

AGVISE

LABORATORIES

WINTER 2011

NORTHERN NOTES

With over 6 million acres unseeded in North Dakota and many more on the prairies in Canada, this season was a struggle up north. Even in areas where most acres got seeded, there were issues with wet soils early in the season and drought at the end (crazy weather). Crop yields and quality were all over the board. Luckily, the weather cooperated for harvest and most fields are now prepared for seeding next year. Soil nitrogen levels were quite variable due to many weather factors and management factors (see “Do You Feel Lucky?” on page 3).



JOHN LEE
SOIL SCIENTIST/CCA

Soil testing this fall went at a record pace! There were a few days in October when the Northwood lab received over 4,000 samples. That means we had to dry and grind over 10,000 sample bags that day because most samples have at least two sample depths (0-6 & 6-24"). We are planning to have more daily lab capacity for next fall.

Having the right sampling equipment was critical this fall. If you had the AGVISE Heavy Duty—oversize sample probe and tip, sampling wet soils wasn't so bad. If you didn't have the right equipment, you probably pulled out most of your hair!

We have a great line-up of topics and speakers at our soil fertility seminars in January (see seminar article). We hope to see you all this winter at meetings around the region. I hope everyone had a safe fall season and now you can focus on friends and family through the holidays!

AGVISE Soil Fertility Seminars January 3, 4, 5

AGVISE soil fertility seminar dates and locations are set. The dates and locations for our 2012 Soil Fertility Seminars are listed below and a registration letter was sent to all AGVISE customers in early November. Please make sure you register early for these seminars if you plan on attending. Space is limited and there is usually a waiting list. An email was also sent to everyone on our mailing list in mid-November to let people know about these seminars. If you received this newsletter, you are on our mailing list, but you may not be on our email list. If you want to receive future emails on our seminars, newsletters and technical information, please call Teresa at our Northwood office and give her your current email (701-587-6010). To register for our Soil Fertility Seminars, call 701-587-6010 and ask for Shelly.

Fallow Syndrome (Don't Skimp on Starter P!)

Several million acres went unseeded in the northern plains this year due to excessive rainfall and flooding. One nutrient issue that comes along with flooding is called “fallow syndrome.” “Fallow syndrome” is primarily a phosphorus deficiency caused by a lack of mycorrhiza fungi in the soil. Mycorrhiza (Vesicular arbuscular mycorrhiza or VAM) is a beneficial fungi found in most soils and needs living plant roots to flourish. This fungi has a symbiotic relationship with plants and is especially important for grass crops like corn and wheat. VAM fungi act like an extension of the plant roots, to help them absorb more nutrients like phosphorus and zinc.

The population of these fungi goes down rapidly in a year with little plant growth. In 2011, growers did their best to control weed growth on acres that did not get seeded. If the weed control was good during the summer, these

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Seminar Locations

CEU Credits applied for

January 3 — Granite Falls, MN	1.0 - SW, 4.0 NM
January 4 — Watertown, SD	1.5 - SW, 4.0 NM
January 5 — Grand Forks, ND.....	1.5 - SW, 4.0 NM
March 14 — Carman, MB	To be determined

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“AGVISOR Lite” Plus Online Sample Submission

AGVISE made major advances to our web-based online services this fall. We introduced the online AGVISOR Lite program for reporting soil samples along with plant tissue and manure samples. Late in the fall, we also added a way to export billing information for soil samples from AGVISOR Lite. Many customers like being able to export the billing information for soil samples to make their billing process easier. If you want to give AGVISOR Lite a try, go to www.agvise.com and sign on with your account number and password. (call if you need the password).

“AGVISOR Lite”, our online soil sample reporting software will eventually replace our AGVISOR Gold software. Many of the same functions in Agvisor Gold have already been added to AGVISOR Lite, including:

- Printing soil test reports (single or multiple)
- Creating pdf reports and an easy way to email to growers
- Exporting soil test data in customized formats
- Viewing Soil Test reports from multiple account numbers with one login
- Editing grower/field information
- Changing yield goals/crop choices/guidelines.

