The **Search** For A **Yield Bump**

Studies Focus On Increasing Soybean Yields In Illinois

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Increasing soybean yields has claimed a lot of interest recently, due in part to the results of Kip Cullers who proved that extremely high soybean yields are possible. Robert Bellm, University of Illinois Extension crop systems educator, addressed the subject recently.

Bellm also summarized some of the university research underway in Illinois on planting dates, planting rates, row spacing and others. He explained how these management practices have affected soybean yields.

"For the most part, we're not seeing significant increases in yields from any of those inputs," he said. "So there's probably not a magic bullet that growers can implement to produce high yields. Yield increases are going to come from a combination of factors. In any given year weather, primarily rainfall, is going to have a significant effect on yield potential. In addition, having deep fertile soil with good internal drainage is conducive to high yields.

"It has been a real challenge to try to duplicate some of the yields that have been obtained elsewhere in soybean," he said. "Narrowing your row spacing will increase yield, but you don't have to be planting in seven-inch drill spacing. A row spacing of 20" or less will normally out yield 30" row spacing."

"The soybean plant normally produces more flowers than will form pods and stay on the plant all the way to harvest. It will abort the excess," he added. "Somehow Cullers is getting those flowers pollinated and holding them. Now whether that's through his irrigation program, or any of the other inputs applied, I don't know."

Still, researchers are studying ways to improve soybean yields.

"We're looking at varieties, and we're looking at some of the similar types of inputs that Cullers uses," Bellm said. "We really don't know exactly all that he is doing, or how his practices may be interacting."

"Most research at universities would be what I would call 'reduction research,' where you would minimize variability and you look one management practice at a time, or maybe at the most two or three practices at a time, and analyze them statistically," he explained. "Then you could say 'that's what's giving me the change that I'm observing.' In the case of these other types of demonstrations, where a whole slew of different management practices are being implemented at once, you have no idea which input, or what interactions between inputs, are providing the results you obtain. You just don't know. I would suspect a hundred other growers, implementing his exact same program on their farms, wouldn't duplicate Culler's results."

Bellm also addressed soil fertility and summarized the results of a state wide soil fertility survey that looked at pH, phosphorus and potash levels around the state. He discussed how the survey's results may affect the fertilizer rates that farmers need to apply.

"Overall we found that phosphorus levels in the fields we sampled were higher than the optimum necessary for crop production; in fact a large percentage of those fields don't need phosphorus fertilizer applications for several years," he said. "So we have done a good job of building up phosphorus levels."

"Potassium is a little different story, especially in southern Illinois," Bellm added. "The majority of our fields are below what we consider the critical level for potassium and we need to look at bringing that up, especially since low potassium levels will negatively affect soybean yield."

Weed resistance to glyphosate, primarily waterhemp, also claimed some attention.

"On the herbicide resistance issue with waterhemp, growers have focused on a glyphosate-based weed control program in soybeans for many years. Now we have stacked-trait corn hybrids and the ability to put glyphosate on corn also," he said. "The potential for resistance development is increased. We've got at least three documented locations of glyphosate resistant waterhemp populations in the state right now. It's widely separated, so it's not a population that spread from a single point. Independent developments of glyphosate resistance have been seen, and they now have a documented case, not in this part of the state, of a four-way resistant waterhemp – a biotype with resistance to the triazine herbicides, the ALS herbicides, the PPO herbicides as well as glyphosate.

"Increasing Soybean Yields Are Possible" **Robert Bellm, University of Illinois Extension crop systems educator summarizes some university research underway in Illinois.** Photo by John LaRose, Jr.

While this four-way resistant biotype doesn't constitute a large number of acres, just the fact that it exists is troubling.

"Researchers were deliberately attempting to produce a similar biotype in the lab, using a three-way resistant waterhemp biotype from Illinois and crossing it with a glyphosate resistant waterhemp biotype out of Missouri," Bellm continued. "They were able to do that in the greenhouse, and then found out that nature had already done it out in the field."

Bellm's take home message to maximize soybean yield is to select the highest yielding, disease resistant, adapted variety you can for your area, and plant it in a timely manner in late April or the first week of May.

"You can't raise high yielding soybeans when the weather doesn't let you plant until the 15th of June," he said.

On weed resistance, he urged farmers to realize that resistance is happening, and that it needs to be monitored on all the farms throughout the state.

"It doesn't happen overnight, but it can and will happen if farmers limit themselves to one particular weed control practice," he said.

"On soil fertility, my take home message is simple. Soil test regularly to know what's happening in your fields, and fertilize accordingly for optimum crop production." Δ

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