We wanted to find out if some hybrids and varieties differ more than that. Does everything respond about the same or are there some varieties and hybrids that respond more to irrigation than others? The second question was: How can that information be used by producers to select varieties and hybrids for the highest yields and best returns under irrigation?"

"What our research has shown is that if we look at varieties that are the top performing under irrigation, those also tend to be the ones that have the largest response to irrigation," he said. "In other words, hybrids and varieties which responded the most in yield increase due to irrigation tended to be the top performing lines in the irrigated trials. If we looked at the top third of the trial under irrigation, the hybrids and varieties that yielded in the top third had a higher response, (put on more yield per acre due to irrigation), than the mid-third or lower-third."

There are exceptions to that. That's a trend, but that's not a hard and fast rule.

"We do find some hybrids and varieties that have a fairly low yield overall," he explained. "They don't handle stress very well under non-irrigation. It is possible to have a hybrid or variety that is so low yielding in a dryland environment that even though it responds very well to irrigation, it still ends up in the lower third of the test rankings, even under irrigation. Those hybrids and varieties might have a large response to irrigation, but they're not going to yield in that top group, so those may not be the best lines for you to use."

Therefore, irrigation response alone isn't necessarily a good way to choose a variety. So given all that, what is the best way to choose a line for an irrigated field?

"Response is an indication, it's a trend, but it's not a certainty," Johnson continued. "We could also just look at the data from irrigated locations and try to pick the top yielding lines under irrigation."

The key is to pick a hybrid or variety that performs well in both overall yield across environments and under irrigation. This information is available in the University of Tennessee Variety Testing publications, which ranks performance in overall yield from top to bottom.

"Start with hybrids and varieties that rank high in overall yield across locations and then look at the irrigated yields and find the ones that did very well under irrigation as well – it will usually be the same ones," he summed. "Those are the best ones to pick for irrigated fields."

One caveat is that there may be some hybrids and varieties that yield high under irrigation but that didn't necessarily do very well overall. They may be in the lower third of the overall test under non-irrigation, even low ranked in the overall average across all locations. However, those may still do well under irrigation.

"The risk with choosing these are, what happens if your irrigation system goes down, if the well goes dry? You'd much rather pick a hybrid or variety that has done well, not only under irrigation but across locations and in non-irrigated environments as well, so you have some safety net," he said. "Some people talk about performance hybrids verses workhorse hybrids and it's not really an either/or case. You can pick varieties that do well in stress environments but do very well in the irrigated and high management environments also."

Johnson and Allen work with the University of Tennessee Variety Testing Program. Their main responsibility is to produce the Variety Testing/Crop Performance publications that many area producers are familiar with in printed and online versions. Data for these trials can be found at: http://varietytrials.tennessee.edu/. Δ

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