



Kansas State University

Thinking About Nitrogen Use Efficiency

NUE - Nitrogen Use Efficiency. Simply, it's efficient use of N fertilizer. Attaining that efficiency with application, weather, product, and timing variables can be more complicated!!

One thing that makes attaining optimum NUE a challenge is the multitude of information available to producers as to what the optimum N rate should be. We hear figures like 1 - 1.2 pounds of N needed to produce a bushel of corn. If you refer to KSU's Soil Test Interpretations and Fertilizer Recommendations (MF-2586) publication, you'll actually see our N rate equation start with 1.6 times the yield goal! Which is correct? Maybe both!

Looking at a required level of N per bushel of yield is OK, but it may not account for some things. In actuality, you may get by with .8-.9 or less lb. N/bushel following soybeans and 1.0-1.2 lb. N/bushel or less following corn. Still, there's no way to be sure unless you have an accurate yield goal - and know what other factors are playing in to the recommendation.

Take soil N for instance. How much credit do you give to organic matter - and what IS your organic matter level? For Kansas soils, we ASSUME two percent organic matter, and for summer crops (corn...), give 20 pounds of N credit per percent organic matter. If your organic matter is 2.5%, that's an extra 10 pounds of N you have available above our assumption.

Profile N is another source. Twenty four inch deep profile N samples are NOT fun to pull, but we have to sample deeper to get at the N in the profile (its mobile - it moves). If we don't sample, we make another assumption - 30#/A N credit from profile N. That's roughly 4.2 ppm using KSU's formula. If your actual profile N (again, not the nitrate we find in a 0-6 sample) is 10, it gives you a pretty good N boost! As a reference, two corn fertility trials in NEK during the summer of 2011 were tested for profile N prior to planting. One had 9.9 ppm (71 pounds N), the other, 46.7 ppm (335 pounds N). There's the potential that our assumption shows up as pretty conservative!

How does that help your NUE? Combined with the knowledge you have of your yields, your soil types - and potential losses thereof, your application method - and potential losses thereof, you can fine tune your N use rates. That way you're adjusting application rates based on economic return, not just yield - and that's Nitrogen Use Efficiency.

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