

AGVISE

LABORATORIES

SPRING 2007

NORTHERN NOTES

2006 reminded us all that it can still get dry in the northern region. Recent snowfall has reduced some of the drought talk, but in the planning process you need to keep in mind the current soil moisture situation in your area. Last spring most areas up north had a sub-soil full of water. This was a great cushion for all crops and was the main reason yields held as well as they did.

With less stored subsoil moisture this spring, we need to be careful in setting yield goals to make sure they are realistic based on actual production. While it is important to be optimistic, we have to be realistic as well. One rule of thumb is to set the yield goal about 10% higher than the average yield achieved on a field.

We also need to remind growers of the importance of starter fertilizer for small grain and corn. While we usually talk about cool wet soils and the need for starter fertilizer, some of the biggest responses to starter fertilizer occur in relatively dry soil conditions. Starter fertilizer (especially phosphorus) stimulates root growth in the area of the starter band. Any extra root growth helps plants to take in water, increases growth and reduces the stress on seedlings.

Soil testing will be in high demand this spring with strong fertilizer prices and growers wondering if their fields have higher nitrate levels following a dry 2006. AGVISE is ready to handle the spring soil samples you will be sending our way. If you need any supplies or soil sampling equipment, please give us a call. We hope everyone has a safe and smooth spring season!



JOHN LEE
SOIL SCIENTIST/CCA

Can I count on that high N soil test?

2006 was a very dry year across the Midwest with many areas suffering drought conditions. The result in many areas was lower crop yields and higher residual nitrate levels last fall. Our staff receives many questions from people wondering if they can trust their fall soil nitrate test results. They want to know if they can follow the high soil test results and apply a lower than normal rate of nitrogen fertilizer and still get high yields.

As the dry summer progressed, AGVISE staff anticipated these types of questions and began a weekly sampling project on a local wheat field to gain information on

the stability of the soil nitrate test when a field tests very high. In late August our staff started collecting a weekly soil sample from a nearby harvested wheat field. A composite soil sample was collected every week from mid August through mid November. The 20 soil core points were marked with a hand held GPS each time the field was sampled. The composite soil sam-

ple from this field was tested in the laboratory like any other customer sample. Weed growth and volunteer wheat was controlled with a herbicide once after harvest and the field was tilled once late in October.

In the figure you can see that this wheat stubble field had over 100 lb/a nitrate nitrogen in the 0-24"

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Can I count on that high N test? continued...

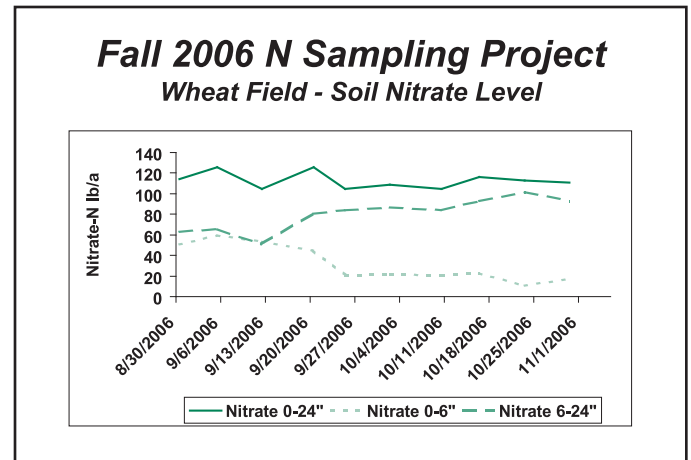
profile at the end of August. The grower had a hard time believing the first soil test because he had harvested a good wheat crop from this field. As the grower saw the test results each week coming in at between 100-120 lb/a, he began to believe that this field did have a very high level of nitrate in the soil. We are speculating that the high soil nitrate level in this field is a result of the breakdown of weed growth and cover crop from 2005 when this field was not planted.

