



**THE OHIO STATE UNIVERSITY**

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

### **Hardin County Extension News Release**

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### **High Nitrogen Prices Affect Fertilizer Recommendations**

*Hardin County* – Nitrogen fertilizer is a major cost in corn production and is a big lever that drives yield. However, not every pound of nitrogen fertilizer yields the same return on investment. The first several dozen pounds applied to a corn crop yields large returns in grain, with subsequent pounds still offering returns, but not as effective as before. As nitrogen fertilizer rates approach what would be typically applied to corn (150 – 200 lbs N/acre), each additional pound returns less and less and eventually reaches a point where the small increases in grain yield does not pay for the additional pound of nitrogen fertilizer applied.

This is not a hypothetical. It's the normal. It's what we see year after year in the majority of nitrogen rate trials we run across the state. And that's why Land Grant Universities in the Midwest have universally adopted an economic model to nitrogen fertilizer rates in corn. It's called the maximum return to nitrogen (MRTN) because it seeks to do just this, provide a rate where you will get the greatest return to your nitrogen investment and therefore grow the most profitable corn possible.

So, what is the magic peak where adding an additional pound of nitrogen fertilizer doesn't pay for itself? It depends of course! It depends on the current price of corn grain and nitrogen fertilizer. As fertilizer prices increase, the peak comes at lower nitrogen rates. But as grain prices increase, the peak comes at higher nitrogen rates. Both fertilizer and grain prices are higher than they've been in some time, so they work against each other in terms of increasing or decreasing the nitrogen fertilizer recommended rate.

Nitrogen tables have been prepared based on the recommendations of the MRTN calculator that show the price per ton of Anhydrous Ammonia and 28% Urea Ammonium Nitrate (UAN) at various price per pound of nitrogen fertilizer costs as well as the Ohio MRTN recommended nitrogen rates per acre for corn following soybean based on the price of corn grain and nitrogen fertilizer. These tables can be accessed at <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-39/implications-high-n-fertilizer-prices-corn-n-fertilizer>. Producers can also input their own nitrogen costs and corn prices to calculate the economic return to nitrogen using the Corn Nitrogen Rate Calculator which can be found at <http://cnrc.agron.iastate.edu/>.

With current fertilizer and grain prices, our recommended corn nitrogen rates are 15-20 lbs/acre less this year than they have been in years past. This might cause some growers to pause and consider if this is really a good idea, but if you want to maximize your profitability, lower rates will ensure you're not applying additional fertilizer that isn't yielding a high enough return to pay for itself.

*Article written by OSU Extension-Ag Crops Team and edited by Mark Badertscher, OSU Extension-Hardin County.*