

# AGVISE

## LABORATORIES

SPRING 2008

### Soil Testing Pays Even Better Now!

If there was ever a time for growers to have their fields soil tested, it is NOW! With the high cost of land, fertilizer, seed and fuel, growers must look at the economics of a wise fertility program, which includes soil testing. The cost of laboratory analysis is only up a small percentage over the past 10 years, while fertilizer, seed, fuel and land has at least doubled over this same time period. Growers can't afford to over-fertilize or under-fertilize. Without soil testing, they're guessing. Using crop removal values instead of soil testing is the most expensive and is the least effective methods of making fertility management decisions. With these high costs, fertilizer has to be placed where it is most needed. This can be accomplished by wiser methods of sampling and application. Soil testing fields by productivity zones or grids are the best methods to accomplish this task. Guessing by doing what the neighbor does, by using old soil test results or by using county averages are not very wise or very profitable no matter what crop and fertilizer prices are.

### SOUTHERN TRENDS

Soil sample volume was up big time last fall at our Benson, MN laboratory. We serve a wide array of customers including fertilizer retailers and consultants from MN, SD, NE and IA. Even after accounting for all of the Northwood, ND samples tested in Benson last fall, we tested a record number of samples for our Benson customers. The increase was in all types of soil samples including zone samples, grid samples, and even very basic conventional composite samples. Right now growers are looking to get the most out of their fertilizer dollars and soil testing is a major component of their fertility management plan. AGVISE customers are helping their growers get the most bang for their fertilizer buck through increased soil testing. Keep up the good work! Please give me a call if you have any suggestions on how we can improve our testing services.

**AGVISOR Gold Programming in Progress Again:** We are again working on the next AGVISOR Gold Update. The tornado in Northwood put this on the back burner for a while, but we are again working towards a 2.8 update. The current 2.7 version is

working well on computers with the XP operating system. As our programmers have been making changes to the AGVISOR program, we have encountered more issues with the "Vista" operating system that will require additional programming. With these "Vista" issues in mind, we recommend that you keep the AGVISOR Gold program on a computer with an XP operating system. Just like most other businesses, AGVISE will not be going to the "Vista" operating system for a while. We figure Bill Gates has a few bugs to work out of "Vista" before we make the move. If you do try to run the AGVISOR program on a "Vista" computer, we cannot guarantee that the program will operate on your computer. Since we are in the middle of an update to the AGVISOR program, it would be great to get suggestions for ways to improve the program. Sending us an email is a great way to tell us what you need.



**RICHARD JENNY**  
AGRONOMIST/CCA

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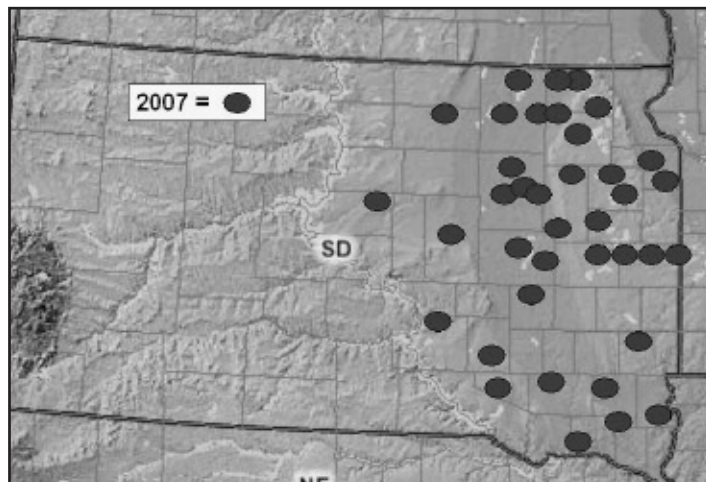
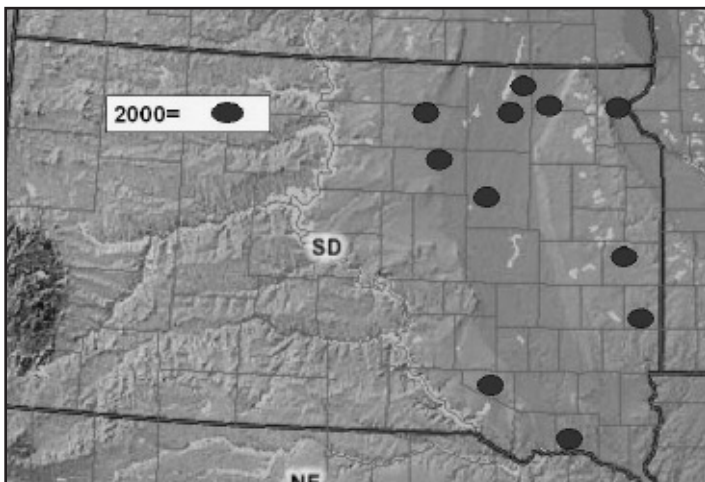
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# Zone, Zone... Get in the Zone