Many people also question how much of the nitrate will remain in the 0-24" profile if we get a lot of rain? This field happened to get two significant rains totaling about 4" of rain at the end of September. You can see in the figure that there

was some movement of nitrate from the 0-6" profile down into the 6-24" profile. You can also see that the total soil nitrate in the 0-24" profile stayed in the 100-120 lb/a range all fall. This should give you confidence that on a medium textured

soil, a large rainfall event is not going to wash all of the nitrogen out of the soil profile.

This field is a good example of how a high fall soil nitrate test on a medium textured soil can be trusted. The amount of N required for a



corn crop on this field will only be in the 40-60 lb/a range which is much less than the normal rate. With the high price of nitrogen fertilizer and the tight supply, it is important for growers to know the level of soil nitrate in their fields.

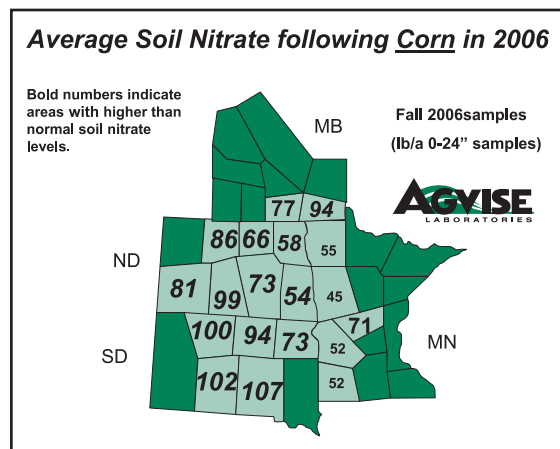
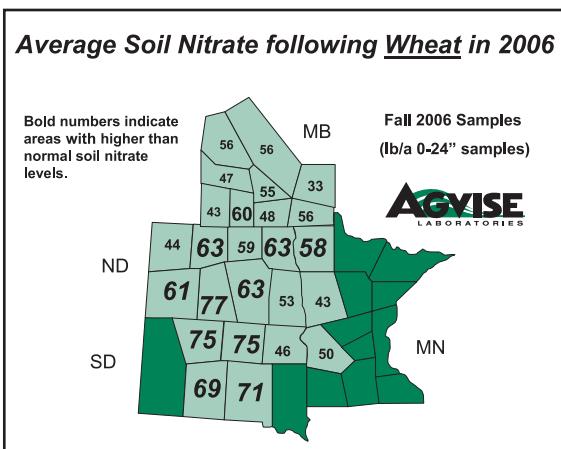
2006 Drought Leaves Soil N High

Drought conditions across the Midwest have resulted in many fields having a higher than normal amount of soil nitrate remaining in the soil profile. With yields being reduced in some areas due to the dry conditions, crops did not use all of the nitrogen from the soil profile. Soil nitrate testing in the fall accounts for the nitrogen that was left over.

In some areas the amount of nitrate left in the soil is very high. The bold numbers in the figures represents areas where the average soil nitrate is much higher than normal. One figure represents the average soil nitrate level following wheat production and the other figure represents the average soil nitrate following corn production. In some areas you can see that the average soil nitrate level is at about 100 lb/a. The normal amount of nitrate left in the soil following good crop production is about 20-40 lb/a.

Those fields with a very high soil nitrate level will require a lot less nitrogen fertilizer than growers would normally apply. This will greatly reduce the cost of nitrogen fertilizer on fields testing very high in soil nitrate. Soil

testing is the key to finding out how much nitrate is left in each field. Regional trends tell us all what the big picture is, but do not help us make decisions on individual fields.



Corn on Corn Production Tips

Everyone expects more corn on corn acres this year and Hybrid selection is as important as always. While you may not get the exact Hybrids you want this year due to high demand, you still need to do the agronomy right to maximize profitability in 2007. Even under the best growing conditions, you need to recognize that it is common to see a 5-10% yield drag for corn on corn compared to a corn on soybean rotation.

Field Selection: Select highly productive fields. Avoid fields with poor drainage or lack of water holding capacity. Lighter textured sandy soil may not hold enough water for high yields, especially since subsoil moisture is limited following below normal precipitation last fall and winter.

