

AGVISE

LABORATORIES

SPRING 2015

SOUTHERN TRENDS

Last fall, our Benson, MN lab was on track to break our all-time record for annual soil sample volume, but a 12" snowstorm on November 10 and an early freeze-up really put the brakes on the soil sampling and fertilizer application. Looking at the soil samples summaries from 2014, the trends show continued increases in precision samples (grid or zone) as compared to conventional composite samples for the past 7 or 8 years.

Another soil sampling trend for our Southern area is the continued increase in "early-summer" soil sampling. 2014 was the biggest year on record for early-summer (late-May through early-July) soil sampling. The vast majority of this sampling is topsoil grid sampling in southern Minnesota and eastern South Dakota. It is now a common practice to soil sample in an emerging/early growing soybean crop for the upcoming

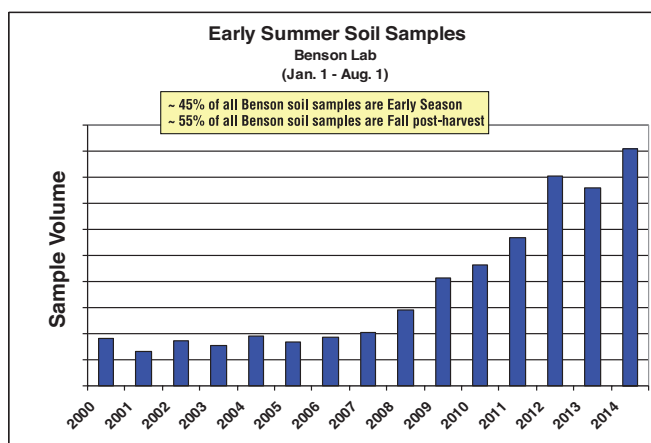
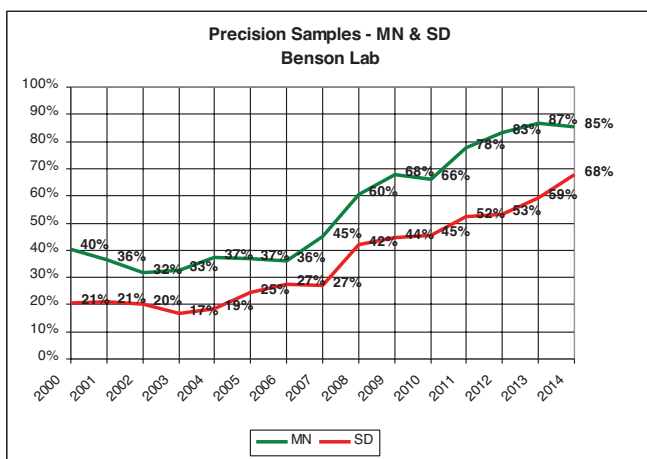
corn crop. Research has shown that early-summer samples are highly correlated to post-harvest fall soil samples. There are many advantages to early-summer sampling including high quality samples, having the soil test information with lots of time to prepare VRT application maps in the summer and being able to start applying P & K fertilizer right after the soybeans get harvested.



RICHARD JENNY
AGRONOMIST/CCA

Agronomic Information - Educational Articles

With so much misinformation related to soil testing presented at grower meetings this winter, we have added more educational links to our web site (www.agvise.com). We have added some links to topics of Base Saturation, Cation Exchange Capacity and Cation Ratios. These links are to sources of information from around the U.S. and the world. If you or your growers want to learn more about these topics go to www.agvise.com, click on "Agronomic Information" then click on "Educational Articles" and then choose "CEC and Cation Ratios."



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Soil Health Testing

Soil health is a hot topic right now at many university and industry meetings. Over the past 30 years AGVISE has offered new soil testing methods to our customers as they are developed by researchers. Two examples are the soil chloride test in the 1980's and soil carbonate test in the 90's. Right now there are a couple of soil health methods that are being evaluated by researchers and industry.

AGVISE has been offering the CO₂ burst (Solvita) test for the past two years and we are now offering the Haney suite of tests as well. These new testing methods are trying to include the biology of soil along with traditional soil testing methods to improve fertilizer recommendations.

Right now it is hard to know how these new "Soil Health" tests might be used in production agriculture in the future. Soil health can be defined in several ways. One thing we can all agree on are the basic components of soil health. One component of soil health is reducing soil erosion to keep the soil in place. Reducing tillage is another component of soil health which allows the biology to not be disturbed. Having plants growing on the soil as long as possible each year, allows the biology to be more active for more days each year. We also know that growing different crops (various grasses and legumes) along with cover crops allows the biology of the soil to be more diverse (bacteria vs fungi etc.). All of these practices are recognized as components of soil health.