Soil Sample Submittal System: The online way to

submit soil samples was tested in 2010 and is being used by many customers now. This has worked very well and clients like how simple it is and how much time it saves. The online submission has also eliminated spelling errors that used to drive everyone crazy. To speed up the process even more, you can use the default setting for Previous Crop, 3 Crop Choices/Yield Goals/Guidelines and sampling depths. This eliminates the need for the hand written paper forms for soil and SCN samples. The best way to start using the online submittal system is to enter the Grower and Field information in the online program this winter. Having your information in the system before sampling starts will make the transition very smooth for you and your staff. You can add and edit your growers and fields as you wish at any time. When you are ready to actually “Submit Samples to Agvise”, then you’ll go through the process and print out the barcode reference number sticker forms we provide at no charge. These stickers are placed on the sample bags (a laser printer is required because inkjet ink smears too easily). If you haven’t used the system yet and would like to try it out, then just insert a new Grower called “Test Grower” and Field “Test Field” and submit some samples to get the feel of it.

Plant Tissue and Manure: Reports can also be viewed on our online system. We are planning to have plant sample submission for the coming year!

Fallow Syndrome cont...

fields are set up for “fallow syndrome.” The population of VAM fungi decreased during the summer and will be low next spring when crops are planted. If the unseeded acres had cover crop seeded on them early in the summer, the VAM fungi population is probably OK and “fallow syndrome” should not be an issue.

For the unseeded acres that were kept free of weeds with chemical control or tillage, “fallow syndrome” must be considered. Fallow syndrome mainly affects corn and wheat. The cure for fallow syndrome is a high rate of P fertilizer placed near or with the seed regardless of the P soil test level. Placing P fertilizer in a band near the seed is a common practice for wheat growers. They just have to make sure the P rate with the seed is high (be sure to apply a safe rate).

Corn growers who already place starter P fertilizer with or near the seed, should not have any issues with “fallow syndrome.” They just need to increase the rate to about 30 lb/a P_2O_5 in their starter. A rate of 10 gallons of 10-34-0 would be the limit for seed placed fertilizer with corn seed on 30" spacing. Using 2-3 gallons of a low phosphorus concentration liquid fertilizer will not be enough P to avoid fallow syndrome. If a corn grower does not have the equipment needed to apply a high rate of P fertilizer in a band near the seed at planting, “fallow syndrome” will likely cause yield loss. Research has shown that broadcasting P fertilizer (even a high rate) will not fix the “fallow syndrome” induced P deficiency. A high rate of starter P is required. Hopefully we will have an early dry spring in the northern region next year and we won’t have to worry about issues like this.

Farewell!

Eileen Berg is retiring from her position with AGVISE. Eileen has been a secretary/receptionist with AGVISE for 21 years. Through the years, many customers have commented on Eileen’s happy nature and that she always did her best to help them with whatever they needed. Everyone at AGVISE thanks Eileen for her many years of dedicated service. We know she looks forward to spending more time with her family and “cheering” her grandchildren on from the bleachers!



Eileen Berg

Do you feel lucky?

We have all seen the Clint Eastwood (Dirty Harry) movie when he asks the punk if he feels lucky (while staring down the barrel of a 357 Magnum). This is the same feeling growers should get if they wonder whether they should soil test each field or not this year (Do you feel lucky?)

Soil testing went at a record pace this fall. As the fall season progressed, it became obvious that soil nitrate levels were extremely variable from field to field. The best way to show people this variability is to use the soil test data to tell the story. AGVISE Laboratories in Northwood ND has tested over 160,000 soil samples this fall from all over the region. The test results from these samples show that there is more variability than we have seen for many years. This includes cropped fields and fields that were not seeded this year (about 6 million acres in ND alone). Everyone knows the reasons why fields have different levels of soil nitrate in the fall (even fields within a mile or two). The list includes, different crop yields, different N fertilizer rates, more or less N lost to leaching or denitrification, more or less N gained from soil OM mineralization, differences in weed control, differences in tillage, differences in previous crop, manure applications

etc. etc. The list of reasons is very long. Each region experienced different environmental conditions, so the data is broken down by zip code or postal code area. The data in the table is from areas that had the highest amount of unseeded acres in 2011. The first table reflects the nitrogen soil test data from over 30,000 wheat fields tested this fall. The second table reflects the nitrogen soil test data from over 8000 fields which were not seeded in 2011 (fallow/unseeded). In the “fallow” table, it is obvious that the soil N test levels vary a lot from field to field this fall. There is

also a large percentage of fields testing higher than 60 lb/a, which reflects nitrogen that has accumulated in the soil profile due to fallow practices such as controlling weed growth through the season, and nitrogen released from the soil following summer tillage. The value in each column is the percentage of fields testing in each range of soil nitrogen (Example: 18% of wheat fields tested from 0-20 lb/a for the 582 zip code area). If you have any questions on the data in these tables, please give us a call.

