



Timely Information for Agriculture

Winter 2025-2026

INSIDE:

Soil Nitrogen Trends	2
Phosphorus Rate Guidelines	2
Ortho-P vs. Poly-P.....	5
Southern Trends	5
President's Corner	6

NORTHERN NOTES

Up north, wet fall weather slowed harvest and soil sampling in many parts of the region. Some folks will not be able to finish corn harvest until the soil freezes and can hold the weight of combines and grain carts. In spite of the difficult harvest, soil sampling has been progressing at a fast pace. With high fertilizer prices and low crop prices, there is a high demand for soil testing. Each fertilizer dollar will be extra important next year, and you will need the most up-to-date soil test information to make the right fertilizer decisions.

The late harvest may force some people to take soil samples in the winter or next spring. AGVISE sells in-cab hydraulic soil sampling systems and special heavy-duty (HD) chromoly steel soil probes

designed for winter soil sampling in frozen conditions. With the right equipment, many customers can continue soil sampling in winter through 3-4 inches of frost. Please give us a phone call if you have any questions on winter soil sampling tips and tricks.

The high price of phosphorus fertilizer has prompted a lot of questions about soil P management strategies and “new” phosphorus products. With all of these questions, we are featuring an extra heavy dose of phosphorus-related topics in this newsletter. We hope these articles will help answer those questions for 2026.



JOHN BREKER
SOIL SCIENTIST,
CCA, 4R NMS

AGVISE Soil Fertility Seminar Dates are Set

The AGVISE Soil Fertility Seminar dates are set for 2026. These seminars cover soil fertility and plant nutrition topics along with other issues that currently challenge our region. You will not want to miss the great program lineup, so mark your calendar now! A registration letter for the USA seminars was sent to AGVISE customers in early November so they had the first chance to register for the seminars. Please make sure that you register early if you plan on attending because space is limited and there is usually a waiting list.

If you did not receive the mailing, please call our Northwood office (701-587-6010) to make sure we have your current contact information on file. If you received this newsletter, you are on our physical mailing list, but we may not have your current email address for email updates.

Date	Location	CCA CEUs Applied For
January 6	Willmar, MN	3.0 NM, 2.5 SW
January 7	Watertown, SD	3.0 NM, 2.5 SW
January 8	Grand Forks, ND	3.0 NM, 2.5 SW
March 3	Portage la Prairie, MB	TBD
March 5	Saskatoon, SK	TBD

Residual Soil Nitrate-N after Wheat and Corn – Fall 2025

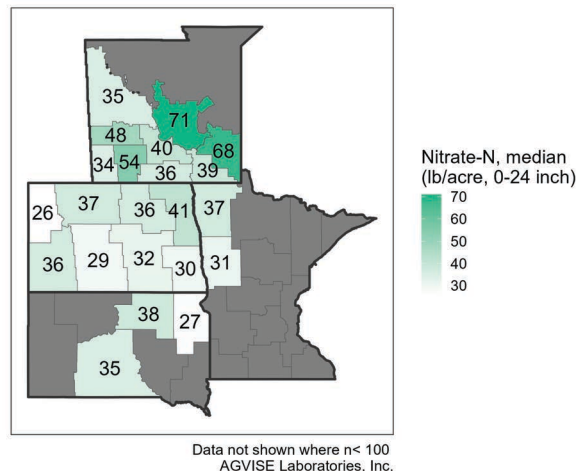
Across the region, precipitation patterns during the growing season were all over the place– from monsoon to drought. In Manitoba and the drier parts of North Dakota and South Dakota, more residual nitrate-N remained after wheat, as we can expect following periods of drought with reduced crop yield and little to no soil nitrogen losses. For wetter parts of the map, the amount of residual nitrate-N after wheat and corn crops was still higher than expected, especially following good crop yields (and good protein for wheat). In these regions, the late season rainfall timing and warmer temperatures likely helped achieve good crop yield and also spurred on extra nitrogen mineralization from soil organic matter.