Stand Establishment: Seed placement, uniformity of emergence and stand is vital in high yield corn production. Keep the planter out of the field when it is too wet or too cold (< 50o F). Planting into wet fields increases compaction, restricts root growth and reduces yield. Vigorous rapid germination and emergence are necessary for high yields. To help insure the best stand establishment, planter speeds may need to be reduced.

Residue: Corn has more than two times the residue compared to soybean. Planting corn into heavy stalks will



require residue removal from the seed row. Row cleaners are necessary when planting on old corn acres to get even emergence. Increased residue usually means delayed planting due to cooler and wetter soil conditions early in the season. Good seed to soil contact is extremely important and poor residue management may hinder uniform germination, emergence and reduce yields.

Fertility: The N + K₂O should be limited to 10 lb/a in contact with the seed when planting in 30 inch rows. 2 x 2 placement allows much higher rates of fertilizer to be placed near the seed. Starter fertilizer for corn cannot be over emphasized with early planting dates! Soil nitrogen level following corn last fall varied a lot from field to field. Soil testing this spring is a priority if the field was not tested last fall. The rate of N required for corn following corn is normally 30-40 lb/a higher compared to following soybeans. This extra N is necessary to overcome the N immobilization attributed to the high C:N ratio of corn stalks and roots as compared to the soybean residue where the C:N ratio is lower and the residue amount is much less. It is also important to provide other important nutrients like phosphorus, potassium, sulfur and zinc based on a soil test.

Manure Management Plans and Manure Testing

For as long as I can remember, the paper trail associated with farming has increased. The last 5 to 10 years have probably created the biggest pile of paper work for farmers. CNMPs, NMPs, MMPs etc. are only a small but important part of this mountain of paper work.

Manure Management Plans are required for application of manure to land in many states including Minnesota and the Dakotas, depending on the size of the livestock operation. Many farmers are finding out how difficult it is to tackle a MMP for their farm and are turning to crop consultants to help. Having the proper paper work not only satisfies many of the state and federal requirements, but it is also essential for monitoring soil nutrient levels and maximizing the value of manure.

AGVISE agronomists routinely receive questions about what the "average" manure test is or what the "average" soil test is. To answer this



question would be like throwing darts blindfolded. Manure testing is the only way to know what the nutrient content of a particular manure source is. A manure test is very inexpensive compared to the price of commercial fertilizer. Like a soil test, a manure analysis is only as good as the sample sent in to the laboratory.

Testing manure allows producers and their consultants to make informed decisions as to where to best utilize the nutrients for their crops. Although some of the state regulations only require testing every four years or more, to get the most accurate nutrient information, test-

ing before or during each application event or at least annually will give the best information for nutrient management. Manure by nature is quite variable. Little changes in an operation can have significant changes in the nutrient level of manure. Some of these changes the producer has no control over, such as the moisture content of an open pit or pile. Other things like changes to rations the producer can control, like the use of low phytate corn to reduce phosphorus concentrations of the manure.

No one will penalize a farmer who tests more than the law requires, and it only makes sense to have a more detailed plan when prices for commodities and INPUTS are at unprecedented high prices.

AGVISE Laboratories Benson location has been analyzing manure for over 15 years. This lab has been a Certified Manure Testing Laboratory by the Minnesota Department of Ag since the program started in 1996.

AGVISE – Precision Helpers List Grows!

A year ago AGVISE established a list of Precision Helpers on our web site. These businesses are AGVISE customers who offer Precision Ag services to fertilizer dealers, crop consultants and growers. That list has now grown to 14 businesses. You can see this list on our web site at www.agvise.com.

Many of these businesses can provide part or all of the things necessary for your business to get started in Precision Ag. They have many years of experience and are located all across this region. Maybe you only want help creating the zones for soil sampling or making a fertilizer spread map. Maybe you want one of these businesses to work for you and do all of the things involved with Precision Ag for your growers. Maybe you want to work with one of them to figure out what type of precision nutrient management program will work best in your area like zone management or grid sam-

pling. You might also want some guidance on what is the best way to create management zones in your area. To create the most meaningful zones in your area you may need to get Veris maps (salinity), satellite images of past crop canopy, very accurate topography maps, yield maps or all of these layers of information combined.