Splitting fields into productivity zones for soil testing has really taken hold in the northern plains. Information layers used for creating these zones includes vegetation maps, topography maps, salinity maps, yield maps etc. In most situations more than one layer of information, along with verifying these

factors in the field, result in very useful maps for nutrient management. Since 2000, an increasing number of AGVISE customers have started offering zone soil testing to their growers. In the maps below, each circle represents one AGVISE customer who offers zone soil testing to growers. You can see the

increase from 2000 to 2007 in the figures. Zone testing now accounts for between 20-25% of all soil samples received by AGVISE Laboratories. If you have any questions on how zone soil testing would help you serve your growers better, please contact our technical support staff.

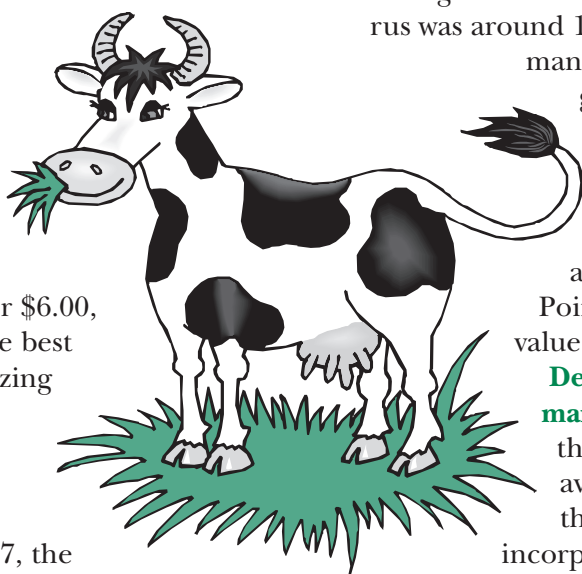


# Manure – Smells like money now!

Now that fertilizer prices have hit all time highs, growers are taking a new look at the “original” fertilizer. Manure is no longer considered a waste, and it no longer costs more to haul and apply the manure than the value of the nutrients in this smelly solution.

Accurate information is the most important part of calculating the value of the manure and proper application rates. Have the manure and soil tested! Using the “book” values for manure nutrients when input and commodity prices are this high would be playing with fire. With wheat prices around \$20.00 and corn over \$6.00, every grower wants to get the best yields possible while maximizing the efficiency of fertilizer inputs.

When looking at manure samples that were tested at AGVISE Laboratories in 2007, the



variability is tremendous. Management practices, rations, storage, time of year, and many other factors all influence the amount of nutrients in the manure at hauling. The highest value for phosphate-phosphorus in liquid swine manure was 120 lbs/1000 gallons, the lowest value was less than 1 lb/1000 gallons. The average value for swine manure phosphate-phosphorus was around 18 lbs/1000 gallons. For poultry

manure samples in 2007 the total nitrogen varied from 26 lbs/ton to 143 lbs/ton. The average value of total nitrogen in poultry manure was around 58 lbs/ton. With this kind of variability how could anyone not afford to have manure tested?

Points to consider when calculating the value of manure:

**Determine the nutrient value of the manure.** Have the manure tested and

then calculate the nutrients that will be available to the crops depending on the application method and timing of incorporation. Remember to consider the

*Continued on page 5*

# Northwood Building Update

On August 26, a tornado destroyed AGVISE Laboratories Northwood facilities. Since then a lot of sweat and long hours of hard work have been poured into our new building. The 40,000 square foot building is quite a sight on the prairie. We are looking forward to the efficiency of having everything under one roof in our new building.

Construction has gone very well through the winter months and we expect to be moving into the office area around May 1. We are very excited about the additional efficiency and capacity we will have in our new building. We will have 20% more sample grinding capacity and room to expand drying capacity by 50%. We have installed a new dust control system, which has already created a cleaner work place for our employees. All soil samples are already being received, dried and ground in our new building.

The data entry and computer portions of the laboratory will also be more efficient. All data entry stations will be in one area allowing employees to work more efficiently as a team during the busiest times of the year.

We are already using many of the new instruments in our temporary facility. These new instruments have bells and whistles just like a new car! Some of the new instruments are faster, some are more accurate and others use newer technology than the older instruments that were destroyed. We will be moving all of the new instruments and equipment into our new building when the spring testing season is completed. We will try to keep everyone updated on our new building through newsletters like this and by email.