At this time of year, we usually have more corn fields harvested and soil sampled, but delayed corn harvest has limited the number of corn fields that have been soil sampled at the time this article was written. For the first 8,000 soil samples following corn in the region, the early trend in residual nitrate-N after corn is showing more residual nitrate-N in many zip code areas than the long-term average of 30-35 lb/acre nitrate-N (0-24 inch soil profile). In fact, most zip code areas have 20 to 50% of soil samples with over 60 lb/acre nitrate-N after corn (summary table not shown). There is a lot more nitrogen leftover that growers will want to consider for their crop rotation next year.

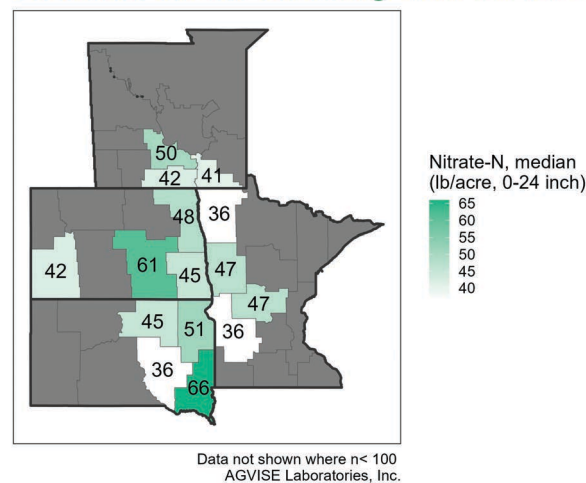
The economics of continuous corn are currently more attractive than previous years, and growers thinking about continuous corn in 2026 will want to take advantage of residual nitrate-N leftover in the soil profile for nitrogen fertilizer plans next year. This means we should expect more soil sampling after corn than previous years, either later this fall or next spring.

The big picture data helps us visualize general trends and patterns across the region, but it is very important to soil sample each field to determine the amount of soil nitrate-N remaining in the 0-24 inch soil profile. High fertilizer prices are just one more reason to get current soil test information. Soil testing is not a perfect tool, but it is the best tool available to help you determine the right fertilizer rate needed for next year's crop.

Residual nitrate following wheat in 2025



Residual nitrate following corn in 2025



AGVISE Fertilizer Guideline Options in Tight Economic Times

In the current economic climate of high production costs for land, seed, fertilizer, chemical, fuel, and equipment, it is important to examine where growers can decrease input costs without jeopardizing crop yield in the short term. For reducing fertilizer costs, the importance of soil testing and banding phosphorus fertilizer has been written about extensively by soil fertility specialists and ag economists alike. Both over- and under-fertilization reduce grower profits. While building soil test P may not be the best idea for next year,

you also need to make sure that you are applying enough P fertilizer to achieve high yields.

AGVISE Laboratories provides four different P and K fertilizer guidelines for our customers to choose (see charts and tables). Below is a short description of these guideline types and how each guideline will affect soil test P over time. This information will hopefully help you choose which fertilizer guideline is best suited to your equipment and management.

Broadcast P & K Fertilizer Guideline: The AGVISE broadcast fertilizer guideline is based on uniform fertilizer application and incorporation with tillage, except for alfalfa and other perennial crops. Seed safety concern is minimal for broadcast fertilizer application.

At very low to medium soil test levels, the broadcast guideline will build soil test levels to the high range over several years (5 to 8 years). If soil test levels are very high, the broadcast guideline is reduced to the suggested starter P and K fertilizer rate.

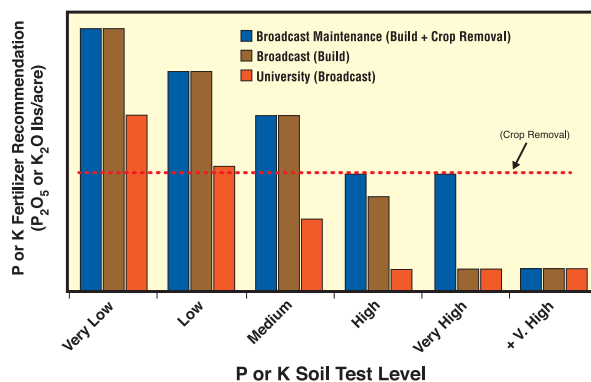
Broadcast with Maintenance P & K Fertilizer Guideline: The AGVISE broadcast with maintenance fertilizer guideline is the same as the broadcast fertilizer guideline except that when soil test levels are high or greater, the broadcast with maintenance guideline is equal to crop P and K removal based on selected yield goal. The soil test level will not drop because you will always be applying a fertilizer rate equal to crop removal to maintain the soil test level.

