Farm Views

Test Soils for Nitrates; Adjust Application Rate Accordingly

A positive outcome of last year's heat and drought appears to be an increased rate of soil mineralization, potentially increasing the amount of soil nitrogen readily available to plants. Mineralization is a term used to describe the conversion of organic forms of nutrients, which are not available to a plant, to inorganic forms that the plant can use.

University of Nebraska Cooperative Extension technologists working on the Wellhead Area Protection Project (WAPP), an irrigation and nutrient management demonstration project funded by the Nebraska Department of Environmental Quality, the Upper Big Blue NRD and the Little Blue NRD, are finding increased soil residual nitrate-nitrogen in soil samples from demonstration fields. Crop consultants and soil testing labs in central Nebraska also have reported increased soil residual nitrate-nitrogen levels.

Many of the fields showed levels of residual nitrate-nitrogen twice as high as last year, and some were four times as high. These increases, however are not necessarily typical of Nebraska as a whole. The nitrate levels in soil samples submitted last fall by farmers from across the state varied widely. Levels ranged from 13 pounds per acre to 240 pounds per acre of nitrate-nitrogen available for the 2001 crop. These broad variances further reinforce the need for accurate soil testing when calculating nitrogen credits and the need for purchased nitrogen.

Soil Testing

For most soils, the soil sample should be taken down to three feet, unless crop-rooting depth is limited due to soil conditions such as coarse sand or a high water table. In these cases, a minimum depth of two feet may be appropriate.

Once the residual nitrate-nitrogen content of the field is known, a nitrogen credit can be determined. The following example is based on results from a WAPP demonstration site in south central Nebraska. The residual nitrate-nitrogen credit, derived from a three-foot soil sample, indicated there was 100 pounds of nitrogen per acre already available for crop use. If anhydrous ammonia costs are estimated at $325 per ton, the residual nitrate-nitrogen is worth $19.80 per acre. Following University of Nebraska soil sampling guidelines, the projected cost for nitrate-nitrogen soil lab analysis will be approximately $0.20 per acre. This results in a net value of $19.60 per acre. (Actual costs for taking the samples in fields are not included.)

If a soil sample is not taken, a default value of 32.4 pounds per acre is assumed.

Soil Analysis

For more information on taking and submitting soil samples and for soil sample boxes and information sheets, contact your local cooperative extension office. Samples can be submitted to any certified lab, including the University of Nebraska Cooperative Extension Soil and Plant Analysis Laboratory. Mail samples to 139 Keim Hall, University of Nebraska, Lincoln, NE 68503-0916. The NU lab also can be reached by phone at (402) 472-1571; fax: (402) 472-1396; or by email at SPAL@unl.edu

For more information, the following publications are available in print from your local cooperative extension office or on the web at: lancaster.unl.edu/ag/crops/soils.htm

Guidelines for Soil Sampling, G91-1000, *Soil Sampling for Precision Agriculture*, EC154

Source: Mick Reynolds, Extension Technologist, South Central REC (TD)

Tips for Quality Samples

Soil test results are only as good as the sample. Following are a few tips for getting the most accurate results.

1. Take a sample from a depth of two to preferably three feet.
2. Composite five to ten soil cores when testing for nitrate. The sample should not represent more than 20 acres.
3. Separately sample dead furrows, alkali spots, terraces, fertilizer bands or fields that have been limed or managed differently.
4. Air dry samples for at least 24 hours before sending them to the lab. (Spread the soil out in a thin layer on a piece of paper or plastic, being careful not to contaminate the sample.)
5. Wrap the sample securely for mailing and place it in a sealed box available from your local cooperative extension office. Be sure to include an envelope with the fee and completed sample information sheet.

Reduce Nitrogen and Maintain Yields; Multi-plot Research Results Show the Thresholds

While you can't lower the price of anhydrous ammonia, you can manage your fertilizer application to avoid paying for nitrogen the crop won't use. The University of Nebraska (NU) has an extensive database of nitrogen field research and demonstrations where various nitrogen rates have been applied to corn and the yields have been measured. These studies can help producers make more informed decisions on nitrogen application. Through 20 years of on-farm testing, Nebraska University Institute of Agriculture and Natural Resources scientists have developed a specific method for determining optimum nitrogen rates for corn. There always is some yield variation, but the data is fairly consistent throughout Nebraska.

