

Seeding Experiments

On-Farm Trials Can Help Decide Population Levels

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The principles of understanding how to decide populations and row width of corn were outlined recently by Dr. Bob Nielsen, Purdue University extension agronomist, who works primarily with corn.

“Given that I’m five hours away from the Belleville, Ill., area, I have to be careful about talking about recommendations for farmers

dealing with smaller hybrids so they respond better to seeding rates.”

Most of Nielsen’s research is it done on non irrigated soils because the majority of Indiana corn production is not irrigated. Also, most of the Purdue research farms are not irrigated. A couple do, but they are only used in an emergency.

“The research that has been done farther west, or really anywhere there’s irrigation shows that the optimum seeding rates for a well irri-

Photo by John LaRose

Dr. Bob Nielsen is shown in front of a twin row corn field planted 38,000 seeds per acre. He encourages farmers to do on-farm trials to find the best population for their property.



back in Indiana, so I really spend more time on principles and the understanding of how you make these decisions,” he explained. “For both of these choices a lot of the answers come from managing the crop canopy.”

He showed slides of corn planted in recent weeks and said this is not the stage to talk about crop canopy. However, a second slide of the taller corn shows it’s at a point where crop canopy can be considered. Particularly he discussed row spacing.

“What we know about row spacing and its effect on yield is you will get a yield response if narrower rows increase the crop canopy to let you harvest more light,” he said. “If your current system harvests all the light there is and you go to narrow rows you probably won’t see a yield response. That’s how we think about it in the central corn belt areas, so we end up concluding that narrow rows ironically tend to do better on the more challenging soils.”

He explained by saying the more challenging soils often don’t build as good of a canopy with normal production. So going to narrow rows might increase the crop canopy significantly, capture more sunlight and therefore increase yield.

“Population is the same story in a way because part of what we’re doing by increasing seeding rate is build a bigger crop canopy,” Nielsen said. “Of course the other thing we’re trying to do is put more ears per acre out there, but when we put out more and more plants per acre to get those ears we also know there’s a tipping point where the ears start to shrink. So there’s that balancing act to find the little magic place where you get enough benefit from more ears per acre without losing much on ear size. Of course, that depends a lot on the growing conditions and the available water in particular.”

He also spoke about competition and the changes in population needed for the different areas of the central corn belt. Some areas it’s the low 30,000s, other areas it may be lower than 30,000.

“In the western corn belt where water can be an issue and it dries out in late summer, if you have shallow soils, maybe not enough rain in mid-summer, maybe there’s challenging soils with clay pans and just hard to manage, they’re probably not going to respond to as high a seeding rate as we can do farther north; up north into Wisconsin/Michigan, these optimum seeding rates get even higher partly because they’re

gated situation is very similar to what you would see in a nice rain-fed condition in Indiana or Illinois,” he explained. “Again we’re talking low 30s for a well irrigated system. For non irrigated, challenging soils, maybe droughty soils then maybe final stands should be no higher than the mid 20s.”

So the results on premium soils are not the same as on challenging soils. There’s no need to increase the seeding rates on challenging soils.

“Right, in fact it can be detrimental on these challenging soils; particularly, where water is a limiting factor, it can be detrimental to try and push the seeding rates up into the 30s like we can do in well rain-fed areas.”

One thing to consider with seeding rates is the mind set that has changed over the years.

“When a lot of us grew up we wanted half pound ears or bigger and that’s what was often talked about as being necessary for optimum yield,” he recalled. “However, the breeders have done such a tremendous job in the past 20 years of improving the tolerance of these hybrids to high populations to the extent that ear size doesn’t shrink as easily as we push these populations up today as they did years ago. However, as we push these populations up now to the levels that they need to be, the ears still get smaller and that’s where a lot of growers get uncomfortable. They get concerned, but again it’s this balancing act. We’re trying to get more ears per acres to maximize yield without sacrificing too much on ear size and so there’s that delicate balance. We wonder where that tipping point is, and, honestly, the only way to develop confidence in the seeding rates for your farm is to do some seeding rate trials every year. In fact, I would encourage not only doing it yourself, but encourage some neighbors to do the same thing and pool that data together. It really needs to be based on yield response to those seeding rates, soil types and environment.”

With today’s technologies, with yield monitors and even variable rate seeding control, doing these kinds of strip trials is very, very easy and they can provide a lot of data.

“So I always encourage folks to get involved with on-farm trials looking at these simple questions like that, because that develops your confidence in knowing that ‘okay I can be at 30,000’ or ‘no, I need to hang around 24,000-25,000’ based on my own yield data,” he concluded. Δ

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