

NORTHERN NOTES

The widespread dry conditions across the northern trade region remind me of the severe 1988 drought. If you are not old enough to remember that drought, consider yourself lucky. As we move beyond this year, we must begin to focus our effort for next year, making it a better year for crop production.

As you know, your starting point is a current soil test. Following a dry year, it is critical to collect 24-inch soil samples to determine the amount of residual soil nitrate-nitrogen that we can count on for next year's crop. Since our soils freeze in winter, the soil nitrate-nitrogen found in fall will stay around through spring, so we can reduce the nitrogen fertilizer rate we need to apply for next year and save producers money.

To make a better decision on nitrogen fertilizer rates, zone soil sampling is key. Some zones in the field with better water holding capacity may have produced a decent crop yield, and these will have lower residual soil nitrate-nitrogen. Yet, other zones may have had very poor crop growth and yield, leaving very high amounts of soil nitrate-nitrogen remaining. Soil sampling based on productivity zones enables you to apply the correct amount of nitrogen fertilizer in each zone across the field.

Historically, drought years create a high demand for soil testing. AGVISE has a full inventory of soil sampling equipment and supplies to help you obtain high-quality soil samples and collect them efficiently. If you need to upgrade your equipment or add another soil sampling system before fall, we are ready to help. We have extended our Fall Special on hydraulic soil sampling systems (see right for details).

If you need any soil sampling equipment or supplies, please give our staff a call. We hope you have a safe fall harvest and soil sampling season!



JOHN LEE
SOIL SCIENTIST, CCA

Fall Special: Hydraulic Soil Sampling Kit (24 inch)

AGVISE Laboratories is offering a fall special on the first 50 Hydraulic Soil Sampling Kits (24 inch) sold this fall. You will receive \$200 credit on soil analysis for each kit purchased. The Hydraulic Soil Sampling Kit (24 inch) is priced at \$3,100.00 USD. The kit includes a 12VDC electric-hydraulic pump, 30-inch hydraulic cylinder and mounting channel, two stainless steel soil probes (solid and slotted), two heavy-duty (HD) soil probes (solid and slotted), and a complete set of 5/8-inch, 3/4-inch, and wet-style tips for each soil probe type. The HD soil probe is ideal on hard, compacted, or frozen soils. You can view details of the Hydraulic Soil Sampling Kit (24

Continued on page 2

AGVISE Soil Fertility Seminars: January 4-6, 2022

The AGVISE Soil Fertility Seminars are back on the schedule for January 4-6, 2022. You will not want to miss the great program lineup! More details will be mailed to AGVISE customers in November. We'll be seeing you in all the old familiar places.

- January 4: Granite Falls, MN
- January 5: Watertown, SD
- January 6: Grand Forks, ND

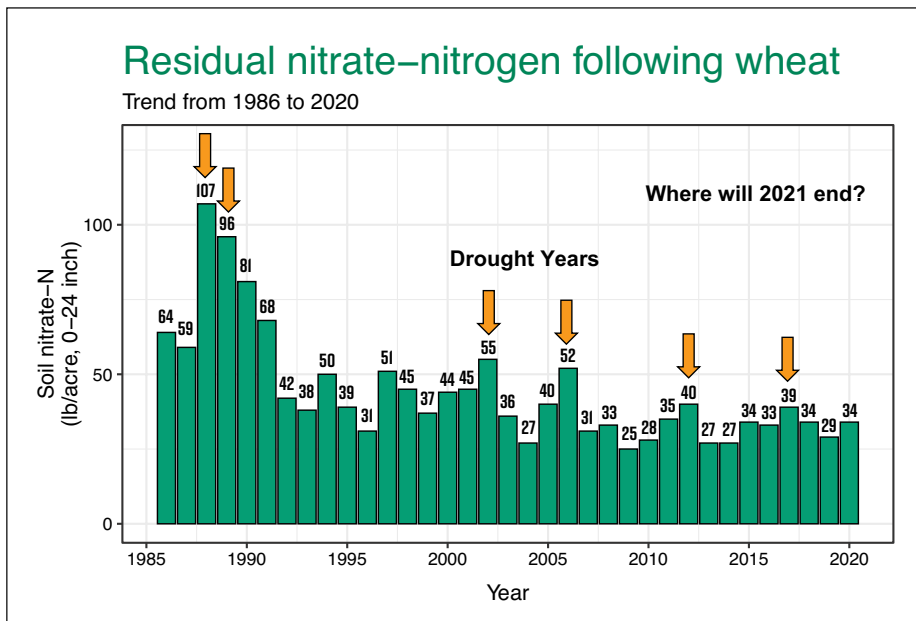
INSIDE

Soil Nitrate-Nitrogen Trends Following Drought Years	2
Online Soil Sample Submission—Still waiting to try it?	2
Corn Stalk Nitrate Test	3
Choosing the Right Soil Probe Tip for Wet or Dry Soil	3
Soil Salinity: Measure it so you can manage it	4
Soil Testing Behind the Combine	5
Postcards and Poster	5
Southern Trends	6
President's Corner	6