The million dollar question is will the soil health testing methods being developed right now be correlated with long term yield increases and farmer profitability. The jury is still out on that question. For the next several years, the NRCS is



Photo courtesy of USDA.

evaluating the Haney suite of tests as an enhancement in the CSP program. At the same time, several university researchers are evaluating the Haney and Solvita tests to determine if these tests will help growers make better fertilizer decisions. Right now we can use these soil health tests to compare fields with different tillage practices, rotations and cover crops history. In a few years, we will have research from several regions which will help us know if these tests can help us make better fertilizer recommendations for farmers. AGVISE is currently offering the CO₂ burst (Solvita) biological activity test and the Haney suite of tests. Hopefully future research will show us how these tests or other tests not even thought of yet, will help us make better fertilizer recommendations for farmers everywhere.

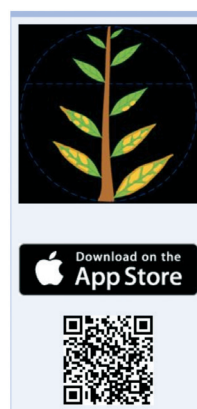
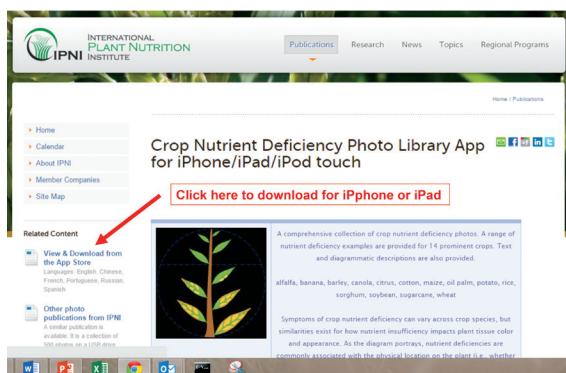
IPNI - Crop Nutrient Deficiency Symptom App

Need another tool to remind you what nutrient deficiency symptoms look like on your crops and what the function of each nutrient is? IPNI has an app for iPhones and iPads that is a new techy tool for agronomists.

This app is not that easy to find on the App store, so here is the easiest way to find it. Do a search on your browser for

"Crop Nutrient Deficiency Library App." This will bring you to a page on the IPNI web site (see figure below). Then click on the "View and download from the App Store."

This is a great tool for beginner and experienced agronomists alike. In the field it can help to remind us of the function of each nutrient and shows us deficiency symptoms of most nutrients on 14 different crops. This will be a great training tool for scouts as well, since they will always have their devices with them in the field when scouting.



CEC and Nitrogen “Holding Capacity” — Is There a Simple Rule?

An idea being promoted at some farmer meetings is that a soil can hold 10 lbs of nitrogen for each millequivalent (meq) of CEC. Lets put this idea in the category of urban legend. This legend would have you believe that a sandy soil with a CEC of 11 would safely hold 110 lb/a nitrogen on the cation exchange sites. The truth is that all the ammonium from many common fertilizers will be held on the soil cation exchange site for a short time, until it converts to the nitrate form (This conversion can happen as fast as 5 days). The ammonium ion (NH_4^+) has a positive charge allowing the soil, which has a negative charge, to hold the ammonium until it is converted to the nitrate form. Guess what? When nitrogen fertilizer has converted to nitrate form, a soil does not “hold” any nitrogen because they both have a negative charge. The nitrate anion is free to move with water in the soil profile. Where the water goes, the nitrogen will follow.

That said, soil CEC can provide a good estimate of soil texture. (See table below). A low CEC soil indicates the soil has a sandy texture while a high CEC indicates the soil has a high clay content and is likely fine textured.

Estimated Texture Based on CEC	
CEC Range	Approximate Texture
1 to 10	Sands
10 to 20	Coarse Loams
20 to 30	Fine Loams
30+	Clays/Clay Loams

The soil texture determines the amount of water held by a soil and how fast it moves through the soil profile. So 2 inches of rain on a low CEC soil (CEC <10) will leach nitrate nitrogen deeper in the profile than a soil with a high CEC soil with lots of clay.