The NU recommendations put producers very close to maximum yields, but at nitrogen rates that are 30 to 50 pounds per acre less than what many farmers apply. At today's prices, the savings easily could add up to more than $10 per acre. Using a realistic yield goal is part of the recommendations. Use a five-year average plus five percent. Our research shows that many farmers use a yield goal higher than that, but fail to reach the yield goal 50 percent of the time. NU recommendations indicate that applying 75 to 80 percent of what was previously applied, may actually be the most profitable option, especially at today's nitrogen prices.

When fertilizer prices fluctuate, nitrogen use can be increased or reduced accordingly. Research shows that when corn is $2 per bushel and nitrogen is less than $0.13 per pound or $210 per ton of anhydrous ammonia, it is profitable to add 50 pounds of nitrogen to NU's recommended rate. However, when anhydrous ammonia prices rise above $0.22 per pound of nitrogen or $364 per ton, it is profitable to reduce the recommended rate by 50 pounds. This analysis doesn't include application costs.

Using data from 35 nitrogen demonstrations on sandy soils, average yields were 156 bushels per acre when the total nitrogen applied was 50 pounds less per acre than recommended. At the recommended rate, yields were 162 bushels, and at 50 pounds more than recommended, the yields were 165 bushels. Other researchers have found similar results in other areas of the state. (Many of these demonstration sites were on irrigated fields which may have had high nitrate levels. If your field situation is different, adjust the recommended rate accordingly.)

Reports indicate anhydrous ammonia supplies are limited and the cost of nitrogen, if available, will be near the point where reducing nitrogen by 50 pounds per acre from the recommended rate will be profitable. If prices rise to $0.30 per pound of nitrogen, use 75 percent of the university's recommendation for nitrogen, then monitor the crop and add more nitrogen by side-dressing if deficiency symptoms appear. (TD)

For more information, see the following NU cooperative extension NebGuide, *Fertilizer Suggestions for Corn*, G74-174.

Source: Charles Shapiro, Extension Soils Specialist, Northeast REC

Graze Conservatively Following Drought Year

When spring finally arrives, all pastures will green up like normal. But don't let that first growth fool you. Below ground, many plants still are suffering from the effects of last year's drought.

During normal years, over half of the roots in grass plants die and need to be replaced. Drought reduces root growth, thus lowering the plant's ability to replace dead roots. Grazing drought-stressed plants, especially heavy defoliation, simply worsens the situation.

Deep, healthy roots are needed to absorb nutrients and moisture from soil and to initiate new growth after grazing. If you grazed drought-stressed pastures heavily last year, early removal of spring growth this year could leave you with plants with little energy for regrowth or roots too short to reach deep moisture. That means lower yield, reduced carrying capacity, and extra stress again this year.

So what should you do? Begin with realistic stocking rates. Even with average subsoil moisture and growing season rainfall, reduce stocking rates about 10 percent from normal to account for weakened root systems. Also delay turn out a couple weeks so plants develop enough leaf area to begin repairing injured roots. And when you do graze, always have at least a couple of healthy leaves remaining to harvest sunlight to energize regrowth.

To make up for this forage production shortfall, graze winter wheat or alfalfa. Plant oats or summer annual grasses for grazing. Or cross fence pastures to encourage better grazing distribution.

Don't risk long-term pasture injury for short-term feed gains. Manage grazing to help pastures recover from last year's stress. (TD)

Source: Bruce Anderson, Extension Forage Specialist, UNL

Farm Labor

As agricultural operations increase in size and family members move away from the farm, it is becoming less likely that family members will provide all of the labor on the operation. As farmers and ranchers begin to hire employees, there is a set of skills, techniques, and information that must be learned to effectively hire, train, and manage a group or even one employee. Unfortunately, if these techniques are not learned, it may cause a reduction of time and or increased workload for the farm owner. It may also cause a significant reduction in productivity for the operation.

Recently, I have heard many producers complain that good employees are hard to find. This complaint is only amplified when we have the current conditions of low commodity prices, low unemployment caused by economic prosperity in urban areas, and increased accessibility of transportation. When these three conditions exist it is difficult for agricultural producers to compete for employees against other organizations and industries that may offer higher wages, more benefits, stable hours, and paid vacation time.

Competition for employees, what does that mean? It means that currently, there are more jobs than there are people, especially in Eastern Nebraska. This in turn means laborers can choose where they want to work. This phenomenon forces employers into a bidding war similar to what is currently happening in the sports industry with free agency. In the past, agriculture producers have generally lost when this has happened. Why?

1. Lack of financial resources.
2. Lack of human resource management knowledge.

What can farmers do to

*See **LABOR** on page 11*