Band P & K Fertilizer Guideline: The AGVISE band fertilizer guideline assumes that P and K fertilizer is placed at least 2 inches away from seed. If too much fertilizer is placed directly with seed, delayed emergence and plant stand loss may occur. The seed-safe fertilizer rate placed with seed is determined by soil water content, soil texture, row width, seed opener spread, fertilizer material, and crop sensitivity. Utilize local information from crop consultants and equipment manufacturers to determine the seed-safe fertilizer rate.

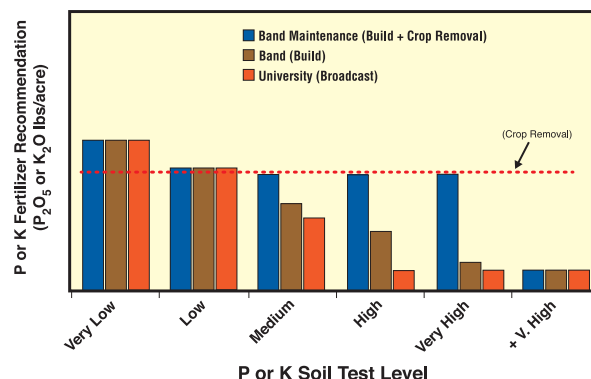
At very low soil test levels, the band guideline will slowly build soil test levels to the medium range over several years. If soil test levels are high, the band guideline is reduced to the suggested starter P and K fertilizer rate. If soil test levels are initially high, the band guideline will lower soil test levels to the medium range over many years (8 to 10 years).

Band with Maintenance P & K Fertilizer Guideline: The AGVISE band with maintenance fertilizer guideline is the same as the band fertilizer guideline except that when soil test levels are medium or greater, the band with maintenance guideline is equal to crop P and K removal based on selected yield goal. The soil test level will not drop because you will always be applying a fertilizer rate equal to crop removal to maintain the soil test level.

Comparison of Broadcast Guidelines



Comparison of Band Guidelines



University Broadcast Fertilizer Guideline: The university broadcast fertilizer guideline has been compiled as one equation set from the University of Manitoba, the University of Minnesota, Montana State University, North Dakota State University, and South Dakota State University. The university guideline is designed to provide the required crop nutrients to optimize crop yield for that one year. This is known as the “sufficiency” approach.

At very low soil test levels, the university broadcast guideline will slowly build soil test levels to the medium range over several years (8 to 10 years). If soil test levels are high, the university broadcast guideline will be less than crop removal or reduced to zero. This will cause soil test levels to decline to the medium range over time. When the university broadcast guideline is zero, university soil fertility specialists still recommend starter fertilizer for most crops, such as 10-15 lb/acre P₂O₅ for small grains or corn.

University soil fertility specialists also suggest that the university broadcast rate can be reduced to half if you can apply P fertilizer in a band with or near the seed (assuming seed safe placement and rates). A starter rate of 10-15 lb/acre P₂O₅ for small grains or corn is still suggested.

Phosphorus Strategies for Corn

In periods of high P fertilizer prices, corn growers can capitalize on lower banded P fertilizer rates and not sacrifice grain yield if soil test P is medium or higher. University research has shown that broadcast rates can be cut in half if P fertilizer is banded with or near the seed without losing crop yield. The band must be no more than 2 inches away from the seed to achieve the starter effect. For fertilizer placed with seed, the maximum N + K₂O should not exceed 10-15 lb/acre. Generally, 10-34-0 rates of 7-8 gal/acre placed with seed should not cause

emergence or stand problems, unless soil conditions are dry or the soil is coarse-textured or sandy.

If a shortage of 10-34-0 develops this spring, you should prioritize which fields get higher rates of 10-34-0. The first priority is any corn field following non-mycorrhizal crops like canola or sugar beet, which can present fallow syndrome problems for corn or small grains. University research has also shown that liquid or dry fertilizer products perform the same, as long as the applied nutrient rate is the same. The choice for liquid or dry products is based on the grower's planting equipment.