One of the most important pieces of information you need to get from your “Precision Helper“ is how to price your Precision Ag program so it provides good value to your growers, yet is a profitable part of your business. You need to carefully consider your current staff and how much time if any, they will have to put towards your precision program.

If your business is already involved in Precision nutrient management and you would like to be added to our list of “Precision Helpers” or you have any other questions, please give Richard Jenny or John Lee a call.

AGVISE Giant Pumpkin Contest 2007

AGVISE giant pumpkin contest last year was a lot of fun for everyone who tried to grow a Giant! (2006 winner in picture!) AGVISE will sponsor a giant pumpkin in 2007 as well, but with a few minor changes.

There are only a few rules for this contest and they are listed below:

1. You have to be an AGVISE Soil testing customer to participate. That means that one of your growers or friends cannot grow the pumpkin and then you take a picture with it. We want to see if YOU can grow a giant pumpkin! (you have to do the work).
2. You must have an official weight of your pumpkin. You can use your local elevator scale, or the weight from any certified scale.
3. You have to submit a color picture of yourself with the pumpkin by October 1. AGVISE must be able to use the picture in our newsletter. There are no other rules!!!
4. 2007 Contest Winners: 1st prize \$200.00, 2nd prize \$100.00, 3rd prize \$50.00

You will want to get your pump-



Jason Meyer, Walhalla, ND

kin seed ordered very soon. It is very important to have good giant pumpkin seed! (I am planting Atlantic Dil this year and would recommend that variety). If you want to buy “one” seed from Ron Wallace’s 2006 world record 1502 lb pumpkin, it will only cost you \$245.00. If you don’t want to spend quite that much money on seed, you can buy seed from the 2005 record pumpkin for only \$2.00/seed. If you do a “Google” search on “Giant Pumpkin Seed” you will find several sources of economical seed. Good luck with your giant pumpkin in 2007!

SOIL TRIVIA

Question 1: What common soil amendment can I apply to lower the soil pH?

Answer: 10,000 lb/a of elemental sulfur has decreased the soil pH from 8.0 to 7.6 over the past two years in an AGVISE demonstration project established in 2005.

Question 2: What common soil amendment will not lower the soil pH

Answer: 200 lb/a and 5000 lb/a gypsum has not lowered the soil pH over the past two years in an AGVISE demonstration project.

If you want to learn more about soil amendments go to www.agvise.com click on “Technical articles” then “Soil Amendments” or under recent articles select “High Soil pH – Can we fix this problem?” You can also find additional information on gypsum in a new NDSU publication SF 1321: “Effectiveness of Gypsum as a Soil Amendment” published in November of 2006.

Irrigated Corn – Nitrogen Fertility

Irrigated corn in our region is generally planted on old corn ground with some acres coming out of soybeans or potatoes. Most irrigated fields are considered highly productive when managed properly. We have received some questions over the past few months about any changes in the nitrogen guidelines for irrigated corn in Minnesota, based upon the regional approach to corn N fertility. There are no new university guidelines specifically for nitrogen management on irrigated corn in Minnesota. Surrounding states such as Nebraska, Wisconsin and North Dakota, have research from irrigation studies, which were used to develop nitrogen guidelines for irrigated corn management in each state.

The state of Nebraska developed a nitrogen guideline equation that involves:

1. Soil testing for nitrate-N to a depth of at least 24” and as deep as 48”
2. Soil testing for organic matter (OM)
3. Nitrogen credit for previous crop
4. Manure testing for N
5. Irrigation water testing for N

Example: 200-bushel corn yield goal - The starting point for nitrogen is 180 lbs N/acre when the soil has 3% OM, 210 lbs/acre with a 2% OM and 240 lbs N/acre if the soil is at 1% OM level. (see table). The rate of N is then reduced based on the soil nitrate test level, any previous crop credit, a credit from nitrogen in the irrigation water and any nitrogen credit from applied manure.