Soil Nitrate-Nitrogen Trends Following Drought Years

From Alberta to Iowa, the region has experienced everything from abnormally dry soil conditions to exceptional drought. In some places, the drought started in 2020 and has continued through 2021. Considering lower than expected crop yields, we expect that residual soil nitrate-nitrogen levels will be much higher than normal in many wheat, canola, and corn fields this fall. There was reduced crop nitrogen uptake and little to no soil nitrogen losses to leaching or denitrification through the growing season, which should result in nitrate-nitrogen remaining in the soil profile.

In major drought years, this is a normal phenomenon. In 1988, the average soil nitrate test across the region was a staggering 107 lb/acre nitrate-N (0-24 inch soil profile) following wheat. This is considerably higher than the long-term average around 30-45 lb/acre nitrate-N (0-24 inch soil profile). The 1988 drought was extreme, and 2021 has rivaled that in some locations. Based on previous drought years, it will be no surprise to find wheat fields with 80-100 lb/acre nitrate-N (0-24 inch soil profile) or even higher. A fall soil test is the only way to know what amount of soil nitrate-nitrogen remains in each field or management zone. This information is vital to determining the right nitrogen fertilizer rate for next year. If the soil test nitrate-nitrogen level is very high, then the nitrogen fertilizer rate required next spring will be lower, allowing producers to save on nitrogen fertilizer costs.



Fall Special Cont...

inch) on our website: www.agvise.com/product/hydraulic-soil-sampling-kit/. You can also take a look at videos of the soil sampling systems in operation: <https://www.agvise.com/installed-soil-sampling-kit-examples/>.

If you need to collect deep soil samples for deep-rooted crops like sugar beet and sunflower, we also have a 42-inch telescoping hydraulic cylinder system, which can be outfitted with an 8-HP Honda gas-powered hydraulic pump or large-capacity 12VDC electric-hydraulic pump. Please call for details on the 42-inch soil sampling systems.

Online Soil Sample Submission—Still waiting to try it?

Since 2011, AGVISE Laboratories has offered online soil sample submission through our online AGVISOR platform. Over half of AGVISE customers utilize the timesaving benefits of online submission, now having submitted over 3.2 million soil samples online. Online submission is quicker, easier, and more accurate than paper forms. In the online system, grower and field information is entered and saved within AGVISOR, so there is no more writing the same information onto paper forms year after year. You simply select the grower, field, and soil test option, then print the barcode reference stickers for each soil sample bag. You can also save default crop choices, P & K guidelines, soil sample depths, and default soil test packages to streamline the entire process.

Online soil sample submission saves time and prevents mistakes (e.g. spelling mistakes, missing information). You also can link FSA maps to each field (Surety Online Mapping subscription required). The FSA map prints on the soil sample order form and soil test report, which adds a professional touch for your clients to see on their soil test reports. For third-party soil samplers, online submission is particularly convenient because PDF sample order forms and barcode reference stickers can be emailed to the person soil sampling right away (no delays with receiving paper forms anymore). The FSA map also appears on the soil sample order form, which helps eliminate confusion for the person in the field.

Corn Stalk Nitrate Test

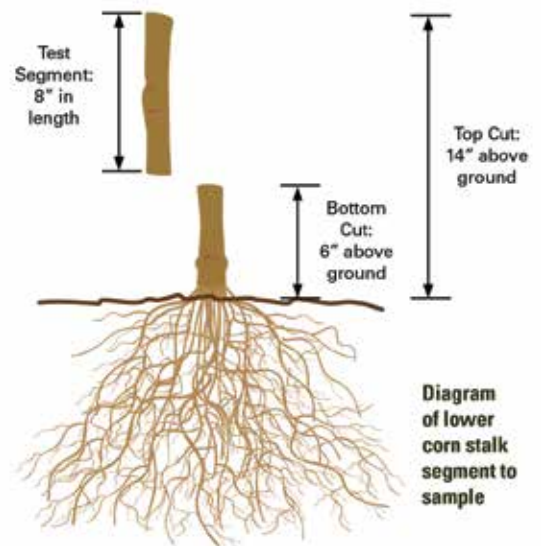
How do you score for corn nitrogen management? Each year, Mother Nature delivers different expectations for crop yield potential, nitrogen mineralization rates, and soil nitrogen losses. It is not always easy to know if you applied enough nitrogen fertilizer to maximize crop yield, or if you maybe ran short. To help you get a better handle on corn nitrogen management, the corn stalk nitrate test offers an end-of-season report card and opportunity to improve your nitrogen fertilizer plan for next year.

