



# AGVISE

LABORATORIES

## Timely Information for Agriculture

### Spring 2026

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## NORTHERN NOTES

Spring is always the shortest season on the northern Great Plains. The calendar suggests that there are four seasons of equal length through the year, but we know all too well that spring is a short and ephemeral blink. From the time the last winter snow has melted to the first 90+° F summer day, it is seldom more than two to three weeks. In agriculture, we call this the spring planting season.

Weather is not the only thing that will change this spring. A tumultuous geopolitical situation in the Middle East has already affected energy markets and trade routes. As crop and fertilizer prices react accordingly, we can and should expect planting intentions to change too. To make the best decision, you will need up-to-date soil test information on all fields.

If nitrogen fertilizer prices jump, switching more acres to soybean or pulses is not a slam dunk. If you have fields with high soybean iron

deficiency chlorosis (IDC) risk, can you procure soybean seed with strong IDC resistance? Do you have planting equipment to apply Fe fertilizer with the seed? How about soybean cyst nematode (SCN)?

Nitrogen fertilizer price is just one part of the equation. I trust you will crunch the numbers and make a good decision for your operation, but you will need the right numbers to crunch. Following 2025, we saw higher residual soil nitrate-N after wheat and corn across much of the region, and it also brought more variability from field to field (see graph on page 3). If you do not have current soil test information, this spring still offers a good window and opportunity to collect soil samples. There is still time to make the right decision for whatever change spring will bring.



**JOHN BREKER**  
SOIL SCIENTIST,  
CCA, 4R NMS

## AGVISE Laboratories Celebrating 50th Anniversary in 2026

50 years—It is a monumental milestone. AGVISE proudly celebrates 50 years of business in 2026. AGVISE was founded in April 1976 by Dr. Edward Lloyd to create a new agricultural consulting and research firm in the small town of Northwood, ND. Prior to his entrepreneurial aspirations, Dr. Lloyd was a professor of plant pathology at North Dakota State University. In the 1970s, the enterprises of crop consulting and contract research farms were

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## 50th Anniversary Open House and Laboratory Tours

Come help us celebrate our 50th Anniversary! We are hosting an open house and laboratory tours at the Benson and Northwood laboratories. Refreshments will be served.

### Benson, MN

Tuesday, April 14  
10:00 am to 3:00 pm

### Northwood, ND

Tuesday, July 21  
10:00 am to 3:00 pm

## Agvise 50th Anniversary, Continued

new concepts to the agricultural industry. The first employees were Dr. Lloyd and John Nordgaard.

The laboratory division began in 1977 when Robert Deutsch was hired to join the team as a soil scientist. With an operational laboratory, AGVISE was now able to provide a wide selection of soil and plant analyses to farmers and agronomists. In 1979, the Northwood facility was moved to its current location along Highway 15. That same year, the Benson, MN facility was started when John Nordgaard expanded the service territory with laboratory, consulting, and research capabilities into southern Minnesota.

Through the years, AGVISE concentrated on developing and expanding the laboratory and contract research divisions. The crop consulting and third-party soil sampling services were discontinued in 1989, as these had become established services in their own right. In December 1996, disaster struck with a fire consuming the Northwood facility. At this time, many changes occurred. The company split into AGVISE Laboratories and AGVISE Research. The laboratory division became an employee-owned ESOP company, and a new laboratory was constructed to replace the lost facility. During the reconstruction period in Northwood, most of the laboratory analyses were handled at the Benson facility. The contract research division was retained by Dr. Lloyd and his family, who still own and operate the contract research farm today.

In August 2007, disaster struck again in Northwood. An EF-4 tornado hit the town of

Northwood and destroyed the laboratory. Within days, the Board of Directors elected to rebuild the laboratory. Soil samples were again processed at the Benson facility, just as the fall soil testing season had begun. As an employee-owned company, everyone pitched in and helped during this crazy time, making sure we succeeded once again.