A sandy soil that has a CEC of 7 meq will not hold 70 lbs of nitrogen. A few inches of rain will move the nitrogen deep into the profile as illustrated in the table. If you apply 100

lbs of nitrogen to a soil with a CEC of 7, 70 lbs will not stay attached to the soil while the other 30 lbs will leach. Once the N has converted to nitrate, all 100 lbs of nitrogen will move down in the profile. So this urban legend is busted. When making decisions on how much N can safely be applied to a soil, you need to consider soil texture (CEC), drainage (well or poorly drained) if the field is subject to flooding, time of year for application, type of placement (band vs broadcast), etc. There is no easy rule that will work in all situations

For many years, AGVISE staff of experienced Agronomists and Soil Scientists have suggested growers should split apply spring nitrogen to light textured fields with low CEC (<10) because the risk for leaching nitrogen is high.

In summary, the CEC provides useful information on soil texture and water movement in the soil.

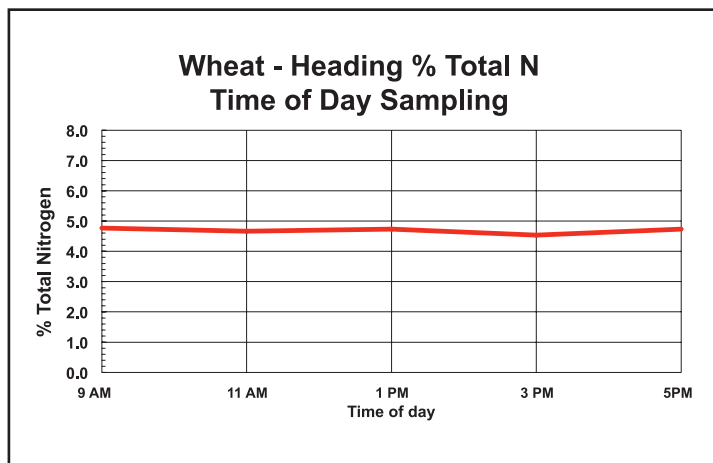
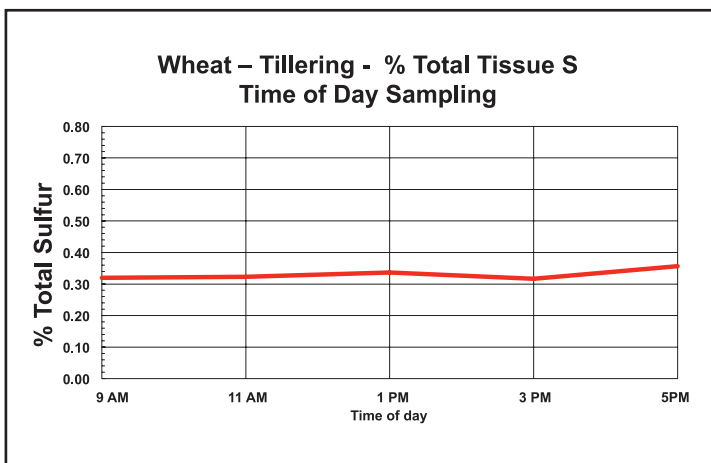
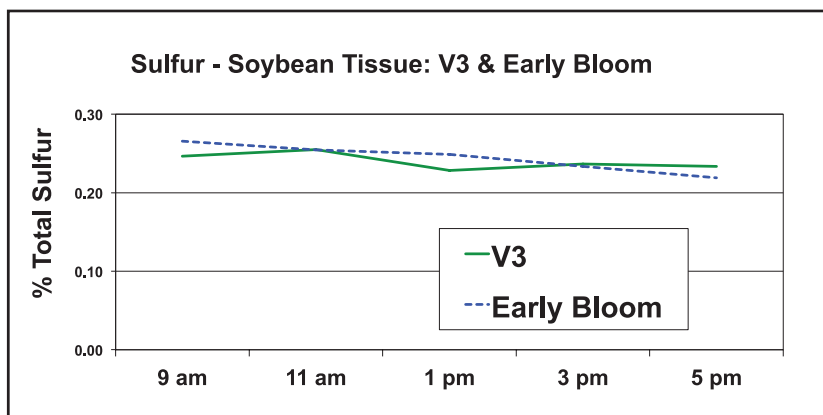
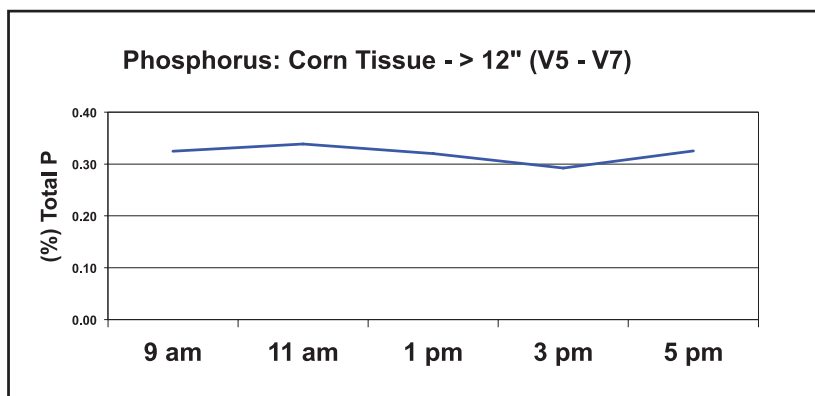
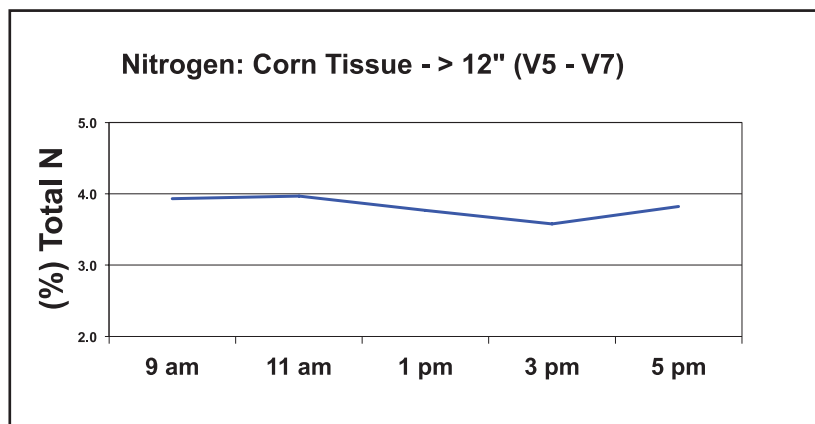
1. CEC will not tell you how much nitrogen the soil will “hold.” Ammonium based fertilizers convert quickly to nitrate N in the soil and the nitrate anion is negatively charged and will not be held on the soil which also has a negative charge.
2. The CEC will provide a good estimate of the soil texture.
3. The CEC can aid in decisions regarding the need for split applications or side-dressing crops like corn.
4. The next time somebody tells you there is magical formula that calculates the rate of nitrogen fertilizer that can safely be “held” on a low CEC sandy soil, ask him how much of his money he is willing to give you if the N is lost to leaching?

