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## **NITROGEN NEEDS FOR CORN**

One fact of life in farming is an outstanding corn crop needs nitrogen fertilizer to achieve optimal yields. In organic farming, nitrogen inputs come from legumes, manure and compost resources. On conventional fields we use a lot of anhydrous ammonia in this area of the state on our silty clay loam soils to meet the corn crop demand.

When prices of nitrogen fertilizer sources are at historical highs, it gets producers thinking about, am I applying too much nitrogen or can I cut back without hurting my bottom line? Everyone knows with nitrogen fertilizer, there is the law of diminishing returns. For the cost of each additional unit, there is a responding yield increase in any given year, and as you add more and more nitrogen units, there becomes a point on the yield curve for that field where yield increase as a result of the nitrogen slows and worse yet can decrease.

The University of Nebraska agronomy team now has 34 site years of yield data on corn in high yield irrigated environments. This data set will enable us to tweak our recommendations. It sounds like very little change, but the good news is we have a solid data set for corn yields in the 220 to 240 bushel per acre range.

Typically, the rule of thumb has been 1.2 lbs of nitrogen needed per bushel yield, and when following soybeans, you can subtract an additional 45 lbs of nitrogen. With technology, your management level can be taken a step further.

One step is to take deep soil samples to determine residual nitrogen in your soil in the top 2 to 3 feet of soil. Here is the rule of thumb. For every ppm of nitrate nitrogen concentration that you have in your soil to a four foot depth, the recommended nitrogen need is reduced by eight pounds per acre. When soil tests are not available, a value of 3 ppm is used to calculate the nitrogen recommendation using UNL guidelines. So residual nitrogen in your soil and crediting this properly can be a profit center for you.

Many folks do not realize an organic matter credit or nitrogen adjustment is used in UNL recommendations. In other words, with 3 ppm residual in your soil and a 1 percent organic matter sandy soil for a 240 bushel expected corn yield after soybeans, you need 220 lbs of N. But on 3 percent organic matter soils, the need is 155 lbs of N. Now why is that? Why do we have this savings?

No-tillers are experiencing increases in organic matter on soils. After 10 to 15 years of no-tilling, one might expect a 1 percent organic matter increase. That's huge in the fertility world. A 1 percent increase in organic matter means 1000 to 1400 lbs of organic N increase in your soil and these figures are conservative. Mineralized N from this organic pool is available to your crops each year. Mineralized N can vary widely, is extremely difficult to measure, and might vary from 75 to 200 lbs of N per year.



My point is this, if you are doing the soybean credit to increase your profitability, take a look at the next level of nitrogen management change. That is deep N sampling AND organic matter credit. This can be a new profit center for your operation.

Remember, commercial lab recommendations will vary and check if you are getting a bean credit and soil N credit. Our land grant university is the entity leading the way demonstrating that organic matter credit can be used to fine tune N rates. For more information, consult the UNL NebGuide at [www.ianr.unl.edu/pubsarchive/fieldcrops/g174.htm](http://www.ianr.unl.edu/pubsarchive/fieldcrops/g174.htm) or contact our office at (402) 821-2151.

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