The disasters are marked milestones through the past 50 years, but a lot of other important improvements and changes occurred during the “calm” years. Soil sample volumes increased as grid and zone soil sampling became standard. New analysis services were added in the laboratory. Robotic automation and data transfer technologies continued to improve, and much of these new technologies were designed and built by AGVISE employees. Beyond the laboratory, AGVISE has also been an innovator in electronic data transmission technologies to clients. The first “AGVISOR” program, launched in 1992, was an actual computer program installed on PCs to electronically deliver soil test data via dial-up internet, generate fertilizer guidelines, and create soil test reports. The AGVISOR platform was transitioned to a web browser-based application in 2010, and the most recent AGVISOR version was launched in 2025. There have been improvements and changes at all layers of this business.

We want to thank all of our customers for their continued support and trust in AGVISE over the past 50 years. We look forward to serving you for many years to come.

## USDA-NRCS CEMA 216: A Cost-sharing Program for Soil Health Testing

In January 2026, the USDA-NRCS released an update to their Conservation Evaluation and Monitoring Activity (CEMA) 216 – Soil Health Testing. The CEMA 216 program has special soil health testing requirements that AGVISE Laboratories is able and prepared to provide to our clients. The CEMA 216 program requires water-stable aggregate (WSA) classes, WSA sand correction, total organic carbon, permanganate-oxidizable carbon (POXC), 24-h CO<sub>2</sub> respiration, autoclave citrate-extractable (ACE) protein, soil pH, and soil texture. The soil sample collection also requires special instructions and submission forms, which you can find on the

AGVISE website at Resources >> Submission Forms. If you have any questions about soil sample collection and submission for CEMA 216, please contact AGVISE before you collect and ship the soil samples. If the soil samples are collected improperly, you will need to go back to the field and recollect them.

Contact your local USDA-NRCS office for more details on CEMA 216, program eligibility, and sign-ups. AGVISE Laboratories also meets the CEMA 216 requirement to choose a laboratory certified through the Performance Assessment Program (PAP) from the North American Proficiency Testing (NAPT) Program.

## Considering Corn on Corn?

In 2025, continuous corn-on-corn acres were an attractive option for farmers in the upper Midwest. Will we see more corn acres in 2026 too? For farmers considering continuous corn for the first time, it is not as simple as following soybean each year. You must pay extra attention to hybrid selection, fertilizer plans, and pest management. Excess crop residue must also be managed proactively.

**Field selection:** Select highly productive fields. Avoid fields with poor drainage (e.g., high clay without tile drainage) or low water holding capacity (e.g., sandy soils without irrigation). These soils are also prone to more soil nitrogen losses through denitrification or nitrate leaching. Saturated soils can take longer to warm in spring and reach soil temperatures  $>50$  °F, which may delay planting date. Sandy soils may not hold enough water to achieve high crop yields, especially if stored soil water in the subsoil has been low since last fall.

**Hybrid selection:** Continuous corn can experience 5-10% yield loss (aka yield drag) compared to corn following soybean. Choose the strong corn hybrids with proven yield potential and the ability to handle excess crop residue and traits for increased insect pressure (e.g., corn rootworm, corn borer).

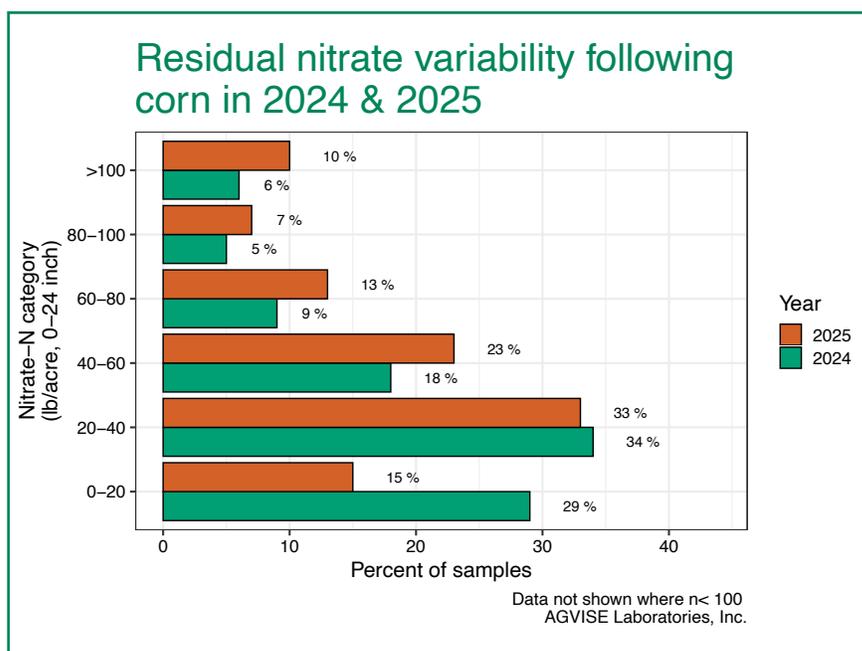
**Stand establishment:** Seed placement, emergence uniformity, and stand count are key to good corn grain yields. Do not try planting corn if the field is too wet or too cold, as these will only jeopardize the corn crop at its start. Rapid germination and emergence are necessary for a good corn stand. Wet soils also increase the risk for wheel track and sidewall compaction, which can restrict root growth, nutrient uptake, and final crop yield. For better seed placement, you may also need to slow the planter speed.