Wheat Fields in 2011 (30,000 wheat fields tested so far)													
Zip code	582	583	587	584	586	588	567	565	ROG	ROA	ROL	ROK	ROH
Soil N range (0-24" total)													
0-20 lb/a	18%	16%	11%	10%	12%	30%	20%	27%	32%	27%	25%	11%	14%
21-40 lb/a	49%	46%	43%	38%	40%	36%	49%	46%	41%	31%	49%	38%	41%
41-60 lb/a	20%	24%	26%	29%	30%	19%	19%	18%	15%	21%	15%	27%	21%
61-80 lb/a	8%	9%	11%	13%	12%	9%	7%	6%	6%	12%	6%	9%	11%
81-100 lb/a	3%	3%	5%	6%	3%	4%	3%	2%	2%	5%	3%	8%	4%
>100 lb/a	2%	2%	4%	4%	3%	2%	2%	1%	3%	4%	2%	7%	9%
Fallow (unseeded fields) (8200 fallow fields tested so far)													
Zip Code	582	583	587	584	586	588	567	565	ROG	ROA	ROL	ROK	ROH
Soil N range (0-24" total)													
0-20 lb/a	8%	15%	7%	15%	13%	11%	10%	18%	1%	11%	1%	4%	2%
21-40 lb/a	22%	19%	22%	26%	21%	27%	24%	31%	8%	16%	11%	8%	19%
41-60 lb/a	26%	22%	25%	25%	26%	39%	25%	18%	23%	24%	15%	13%	27%
61-80 lb/a	21%	17%	19%	15%	20%	16%	20%	16%	30%	14%	22%	18%	18%
81-100 lb/a	12%	11%	13%	10%	8%	5%	12%	6%	16%	18%	16%	15%	13%
>100 lb/a	11%	16%	14%	10%	12%	3%	9%	10%	22%	17%	35%	43%	20%

Soil Testing is the first step towards a successful 2012!

President's Column cont...

history of potash (potassium chloride) application.

The data from soybeans indicates fewer nutrient issues than either wheat or corn. The two nutrients with the highest frequency of samples testing below the critical level are zinc and copper. I have seen very little research on soybean yield responses to either zinc or copper. It is possible that the critical level for these nutrients needs to be updated with new research. I do not know what impact, if any, these levels of zinc or copper will have on yield.

In summary, we need to be aware that a significant percentage of tissue samples tested below the critical levels for macronutrients nitrogen, phosphorus and potassium. Eliminating deficiencies of these macronutrients should be the first priority. There are also some issues with sulfur, chloride, zinc and copper which should be addressed once the problems with N, P and K have been resolved.

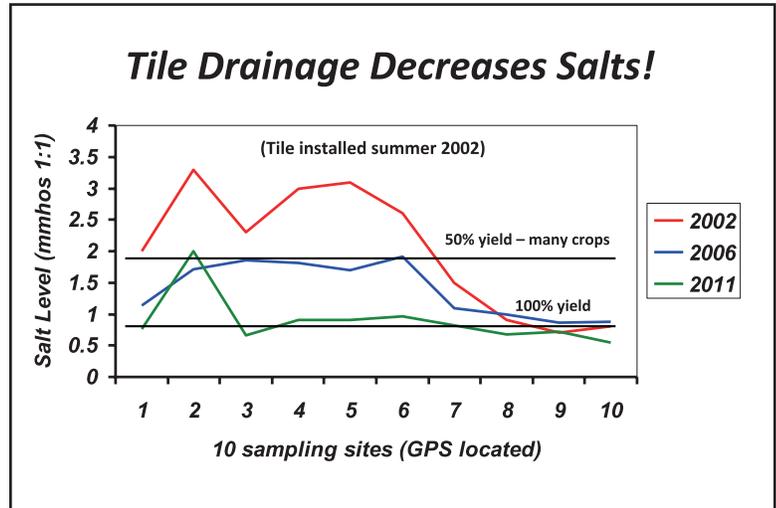
Percentage of Plant tissue samples testing below critical levels for several nutrients

Nutrient	Corn		Wheat		Soybeans	
	Below	Above	Below	Above	Below	Above
	Critical	Critical	Critical	Critical	Critical	Critical
	Level	Level	Level	Level	Level	Level
Nitrogen	26.7%	73.3%	16.3%	83.7%	8.1%	91.9%
Phosphorus	26.6%	73.4%	27.0%	73.0%	4.2%	95.8%
Potassium	19.2%	80.8%	18.0%	82.0%	9.2%	90.8%
Sulfur	29.3%	70.7%	7.5%	92.5%	1.9%	98.1%
Zinc	31.6%	68.4%	33.8%	66.2%	12.1%	87.9%
Copper	6.7%	93.3%	17.6%	82.4%	17.2%	82.8%
Chloride	NA	NA	43.2%	56.8%	NA	NA

Salinity Problems?—Tile Drainage Works!