The corn stalk nitrate test is a helpful tool for assessing nitrogen sufficiency in mature corn stalks collected at physiological maturity (black layer, R6 growth stage). Iowa State University developed the corn stalk nitrate test and found that it has a strong relationship with soil nitrogen supply and corn grain yield (Binford et al., Agron. J. 82:124-129). If corn did not have sufficient nitrogen, the corn stalk nitrate concentration will be low (<250 ppm NO₃-N). If the corn had excess nitrogen, the corn stalk nitrate concentration will be high (>2000 ppm NO₃-N). The corn stalk nitrate test not only can tell you if you ran short, but also if you have been applying too much.

The corn stalk nitrate test is particularly useful in cropping systems with manure or corn-after-alfalfa, where a significant portion of the crop nitrogen budget comes from nitrogen mineralization. For corn silage production, it is easy to collect corn stalk samples on the go during silage harvest, making it a quick and practical tool. It is also helpful in corn-soybean rotations, where soil samples for residual soil nitrate-nitrogen are not typically collected before the soybean year. In a corn-soybean rotation, the corn stalk nitrate test might be your only opportunity to assess nitrogen management of the corn year. Take a look at your corn nitrogen management report card with the simple and practical tool that is the corn stalk nitrate test.



JOHN BREKER
SOIL SCIENTIST,
CCA, 4R NMS



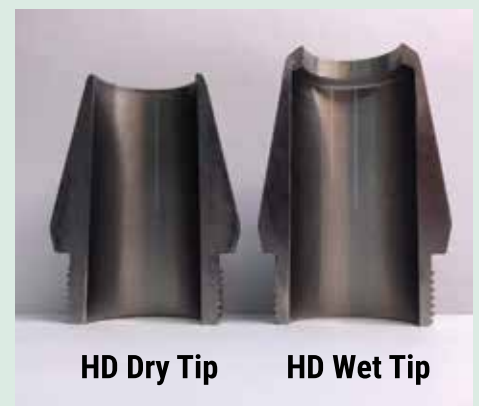
Corn stalk sampling instructions for end-of-season corn stalk nitrate test (from Iowa State Univ. Ext. Circ. CROP 3154, 2018).

COLLECTING A GOOD SAMPLE:

- Sample 1-3 weeks after black layer
- Collect 15 eight-inch stalk segments between six and 14 inches above the soil surface
- Randomly select stalks from about a one acre area that represents a larger area
- Separately sample different soil types and management areas
- Place stalks in paper bags, not plastic, for shipment to the lab
- Ship samples within one day or refrigerate until shipping

Choosing the Right Soil Probe Tip for Wet or Dry Soil

To help you collect the best quality soil samples, AGVISE Laboratories provides different soil probe and tip options for our 24- and 42-inch hydraulic soil sampling systems. The stainless steel and heavy-duty (HD) chromoly steel soil probes each have wet and dry soil probe tips for adverse soil sampling conditions. The wet tip is ideal for very wet soils, high clay soils, and even frozen soils. It has a recessed lip just inside the opening, which allows the wet soil to flow into the soil probe without smearing and plugging inside the probe body. The dry tip features a cutting edge and larger opening for easier soil sampling in hard, dry soils. If you have not tried the wet or dry tips, you really must give them a try.



Soil Salinity: Measure it so you can manage it

A dry year can really show us where the saline spots in fields are. Increased evaporation at the soil surface draws water to the soil surface, where the soil water evaporates and leaves salts behind. We have all seen ugly white salt crusts on the soil surface of very saline soils, AKA white alkali.