Approximate Wetting Depth		
Texture	2" Rain	4" Rain
Sand	34	69
Sandy Loam	18	37
Loam	13	27
Clay Loam	11	23



Best Time of Day for Tissue Sampling?

Plant tissue analysis has increased greatly in the past 5 years. Tissue nutrient analysis is a very useful tool for trouble shooting problem areas in fields when used with a soil test. Agronomist often ask our staff if there is a best time of day to collect tissue samples? We searched for research on this topic and did not find much information. To give our customers more information, we did a demonstration project last summer. This project included collecting plant samples at 9AM, 11AM, 1PM, 3PM and 5PM. Tissue samples were collected from corn, soybeans and wheat at various stages of growth. All samples were collected in triplicate for this demo project. The figures show a few examples of nutrient levels from tissue samples collected at different times of day from various crops. As you can see from these figures, there are no significant differences in the nutrient levels when samples are collected between 9AM and 5PM. Please call if you have questions.



Online Sample Submission - You Get It! _____

Submitting soil samples online is a feature that most AGVISE customers are either doing now or taking a serious look at. Last fall we passed 1,000,000 samples submitted online! That's pretty good considering we only introduced this new way to submit samples three years ago!

Once customers start submitting samples online, they realize the benefits of no forms to fill out, no mistakes in the Grower name and Field information on their soil test reports, time saved and more! When using the online system you only have to enter the grower and field information one time (we can help you export data from last year to get you started).

Another nice feature is the setting up the "Crop Default Settings." To speed up online submission you can set some of the common tasks such as: Previous Crop, Crop Choices, Yield Goals, P & K Guidelines and Sample Depth. This will save you clicks when you submit a sample online! You can

also insert your "logo" into AGVISOR so it will be shown on each soil test report.