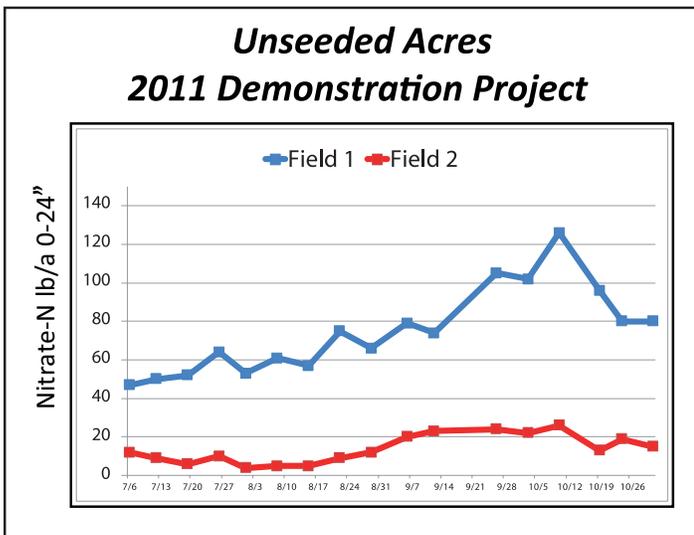
The past 15 years have been historically wet in many areas of the northern Plains. The result of this high rainfall period has been water tables moving closer to the soil surface. Having a water table too close to the soil surface results in water being wicked to the surface. When the water is evaporated away, the salts remain on the soil surface and accumulate over the years. Many farmers will call these “White Alkali” areas. One proven way to improve these salty soils is to lower the water table so that the salts cannot be wicked to the soil surface. Some ways to reduce salt accumulation at the soil surface include improving surface drainage, maximizing plant growth on the area and installing tile drainage.

In 2002, AGVISE established a demonstration project on a newly tile drained field. Our staff of Soil Scientists and agronomists thought it would be interesting to see how long it would take for the salt level in a tile drained field to be reduced enough to improve crop yields. 10 points were located by GPS in the tiled field demonstration site and the salt level has been tested at each GPS point for the past 10 years. The salt levels shown in the figure are for 2002, when the tile drainage was installed, 2006 and the fall of 2011. As you can see, the soluble salt level has greatly decreased in the many sites that tested higher than 1.0 mmhos/cm (1:1 method). Of course the sites that were relatively low in salts initially still have low salt levels. Yields have increased greatly on this field as the salinity levels have decreased. In particular, the soybean production on this field has improved. By lowering the soluble salt level in this field, the problem with iron chlorosis in soybeans is much less of an issue. While tile drainage is not the only answer to salinity problems, it is clear from this demonstration project, that tile drainage is a proven way to lower the soluble salt level in the soil and increase crop production over time.



Unseeded Acres—Nitrogen Variability!

With several million acres not seeded in the plains this year, there has been a lot of interest in the soil nitrogen status of fields that did not get seeded. To give some insight on how the soil nitrogen levels changed during the growing season on these fields, AGVISE did a demonstration project on two fields in the Northwood ND area. A site in each field was sampled each week, starting in early July. Even though these fields were only 2 miles apart, you can see in the figure, that the soil nitrate levels through the season were quite different. The grower practices are the reason the soil nitrate level in these fields are so different. Field one had chemical weed control in early June and was tilled in July and August. As you can see, having good



weed control and tillage resulted in quite a bit of soil nitrate in the soil profile. Controlling the weeds reduced the amount of soil N removed from the soil, and each tillage created a flush of microbial activity and nitrogen mineralization, adding to the soil nitrate in the soil profile.

Field two did not have chemical weed control until mid-July and the weed growth was mowed in August. There was no tillage on this field all summer and fall. Weed growth used all of the soil nitrogen in the profile and there was no tillage to stimulate nitrogen mineralization. The result was not very much soil nitrate in the profile at the end of the season.

This demonstration project is a good example of why unseeded fields in the same area can have soil nitrate levels that are very different. The management practices will have a large effect on the amount of soil nitrate left in the soil profile this fall.