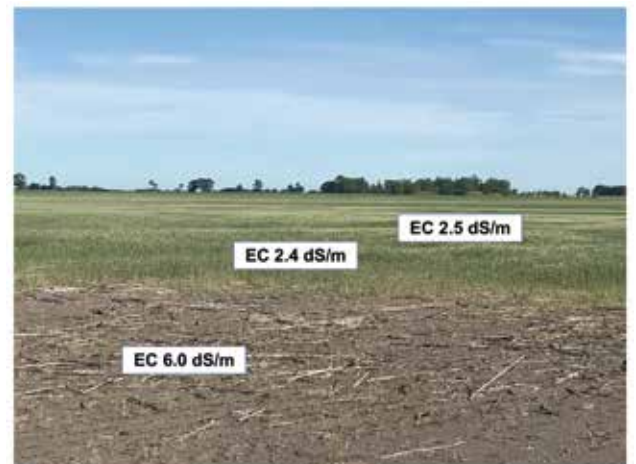
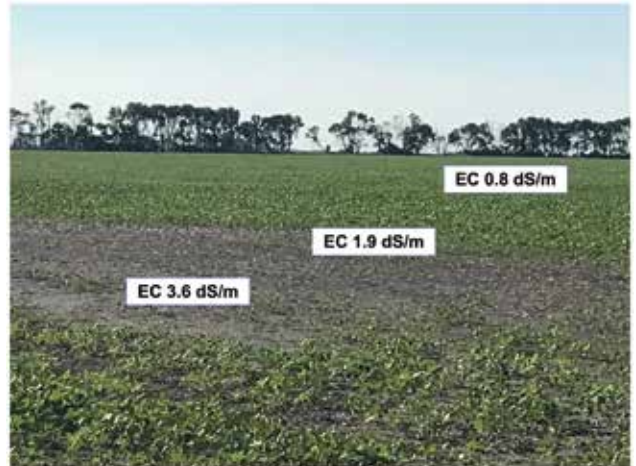
It is important to remember that salinity (soluble salts) will impair plant growth, even if you do not see the “nuclear apocalypse” scenario with white salt crusts where no plant, not even kochia, will grow. You need a soil test to measure the severity of the salinity problem.

When assessing the soil salinity problem, make sure that you take several soil samples because there will be a salinity gradient from the good to the bad and even the ugly. Start collecting soil samples in the heart of the worst salt flat and move toward the moderate to good crop growth areas. You should have at least three or four soil samples to measure the salinity gradient.

In June 2021, we mapped the salinity gradient in two fields, soybean and wheat, near Northwood, ND. The photographs reveal a wide range of crop growth in response to salinity. In the soybean field, the worst saline flat had an electrical conductivity (EC 1:1) of 3.6 dS/m, whereas the good soybeans were growing in soil with only EC 0.8 dS/m. The poor soybeans in the middle were at EC 1.9 dS/m. Soybean typically begins to struggle if EC is greater than 1 dS/m.

The wheat field had much worse salinity with EC 6.0 dS/m in the barren salt flats. In addition, the good wheat was still growing in EC 2.5 dS/m, which is considered quite high. This demonstrates that wheat has much better tolerance to salinity than a rather sensitive broadleaf species, like soybean.

In the photographs, there are no visual signs that the soybean field with EC 3.6 dS/m is any better than the wheat field with EC 6.0 dS/m. Both are struggling, but you need a soil test to know what to do next. Depending on the severity, there are short- and long-term strategies to manage or mitigate soil salinity. In the site with EC 6.0 dS/m, salt-tolerant perennials grasses are probably the only short- and long-term option to get anything growing and to prevent the problem from spreading further. In the field with EC 3.6 dS/m, a crop species with better salinity tolerance, like barley, is a better option than soybean. A crop rotation with more salt-tolerant crops will keep the field producing in the short term and help reduce the spread of salinity in the long term. No matter the solution, you need to measure the problem with a soil test before you can manage it.



Southern Trends Cont...

SCN egg counts from spring to fall. This is a simple and easy way to track SCN resistance and soybean variety efficacy in your own fields.

As we turn our attention toward fall and harvest, I hope we get some timely rains to finish the crop. A little August rainfall can really salvage a soybean crop. It is important every year, but especially this year, to soil test this fall and start planning for 2022. A soil test is the first step to determining the right fertilizer rate for the right place at the right time.

Soil Testing Behind the Combine

When are you planning to start soil sampling this fall? Right after small grain harvest? There are a number of reasons why we continue to encourage farmers and agronomists to start soil testing right behind the combine.

Soil sampling behind the combine is not a new concept. Decades ago, there was a “soil sampling date adjustment” for early soil nitrate-nitrogen tests. But, that adjustment was officially dropped by North Dakota State University in the same year of the Athens Olympics, the same year that Ronald Reagan died, and the last time the 17-year Brood X cicadas emerged. The year was 2004. The soil sampling date adjustment was dropped because research showed that residual soil nitrate-nitrogen following small grains changed little through the fall, so there was no reason to delay soil sampling.

There are more reasons to collect soil samples immediately after harvest. We expect high demand for fall soil testing following the 2021 drought, so take advantage of soil testing right behind the combine without delay.