*New ICP instruments.*



*New nitrogen instruments.*



*New grinder dust control.*



*Outside of new building.*



*New dust control.*



*Drywall taping.*



# Nitrogen Fertilizer Guidelines for the Future

## Common Sense Will Prevail

### Corn Belt - “N”

The debate over how nitrogen fertilizer guidelines should be changed in the Corn Belt is just heating up. Recent research shows growers are often applying more nitrogen than needed. The way we have calculated nitrogen guidelines for the past 40 years (1.2 lbs of N for each bushel of corn yield potential minus previous crop contribution) apparently is a little high in some situations. One reason we are applying too much nitrogen in the Corn Belt is that we are not accounting for all of the nitrogen provided by the soil. Each year the soil provides nitrogen during the growing season as organic matter is broken down by microbes and nitrogen is released for crop use (mineralization). This is in addition to any soil nitrate carry over. Highly productive soils tend to mineralize more nitrogen through the growing season compared to less productive soils so they require less nitrogen fertilizer to achieve high yields. In order to make better nitrogen fertilizer guidelines, we need a soil nitrogen mineralization test. A good mineralization test would determine how much nitrogen a soil will “put out” during the growing season and let us account for it in our fertilizer guidelines. Just because we do not have a good soil N mineralization test yet, does not mean we should stop trying to make better nitrogen fertilizer guidelines for the higher rainfall areas of the Corn Belt.

Using technology such as satellite images, salinity maps, topography maps and yield maps to divide fields into productivity zones is a start. It is important to determine what factors are limiting production in each zone (low organic matter, coarse soil texture, poor drainage etc.) In the Corn Belt, soil samples from each “zone” should be tested for %OM, to help fine-tune your nitrogen recommendation. You can use this factor to make adjustments to the current nitrogen fertilizer guidelines. At the end of the season, basal stalk nitrate samples should be collected and tested from each zone. This is very a good tool for evaluating your current nitrogen fertilization program. If the stalk nitrate level in a zone is rated as excessive, the N rate for corn in that zone can be reduced the next time corn is grown. If the stalk nitrate level is rated as low in a zone, the rate of N fertilizer should be increased. Fine-tuning the current nitrogen fertilizer guidelines by applying different rates to each zone helps us to match crop needs bet-

ter. We can use common sense to make small adjustments to our current nitrogen fertilizer guidelines as we wait for researchers to develop a useful soil nitrogen mineralization test.

### Great Plains – “N”:

Researchers in the Great Plains are also working towards making more accurate nitrogen fertilizer guidelines. With lower rainfall and much cooler temperatures, the plains area has the advantage of being able to use the annual 0-24” soil nitrate test. The soil nitrate test has been the backbone of nitrogen fertilizer guidelines for the past 40 years in the plains. In these dryer areas, soil nitrate is part of the nitrogen supplied by the soil. Each fall we can easily test how much nitrate nitrogen is in the soil after harvest. In dry years, when yields have been reduced, it is common to have high levels of soil nitrate remaining in the soil after harvest. Research has shown that much lower rates of nitrogen fertilizer are required for the following crop when the 0-24” soil nitrate level is high. The soil nitrate test has saved growers millions of dollars over the past 40 years and protected the environment from over application of nitrogen.

While the soil nitrate test is a very good tool, it would be great if we had a soil N mineralization test as well. The soil nitrate test only tells us what is left over in the soil, it does not tell us how much nitrogen a soil will “put out” or “mineralize” during the growing. Until we have a good soil mineralization test, there are things we can do to make better nitrogen fertilizer guidelines. We can start by dividing fields into productivity zones (sound familiar?). In the Great Plains, it is also important to know which factors are limiting productivity in each zone. Factors such as, low organic matter, coarse soil texture and poor drainage in addition to soil salinity can affect productivity greatly. With this information we can “tweak” our current nitrogen guidelines within each zone. Each year we can follow up after harvest with a soil nitrate test in each zone in addition to the stalk nitrate test. If the soil nitrate test is high (>60lb/a) then the rate of nitrogen for that zone can be reduced. If the soil nitrate level is too low (<15 lb/a) then the rate of nitrogen should be increased for the next year. Common sense will guide us along the way until we have a soil nitrogen mineralization test, which will help us fine tune our nitrogen fertilizer guidelines in the future.

# Ortho or Poly Phosphates?

Every year we get questions on what form of phosphate fertilizer is better. The debate over orthophosphate or polyphosphate has been going on forever and just when we think we have put this question to bed it comes up again. The truth is, either form of phosphate fertilizer will give you the same yield response.