N fertilizer guidelines in NE.

Expected Yield (bu/a)	Soil Test Organic Matter		
	3% OM (N rate)	2% OM (N rate)	1% OM (N rate)
200	180	210	240
220	200	230	260
240	215	250	280

N - rate is reduced based on soil nitrate test, previous crop credit, N in water and manure N.

North Dakota State University has conducted irrigated corn research at the Oakes research station for several decades. The current NDSU corn N guideline equation is based upon a yield goal, soil test N, previous crop credit and manure credits. The same calculation is used for irrigated corn as for dry-land corn. The nitrogen rate applied for irrigated corn is generally higher based on a higher yield potential under irrigated conditions.

$$\text{N needed} = (1.2 \times \text{yield goal}) - \text{soil test N} - \text{previous crop credit} - \text{manure credit}$$

Wisconsin has nitrogen guidelines specifically for corn on irrigated sands. Their guidelines can be found on the Internet by using the “Corn Nitrogen Rate Calculator” (Google “N-rate calculator”). From this calculator, you can see that the N fertilizer guideline range is from 190- 215 lbs N/acre regardless of a soil nitrate test, previous crop credit, manure credit or the level of organic matter. The N guideline range is adjusted based on changes in the price of nitrogen and corn.

In summary, if you have highly productive irrigated fields, then 180 to 210 lbs N/acre should be used as the nitrogen rate starting point and then credits for soil nitrate, previous crop, manure and nitrogen from the irrigation water should be considered. If you are using our AGVISOR Gold soil test reporting software, you can change the N factor of 1.2 lb per bushel used to calculate the nitrogen guideline for corn, to a factor you think is appropriate for your area. If you have any questions on how to change this N factor in your AGVISOR program, please give John Lee or Richard Jenny a call.

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PRESIDENT'S CORNER

April 1 will mark 30 years in the soil testing industry for me. In 30 years, I see more optimism in agriculture this spring season than ever before. Of course anybody that can grow corn is very happy with the near \$4.00 price tag for a bushel of corn. Machinery and fertilizer dealers are happy as well—if they have inventory to sell. As corn prices have risen, other crop prices have had to follow to buy acres. In the more arid regions that cannot grow corn, growers can take advantage of higher wheat and barley prices driven up by the rising price of corn.

As much as I would like to ignore it, we are starting to see some groups in the agricultural sector become concerned about the high price of corn. The cattle, hog, and poultry industries are becoming concerned about the price of corn and their lobbyists are promoting an end to ethanol subsidies. Slaughter weights of both hogs and cattle are down due to the price of corn. The slaughter of both cows and sows are up indicating a reduction in production capacity of these sectors.

My feeling is the price of corn will have to stay high for the foreseeable future. Billions of dollars are being put into the construction of new ethanol plants. Investors will not want to see these plants moth balled. Both the Democrats and Republicans seem to support renewable energy. Some of the oil producing countries have become concerned about our increasing reliance on ethanol over their high priced crude oil. While I think the days of \$1.80 corn are gone, I do feel sorry for livestock producers that are being squeezed. At the same time I don't feel any sympathy for the oil sheiks that will sell us less barrels of oil. I guess they might have to cut back on their gold lined palaces.



BOB DEUTSCH
PRESIDENT
SOIL SCIENTIST/CCA

SOUTHERN TRENDS

It sure looks like corn acres will be up in 2007, along with all the costs associated with growing corn. Hopefully corn yields will be higher as well. Many factors contribute to higher corn yields and a major factor is plant available moisture. At this time, most of our area is on the short side of stored soil moisture, so we'll have to rely heavily on growing season rainfall. With the increase of corn acres also comes an increase in soil sampling. We are geared up and ready for these samples. Please give me a call if you need any supplies or equipment or need help with your AGVISOR program.

Have a great spring and "Be Safe"!



RICHARD JENNY
AGRONOMIST/CCA