AGVISE Giant Pumpkin Winners 2011

AGVISE giant pumpkin contest had great results again this year. The weather in the Midwest wasn't the best this year but some areas did grow some monsters. The world record was broken this summer by Jim and Kelsey Bryson from Ormstown, Quebec, Canada with a 1818.5 lb giant. The new record was 8 pounds more than the 2010 record set by Chris Stevens from Richmond Wisconsin. The winners for the 2011 AGVISE contest are shown below. Thanks to each of them for the work they put in and the great pictures they sent.

Adam Johnson, Santiago, MN.....919 lbs, 1st prize \$100.00

Rick Swenson, Fergus Falls, MN 520 lb, 2nd prize \$75.00

George Bilinsky, Winnipeg, MB..... 370 lbs, 3rd prize \$50.00

Thanks to everyone who participated but did not get a giant this year. I know how much work it is to try and grow a giant pumpkin, but there are many things that can and do go wrong at times. Sometimes you just have to be lucky. This year I lost all but one plant to frost, excessive rainfall and wind damage. An early frost this fall also cost me some precious pounds (yes, I am officially whining now). I did manage to get one 500 pounder and a 270 pounder for my efforts.

Next year it would be great if an AGVISE customer broke the world record which is now 1,818.5 lbs. If a customer was to break the record, we would devote two full pages in our newsletter to the event. One page would be a picture of the winner and his giant pumpkin and the second page would show the AGVISE soil test report he used to make fertility decisions that enabled him or her to grow the world record pumpkin!



First Place, Adam Johnson, 919 lbs



Second Place, Rick and Erin Swenson, 520 lbs



Third Place, George Bilinsky, 370 lbs (Kalyna, 4-years-old)



John Lee with 270 lbs (top) and 500 lbs (bottom)

PRESIDENT'S CORNER

The 2011 growing season was a very busy plant analysis season for AGVISE. In this article, I would like to share some summary data with you. Table 1 is a summary of the plant analysis results for corn, wheat, and soybeans. Only nutrients with a significant percent of the samples testing below the critical level have been included in the table. In the case of wheat and corn, the table is a summary of three different growth stages. The data may be skewed to the low side because some samples in this summary may have been taken to diagnose visual symptoms of nutrient deficiency observed in the field.

The corn data indicates we had a significant number of fields testing low in nitrogen, phosphorus, potassium, sulfur and zinc. The large number of tissue samples testing low in nitrogen may be partially due to the loss of nitrogen from both fall and spring applications. The above normal precipitation events certainly resulted in both leaching and denitrification of nitrogen in many of the fields.

The wheat tissue data shows many of the same trends noted in corn. A significant number of fields tested low in nitrogen, phosphorus and potassium. Sulfur does not appear to be as much of an issue on wheat as corn. The number of wheat tissue samples testing below the critical level for zinc is somewhat surprising to me. The large number of wheat tissue samples testing below the critical level for zinc could be due to the fact most wheat tissue samples come from areas where zinc fertilizer has never been applied. Chloride is another issue in the wheat tissue samples we tested in 2011. 43% of the wheat tissue samples tested below the critical level of chloride. This number again should not be surprising as many of the wheat fields from our western trade area do not have a



BOB DEUTSCH
PRESIDENT
SOIL SCIENTIST/CCA

SOUTHERN TRENDS

Plain and simple, grid and zone soil sampling has increased greatly the past few years. To give you an idea how much sample volume has increased at our Benson lab, we tested more samples in October this year, than we tested in the whole year of 2002. Plant tissue testing and cornstalk nitrate testing have also increased rapidly as agronomists and growers want to know the nutrient status of their crops during the season.



RICHARD JENNY
AGRONOMIST/CCA

This fall's sampling season was similar to last fall in that once the soybean harvest got going, soil sampling went like gangbusters and didn't slowdown all the way through corn harvest. Our lab increased capacity in 2009, 2010 and 2011 to handle higher daily volumes. We have plans in place to increase daily lab capacity for next year as well. Our goal is still 24-48 hour turn-around, even during the busy fall season.

Another big trend is early summer grid sampling, which occurs in May, June and early July, in the planted soybean crop, intending to fall apply fertilizer for corn the following year. The benefits are excellent sampling conditions and soil core quality, relieving the fall sampling pressure and being able to apply P & K fertilizer as soon as the soybean combine leaves the field. Spring grid sampling is a "Win-Win" situation and benefits the grower, agronomist, dealer, applicator and the lab. As spring grid sampling continues to grow, the use of the Wintex1000 topsoil sampler increases as well. Many AGVISE customers have purchased the Wintex 1000 to reduce the amount of labor required and speed up sample collection.

All of the AGVISE Benson Lab hopes you have a wonderful Holiday season!

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