

Match Nutrient Management to Local Soil Resources



By Barb Baylor Anderson, Special to FarmWeekNow.com, Sep. 14, 2021

Farmers in western Illinois have soils well suited for corn and soybean production. And based on information shared during the Warren-Henderson Farm Bureau Nutrient Stewardship Field Day, Aug. 26, farmers also have new local research results to make the most of that resource.

Illinois Farm Bureau (IFB) partnered with Warren-Henderson Farm Bureau and University of Illinois Extension during the 2019, 2020 and 2021 growing seasons to evaluate nitrogen use in strip-till corn in a field near Kirkwood. The objective is to compare four sources and four rates of nitrogen applications and do a simple economic comparison to identify the most sustainable choice for profitability. The partnership is funded by an IFB Nutrient Stewardship Grant.

“There is strength in grassroots efforts such as these where we can leverage the local structure to tailor solutions to geographic areas and make results work for all Illinois farmers,” said Austin Omer, IFB associate director of natural resource policy.

Site host farmer Jacob Baker reported the optimal rate for all nitrogen sources turned out to be 200 pounds per acre in 2019 and in the 170-200 pounds per acre range in 2020, in line with Maximum Return to Nitrogen (MRTN) recommendations using the corn nitrogen rate calculator.

“In 2020, anhydrous ammonia and UAN solution (urea ammonium nitrate) were cheaper than in 2019. With greater yields, that resulted in higher profits,” said Baker. “But greater yields do not always mean greater profits. We learned the right N source and rate are what is most profitable, depending on the nitrogen source price. Next, we need to look at plant health to better understand nitrogen uptake efficiency, including adding sulfur, fungicide, micronutrients and more.”

Baker’s test plot this year is planted to soybeans, and he is looking at four different management strips:

1. The soybean control
2. A strip with only cereal rye planted as a cover crop
3. A strip with 32% UAN applied at the R3 growth stage

4. A strip with cereal rye plus 32% UAN at R3

The goal is to measure yield and see if the cereal rye provides enough nitrogen to the soybeans, so no nitrogen application is needed.

In addition to nitrogen tips, local farmers at the field day learned phosphorus (P) is not a nutrient in short supply in the region. Andrew Margenot, assistant professor with the University of Illinois Department of Crop Sciences, noted some of the best crop soils in Illinois are in the western area because of the depth of its loess. He referred to loess as an “injection of fertility.”

“We are studying subsoil P supply power to determine if state recommendations for P applications should be revised based on the amount of P that can be derived from below the soil surface,” he said. “Legacy phosphorus in the soil also is present – P that was applied years ago and is still there because it is not mobile. Most P entering water today is from streambank erosion and we must account for that, but it is not coming from overapplication on farms.”

A farmer panel shared perspectives on adding cover crops into their corn and soybean rotations to not only better manage nutrients in the soil, but to combat soil erosion. Panelists recommended cereal rye as a good starting point for beginners. Other crops can be added to increase biodiversity. While panelists have tried aerial planting and other methods, they agreed planting cover crops immediately after harvest using a seeder with a vertical tillage bar is best.

Brian Corkill, farmer from Galva, has been using cover crops for a decade in his corn and soybean system for erosion control and compaction mitigation.

“As I have learned more, I also now rely on cover crops to improve nutrient management and soil health. I went from rye grass to cereal rye and then worked in radishes, rapeseed, oats, turnips and winter barley for diversity,” he said. “I plant the corn or soybeans in the spring into the living green cover crop and then terminate that cover with glyphosate.”

Corkill received Conservation Stewardship Program funding to initially help pay for the cover crop seed as well as some of his equipment needs.

“Cover crops are one of the most useful ways for farmers to slow nutrient loss, avoid losing money and build soil health,” said Stacy Zuber, Illinois Natural Resources Conservation Service (NRCS) soil health specialist. “Cover crops really fit the bill for most productive soils.”

Zuber urged farmers to contact local NRCS or Soil and Water Conservation District offices to learn how to obtain cost-share dollars to help implement cover crop practices.

To read more about IFB’s nutrient stewardship field days, visit www.ilfb.org/fielddays.



Dr. Andrew Margenot, Assistant Professor in the Department of Crop Sciences at the University of Illinois College of ACES, spoke about phosphorus research at W-HFB's field day on August 26th.



IL NRCS Soil Health Specialist Stacy Zuber performed a soil comparison demonstration and talked about the benefits of cover crops in helping to build soil health at W-HFB's field day outside Monmouth in late August.