JODI BOE
AGRONOMIST, CCA

- **More consistent soil cores:** Take soil samples before any fall tillage. The 0-6 inch soil profile is undisturbed and firm, which makes for much more consistent soil cores. This is important for non-mobile nutrients like phosphorus, potassium, and zinc. Fall tillage will leave a rough soil surface with large clods, which results in an inconsistent soil sample depth. This will cause soil test levels to jump around from year to year.

- **Turnaround time:** Collecting soil samples behind the combine ensures no delays later. This gives you more time to get soil test results back and more time to make a fertilizer plan with the grower. If fall precipitation creates wet soil conditions or early freeze-up occurs, you do not want to get caught with poor soil sampling conditions later (think about 2019).

- **Fall fertilization:** Getting soil test results in your hand sooner means you still have time for fall fertilization. Fall-applied phosphorus and potassium fertilizer is a common practice in many areas. Soil testing behind the combine can help you take advantage of lower fertilizer prices and the wider fall fertilizer application window.

You can find more comments on soil testing behind the combine from Dr. Dave Frazen, NDSU Extension Soil Specialist here: <https://www.agvise.com/soil-testing-right-behind-the-combine/>

Postcards and Poster Promote Soil Testing

Each year, AGVISE provides our customers with free postcard mailers to promote soil testing for the producers they serve. The postcards help direct their producers' attention to soil testing right after harvest begins, which gets the soil testing season started on time. Customers who use the postcards tell us the postcards help them start soil testing earlier and ultimately get more soil testing done.

We can customize your postcard message so you can tell producers exactly what you want! Here is an example of what one customer had us print on her postcards last year.

“Call our agronomy staff today to sign up for soil testing (555-123-4567). Soil testing is the first step towards a profitable crop in 2021!”

Once you receive your customized postcards, all you have to do is put the producer's name and address on the postcard, add a stamp, and put them in the mail. These postcards also fit into most statement envelopes, so you can include them with statements. If you want some personalized postcards to send to your producers at no charge, please call our Northwood office (701-587-6010) and ask for Mary. She will ask what you want printed on the postcard and how many postcards you want.

Don't forget, we also have a colorful poster that promotes soil testing with 4R Nutrient Stewardship. Of course, we all know that good nutrient stewardship begins with soil testing! After you have done the proper soil testing, you can follow the 4Rs: Right Rate, Right Source, Right Place, Right Time. If you want us to send you a new poster to promote soil testing, please contact our office.



AGVISE

LABORATORIES

804 Highway 15 West
P.O. Box 510
Northwood, North Dakota 58267
701-587-6010 / FAX: 701-587-6013
www.agvise.com

PRESIDENT'S CORNER

I am encouraged to see 2021 returning to something closer to normal as the COVID-19 pandemic diminishes. The disruptions of the past year have been beyond what any of us could have imagined. It has presented us all with personal and professional difficulties, but I have also observed and admired the resilience of our agricultural community. Then, the rain stopped and our resilience was tested again. There is no denying that 2021 has been one of the hottest and driest summers in a long time, and it will set some records.

As harvest approaches, both AGVISE Laboratories' locations are prepared for the fall soil testing season. We know that every soil sample in the fall is a "rush" because farmers will be eager to capture lower prices for fall-applied phosphorus and potassium fertilizer. The AGVISE team is ready and willing to answer any questions you might have as the season begins. I hope you have a safe and productive fall ahead.



CINDY EVENSON
PRESIDENT
AGRONOMIST, CCA

SOUTHERN TRENDS

Through the summer of 2021, most of the upper Midwest has experienced some degree of drought conditions, and some places are worse than others. In the southern trade region, we have seen potassium (K) deficiencies in crops where we had never seen them before. The very dry soil conditions had produced some drought-induced potassium deficiencies in corn and soybean, even though the soils were at or above the soil test K critical level (around 150 ppm). The lack of soil water had limited soil K availability in the plant root zone, and plant K uptake was reduced. Rainfall later in the growing season has fixed some of the potassium deficiency symptoms, but some locations are still showing symptoms. We will need to pay closer attention to potassium in future years.

Our soybean cyst nematode (SCN) resistance tracking project continues for the third year. Some SCN populations have become tolerant to the PI88788 SCN-resistance trait found in most soybean varieties, and now some producers are switching to soybean varieties with the Peking SCN-resistance trait. For the project, we collected the first round of SCN soil samples from farmer-cooperator fields around June 1, and the second round will be collected just before harvest. If the SCN population is resistant and successfully reproducing, we will see an increase in



RICHARD JENNY
AGRONOMIST, CCA

Continued on page 4