You can create a "Dealer Default" test option for both your Grid/Zone samples and for your Conventional Composite samples. Just call John or Richard and they will help you set up the default analysis package you want. Once this is set up, you can just click on "Default analysis" when submitting samples online and select the package you want with one click! All these features add consistency and speed up your sample submission process. If you want to get set up for online submission give Richard Jenny or John Lee a call. They will walk you through the process one step at a time and help you import your grower and field information from last year so you don't have to start from scratch. It is easy to get started!

Surety Maps Now Available in Canada

With your comments and suggestions, we continue to make improvements to the AGVISOR program each year. AGVISE has been working with Surety mapping from Agridata inc. for many years. This past year, we worked with Surety mapping to link field maps to soil samples in our online AGVISOR program (see soil report with field map). Initially, linking maps to fields was only available in the U.S. and now we can offer this service to our Canadian customers as well. To link field maps to your online soil samples, you must have a subscription to the Surety Mapping program. If you sign up for the Surety mapping through the AGVISOR program, you will save \$100 from the price listed on the Surety web site. If you have any questions on the Surety mapping program or want some help walking through the process please give John Lee a call at 701-587-6010.



**Christi Arndt -
New Benson
Office Manager**

We would like to introduce Christi Arndt as our new office manager at our Benson MN laboratory. Christi has been working in our Benson office for about a year. We are very excited to have Christi as our office manager. We would like to wish a happy retirement to Connie Lee from our Benson, MN lab. Connie was our office manager for 23 years and will be greatly missed.

Field Map linked to Online Soil Sample

 Soil Analysis by Agvise Laboratories (http://www.agvise.com) Northwood: (701) 587-6010 Benson: (320) 843-4109		SOIL TEST REPORT FIELD ID: Grant Field SAMPLE ID: Zone 1 FIELD NAME: down by the river COUNTY: Grand Forks TWP: Pleasant view SECTION: 33 QTR: NW ACRES: 147 PREV. CROP: Soybeans		
SUBMITTED FOR: John Grower 1234 Big Crops Avenue Green city, ND 58201		SUBMITTED BY: LE0002 JOHN LEE 698 EVERGREEN DR. GRAND FORKS, ND 58201		REF # 652362 BOX # 0 LAB # NW35216
Date Sampled		Date Received 08/12/2013		Date Reported 8/12/2013
Nutrient In The Soil 0-6" 10 lb/ac		Interpretation Low Med High		
1st Crop Choice Corn-Grain		2nd Crop Choice Soybeans		3rd Crop Choice Wheat-Spring



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PRESIDENT'S CORNER

Spring planting season is fast approaching with field work already starting in some locations. A warm spell in March really got the blood pumping for farmers in this region. This year, the optimism of a new growing season is tempered by the pessimism of low commodity prices. Lingering concerns for lack of moisture in the upper Midwest also has many farmers on edge. In spite of everything, farmers are optimistic by nature and will do everything in their power to raise a good crop. Each year our staff here at AGVISE tries to help growers make the best decisions on their fertilizer inputs. With lower crop prices and input costs holding their own, farmers will need to make sound decisions to be profitable this year. AGVISE is here to help you and your farmers make those decisions. We hope you all have a profitable 2015!



BOB DEUTSCH
PRESIDENT
SOIL SCIENTIST/CCA

NORTHERN NOTES

What winter? It probably won't be the warmest or driest winter on record, but it might be in the top ten! That's great because the previous two winters were very cold and snowy up north! Hopefully spring gets an early start this year. With predictions of a dryer than normal summer, it would be great to get the crop in early.

Spring soil testing is already going in many areas. In fact many northern customers soil sampled through the winter! The AGVISE HD probe was really put to the test by customers on frozen soils this winter and did very well. The HD probe is made of Chromoly steel and was designed for hard dry soil and frozen soil conditions.

We will be testing out a new remote control switch for our electric/hydraulic sampling system this year. Having a remote control will be great because there will be no wires to the power unit and your fingers will not have the fatigue of the regular push button switch. We should be able to add the remote control to any of the sampling systems we have sold in the past 5-8 years.

We are ready to provide you with the highest quality data and great turn around this spring. If you need any supplies or sampling equipment, please give us a call or place the order on our web site (www.agvise.com). We hope you have a great spring season!



JOHN LEE
SOIL SCIENTIST/CCA