**Crop residue:** Corn has more than twice the crop residue than soybean. Planting corn into heavy crop residue will require good row cleaners to remove

excess residue from the seed row. Excess residue can create cooler and wetter soil conditions that may delay planting date and germination. A clean and uniform seed row will help improve planting depth consistency, seed-to-soil contact, and emergence uniformity. Poor crop residue management will hinder germination, emergence, and reduce crop yield.

**Soil fertility:** Starter fertilizer should not be skipped for corn-on-corn! The challenges around excess crop residue (cooler and wetter soils) and earlier planting dates underscore why starter fertilizer is important. For starter fertilizer placed with seed in furrow, the N+K<sub>2</sub>O rate should not exceed 10 lb/acre for 30-inch rows. For 2x2 placement, the extra distance between seed and fertilizer provides greater safety and allows much higher fertilizer rates.

The nitrogen rate for corn-on-corn is usually 30-40 lb/acre N more than corn following soybean. The extra nitrogen is required to overcome nitrogen immobilization from the higher C:N ratio of corn residue, compared to the lower C:N ratio of soybean residue. A current soil nitrate-N test should be collected to adjust N fertilizer rates in spring. In Fall 2025, there was more residual nitrate-N after corn than usual across the whole region, and there was a lot of variability from field to field (see variability graph). There is no room for guessing how much nitrate-N could have been leftover, so each field should be soil sampled for nitrate-N.



## Fluffy Soil Syndrome: When Too Much Tillage Brings Growing Season Woes



**DR. JED GROW**  
AGRONOMIST,  
CCA, 4R NMS

It may have a cute name, but it can be ugly. Fluffy soil syndrome is a real problem where soils have been worked with tillage too much and weird symptoms start appearing, particularly following dry winters and springs. This phenomenon was featured in the *Journal of Soil and Water Conservation* (72:10A-14A) in an article by

Dr. Aaron Daigh (NDSU) and Jodi DeJong-Hughes (Univ. Minnesota). The fluffy soil conditions occur when the soil profile is tilled excessively, and there has not been sufficient rain yet to help settle and consolidate the soil profile. In effect, the soil profile remains “fluffy” with no real soil structure, a lot of air space, and poor soil particle-to-particle contact. This creates conditions for poor crop emergence, poor root development, and poor nutrient uptake.

You will begin to see unique patterns of poor crop emergence or nutrient deficiencies appearing in a regular pattern across the field, and the weird part is the greener plants align with wheel tracks from planting or spraying activities (see photograph). Aerial imagery can be helpful to see the problem and patterns. The plants away from the wheel tracks will show the actual symptoms, which could look like drought or potassium deficiency, or maybe nitrogen or sulfur. This is the opposite of what we expect in wet years, where the wheel tracks may become compacted and nutrient deficiencies appear in the wheel tracks.

Fluffy soil syndrome is difficult to diagnose because paired soil and plant samples from the good “wheel track” areas and the bad “nutrient deficient” areas will likely show adequate soil fertility in both spots. This indicates that the symptoms are not caused by lack of nutrients in soil, but by soil conditions that are limiting nutrient uptake. For nutrients like potassium that move to plant roots through diffusion, the fluffy soil conditions greatly impair soil-water-root connectivity that hinders potassium diffusion to the plant root. This is why the wheel track that has firmed and consolidated the soil

profile provides better soil-water-root connectivity and does not show the potassium deficiency symptom.

