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Invest in soil tests to improve fertilizer efficiency

By Bob Schoper, CCA

Are you feeling sticker shock over fertilizer prices? You're not alone. We're looking at costs of $1,000 per ton for anhydrous ammonia and diammonium phosphate, and $900 per ton for potash. So efficient fertilizer use is more important than ever before.

The two most important things you can do to improve your fertilizer management are to measure the nutrient status of your fields through soil tests, and follow nitrogen Best Management Practices for your region and soils.

Current soil samples will help you make the most accurate and profitable fertilizer decisions, and could lead to savings on phosphorus (P), potassium (K) and nitrogen (N). Soil testing "is like maintenance on your car," says Gyles Randall, University of Minnesota soil scientist. "You change the oil every so often on your car. With soil testing, you're doing maintenance on your soil."

All Minnesota growers should regularly test for pH, P and K. In high-producing areas, you should also test for the micronutrient zinc. June is an ideal time to collect samples, Randall says, but if you missed sampling this spring "try to get into your soybean fields as soon as possible this fall. Don't delay."

Randall recommends soil sampling every other year in a corn-soybean rotation. On owned land, he suggests doing intensive grid sampling to establish a detailed baseline profile and provide a clear picture of fertility variations within fields. "Then every two or three years, sample selected areas to see how they are changing." Be sure to select follow-up sampling areas that represent a range of fertility. Collect 10 to 12 soil cores per sample from a depth of 0 to 6 inches. If you suspect a soil anomaly, don't hesitate to adjust grid sampling sites based on your knowledge of field variations.

On uniform fields or leased ground, it's more economical to collect composite soil samples. Draw at least 20 randomly-chosen soil cores from an area of 20 acres or less, collecting soil from representative areas of the field.

In western Minnesota, consider doing a two-foot fall soil nitrate test. This is especially useful if you suspect higher-than-normal levels of nitrate-N, such as after a drought year. The test is also helpful in fields with a history of manure. In eastern Minnesota, the fall soil nitrate test is not useful. Eastern Minnesota growers should do a spring preplant soil nitrate test on continuous corn fields or ground with a longtime manure history, Randall suggests.

Be sure to deduct nitrate-N credits from your total N rate.

Select the most profitable N rate. New Minnesota nitrogen rates for corn are not based on yield goals, as in the past, but on soil productivity, the ratio of nitrogen fertilizer cost to grain value, and the previous crop. Recent surveys show that many growers "have not changed rates of N application much over time," Randall says. "But with high costs of fertilizer, it's important to consider changing your rate and using all the best

management practices for nitrogen." An on-line N rate calculator can help you choose the most profitable rate. Go to: http://extension.agron.iastate.edu/soilfertility/nrate.aspx.

Cut N loss risk. Nitrogen efficiency is affected by N source, rate, application time, placement, and weather. In June, the U of M issued new nitrogen use guidelines for four Minnesota regions, and for coarse-textured soils and irrigated potatoes. The guidelines are available from your local Extension office, certified crop advisor, or on the Web at www.extension.umn.edu/distribution/cropsystems.

Here are a few reminders for avoiding N losses this fall:

•Avoid fall N application in sandy soils with high leaching potential. The most efficient practice in coarse soils is a split N application.

•Don't apply UAN or any fertilizer containing nitrate-N in the fall. These fertilizers are susceptible to leaching as soon as they are applied.

•Incorporate urea within three days to a depth of three inches.

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Key Ideas

•Soil sampling will help you make more accurate fertilizer decisions

•Use new U of M guidelines to select the most profitable N rate

•Cut N loss risk by following Best Management Practices