Driving some of the water from phosphoric acid produces short chains of orthophosphate which become linked together forming polyphosphate or long chains. Once the water is removed, the fertilizer material now contains mostly longer chains of phosphorus or polyphosphate with smaller amounts of orthophosphates (short chains). When polyphosphate fertilizer is applied to the soil, the fertilizer reacts with soil water quickly and produces

orthophosphates again (short chains). Most dry fertilizers are orthophosphates where most liquid fertilizer materials contain polyphosphates. All phosphorus fertilizer materials are affected the same way when they are put into the soil. Polyphosphate chains become orthophosphate chains once the soil water reacts with the fertilizer. Plant uptake is mostly in the orthophosphate form. One example from years of research showing that both fertilizer materials produce the same yield is shown in the table. If you would like a more complete explanation of this question and several other common fertilizer questions, do a Google search on “Effectiveness of Using Low Rates of Plant Nutrients”. There is a lot of good information on this site!

## Polyphosphate vs. Orthophosphate?

P - Applied	P - Source	P - Source
lb/a P <sub>2</sub> O <sub>5</sub>	Polyphosphate	Orthophosphate
	Corn bu/a	Corn bu/a
15 lb/a	124	124
30 lb/a	134	134
45 lb/a	142	142

University of Nebraska – Low P Soil Test Site

## Manure cont.

cost of the micronutrients, such as zinc and copper, in the manure if needed for the crop. Put a value only on the nutrients that are needed by the crop. If you are applying 200 lbs/acre of potassium and the field only needs 50 lbs/acre, calculate the value based on 50 lbs/acre. Deduct application costs associated with handling and hauling manure that are above the costs of applying commercial fertilizer.

**Determine the needs of the field.** After having soil tests done, determine which fields would benefit most from a manure application. Typically very low testing fields benefit the most from manure applications. Manure is not like commercial fertilizer where you can order a custom blend. In many cases several nutrients in the manure will be in excess of the crop’s needs. Nutrients like phosphorus and potassium can be built up in the soil for future crops, but caution needs to be taken so these levels do not become excessively high. Applying manure before the corn crop in a corn-soybean rotation takes advantage of extra phosphorus and potassium. Matching the field to the manure supply will also give the most economical use of the nutrients.

Regulations and rules have mandated testing manure, but the current price situation for fertilizers and commodities, make proper manure management a financial necessity. Growers want to put this valuable nutrient resource to good use in their fields.

# AGVISE

LABORATORIES

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## PRESIDENT'S CORNER

As I sit here writing this column, the price for cash wheat in Northwood is \$21.40 per bushel. If somebody had told me a year ago the price of wheat would be over \$20 per bushel in February of 2008, I would have assumed this individual was crazy.

In regards to spring wheat prices, the production of wheat is not meeting world demands. I assumed the spring wheat acreage in the US was down sharply in 2007, but based on statistics from the USDA, wheat acreage was similar to 2006. This was true for both ND and US. The yield of spring wheat was a few bushels below trend line averages in 2007, but still was not too bad. However, the falling US dollar is making our commodities cheaper for foreign buyers. Weather conditions world wide in 2007 were not favorable for wheat. Millers around the world are afraid they will run out of wheat before the 2008 crop is harvested.

The outlook for a huge crop in 2008 is somewhat marginal in my opinion. Our western trade area is very dry at this writing. The lack of snow cover in some of these areas may make winter wheat survival somewhat questionable. Our region will need timely rainfall, as subsoil moisture is short or none existent. Large areas of the wheat producing states are currently rated "dry" to "severe" in regards to drought intensity. Who can imagine what wheat prices will be this time next year.



**BOB DEUTSCH**  
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## NORTHERN NOTES

High crop prices and input costs are giving growers an uneasy feeling. Growers don't want to miss an opportunity to get high yields with these high crop prices, but they also don't want to over spend on fertilizer. Soil testing is one way to ease growers concerns about the money they are investing in fertilizer this year. While most soil testing was completed last fall (Yea!), there is always a little more soil testing to be done in the spring. Some growers may have picked up more land and need to get a soil test this spring. Some areas had late harvest conditions and did not get a chance to finish soil testing before winter set in. While spring soil sampling can be difficult, it is important to get the best sample you can. Having good equipment is very important.

AGVISE Laboratories staff in Northwood are ready for a busy spring season (see "Building Update" article). We now have the capacity to test over 1000 samples each day in our temporary laboratory. Through the winter we have added additional instrumentation and equipment to handle complete soil nutrient analysis during the spring rush. If you need any sampling equipment or supplies, please give us a call. We have everything you need to make your spring soil testing go smoothly!



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