Once you see it, there are no immediate fixes for fluffy soil syndrome. You are stuck waiting for rain to help settle the fluffy soil profile. Spreading more fertilizer across the soil surface will not help because you still need rain to get the fertilizer into the soil. For long-term soil management, the first step is limiting excessive fall tillage. Do not work fields more than needed, and recreational tillage is still a real problem for some. Reducing tillage depth and intensity can also help preserve some soil aggregates and soil structure. Strip till is a nice compromise because you can manage crop residue in the strip and prepare the seedbed for next year, while maintaining soil structure and soil water between the strips.



**Tilled fields in western Minnesota with visual symptoms of fluffy soil syndrome (poor soil particle-to-particle contact) on crop performance. Area photographs were taken in July 2015, showing good plant growth in compacted tire tracks and poor plant growth between tire tracks. Photographs from Jodi DeJong-Hughes, used with permission.**

## Mining the Phosphorus Archives

The high price of phosphorus fertilizer has everyone thinking hard about phosphorus rates, sources, and placement options. You are not the only person wondering how to stretch each fertilizer dollar farther, without jeopardizing crop yield and profitability. Phosphorus has been a frequent topic covered in the AGVISE newsletters over the years. We have assembled a list of phosphorus article highlights from the AGVISE newsletter archives. These articles cover some of the most frequently asked questions that the AGVISE staff receives from farmers and agronomists. You can find these articles on the AGVISE website at Resources >> Newsletters, or click on the article links if reading the electronic version of the newsletter.

- **Choosing the Right Phosphorus Guideline Rate: Broadcast, Band, or University? (Winter 2025-2026)**
- **Building Soil Test Phosphorus (Spring 2024)**
- **Soil Test Phosphorus Methods: Bray-1, Olsen, or Mehlich-3? (Spring 2023)**
- **Starter Phosphorus for Corn (Spring 2025)**
- **Starter Phosphorus for Small Grains (Spring 2021)**
- **Starter Fertilizer Display and Minimum Rates (Spring 2025)**
- **Phosphorus Source: Ortho-P vs. Poly-P (Spring 2024)**

## SOUTHERN TRENDS



**DR. BRENT JAENISCH**  
AGRONOMIST, CCA

High fertilizer prices and low crop prices are giving growers an uneasy feeling heading into the 2026 growing season. The USDA planting intentions in February indicated that corn acres will be down and soybean acres will be up in 2026. I find these estimates hard to believe as my conversations over the winter months suggest that corn acres will remain steady in the upper Midwest. In fact, there is more interest in corn-on-corn in North Dakota and even Manitoba.

When fertilizer prices are high, the first reaction is often to cut fertilizer rates to save money. However, reducing fertilizer rates indiscriminately (or cutting the wrong nutrient) could have a huge effect on final grain yields and profitability. Soil testing remains the best tool to predict if a crop yield response is expected from additional fertilizer based on soil test levels. It can also tell you what nutrients may be okay to cut and which acres you can reduce fertilizer rates on, especially if you have current grid or zone soil test data. Before spring planting gets underway, we have a great opportunity to collect soil samples and get current soil test information for the most accurate fertilizer decisions. AGVISE is ready for spring and prepared to analyze your soil samples.



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## PRESIDENT'S CORNER



**CINDY EVENSON**  
PRESIDENT  
AGRONOMIST, CCA

The arrival of warm weather means that farmers and agricultural professionals are gearing up for the planting season. AGVISE Laboratories plays a crucial role in ensuring everyone has the most up-to-date soil test information needed to make the most of fertilizer inputs this year.

As AGVISE Laboratories celebrates our 50th Anniversary in 2026, we look back at where our company has been, and we also look forward to new ways to continue improving our services and support to our clients. Through the years, AGVISE has explored and developed new and different analytical methods. Some methods continue through today, while others have been replaced along the way. Through all these changes, we continue to excel at the fundamentals of soil fertility and plant nutrition, soil and water characterization, and strong agronomic support.

AGVISE Laboratories is proud to support the agricultural community and your businesses for the past 50 years and many more years to come. Our dedicated team of Certified Crop Advisers is ready to help you ensure that the 2026 growing season gets off to the best start possible. I hope you all have a safe and timely planting season and a great growing season ahead.