**Comparison of Phosphorus Fertilizer Guideline Rates
Corn – Expected Yield 175 bu/acre**

	Soil Test Level					
	VL	L	M	H	VH	VH+
Bray-1 P ppm	0-5	6-10	11-15	16-20	21-25	26+
Olsen P ppm	0-3	4-7	8-11	12-15	16-19	20+
Guideline Option	Fertilizer P Rate (lb P₂O₅/acre)					
University Broadcast	105	75	45	15*	15*	15*
AGVISE Band	90	70	55	35	20	15*
AGVISE Band/Maint.	90	70	65	65	65	65
AGVISE Broadcast	155	130	105	80	55	15*
AGVISE Broadcast/Maint.	155	130	105	80	65	65

* = To be applied as starter, with or near the seed.

Phosphorus Strategies for Small Grains

NDSU research has shown that during periods of high P fertilizer prices (\$1.00/lb P₂O₅), it is not economical to build soil test P, even if wheat prices were \$8/bushel. If P fertilizer prices dropped to \$0.50/lb P₂O₅, then it would be profitable to build soil test P to 10 ppm Olsen P (medium range). For small grains, fertilizer P is most often placed with or near the seed at planting; this maximizes the placement efficiency and also provides the starter effect and promotes strong tiller initiation. Similar to corn,

P fertilizer rates can be cut in half if placed with or near the seed without losing crop yield. The maximum N + K₂O should not exceed 25-30 lb/acre when placed with the seed (assuming row spacing 6 or 7 inches).

**Comparison of Phosphorus Fertilizer Guideline Rates
Wheat – Expected Yield 60 bu/acre**

	Soil Test Level					
	VL	L	M	H	VH	VH+
Bray-1 P ppm	0-5	6-10	11-15	16-20	21-25	26+
Olsen P ppm	0-3	4-7	8-11	12-15	16-19	20+
Guideline Option	Fertilizer P Rate (lb P₂O₅/acre)					
University Broadcast	55	40	25	15*	15*	15*
AGVISE Band	50	40	30	25	15*	15*
AGVISE Band/Maint.	50	40	35	35	35	35
AGVISE Broadcast	95	80	60	45	30	15*
AGVISE Broadcast/Maint.	95	80	60	45	35	35

* = To be applied as starter, with or near the seed.

Phosphorus Forms: Ortho- or Poly-P? Does it matter?



DR. JED GROW
AGRONOMIST,
CCA, 4R NMS

The high price of phosphorus fertilizer has sparked questions about different phosphorus fertilizer forms. The debate over orthophosphate and polyphosphate has raged for decades. Just when we think we have put the issue to bed, it comes up again! The truth is either form of phosphate fertilizer will provide the same

crop yield response. With “new” fertilizer products and additives on the market, it is time to revisit the basics of phosphorus fertilizer materials.

All dry phosphate fertilizers, like monoammonium phosphate (MAP 11-52-0), diammonium phosphate (DAP 18-46-0), and triple superphosphate (TSP 0-46-0), are orthophosphate materials. These dry phosphate fertilizers are easy to classify—all orthophosphate. Most liquid phosphate fertilizers contain either orthophosphate and/or polyphosphate of varying proportions. Either way, all phosphorus fertilizer materials, dry or liquid, will act the same once applied to soil and participate in the same plant uptake processes or P fixation reactions once dissolved in the soil solution.

In fertilizer manufacturing, all products start as phosphoric acid derived from rock phosphate, but if

you want to make a high content liquid phosphorus fertilizer, that means you need to remove some water from phosphoric acid in the process. This produces short chains of orthophosphate, which then start linking together to form longer polyphosphate chains (poly means multiple). As more water is removed, the fertilizer material creates more polyphosphate (longer chains), resulting in a denser material, with some smaller amount of orthophosphate remaining. In most polyphosphate blends, like 10-34-0, the composition is around 70% polyphosphate and 30% orthophosphate. This results in a high content liquid phosphorus fertilizer with more phosphorus per gallon, meaning that you have to haul less material to the field to achieve the same phosphorus rate.

When polyphosphate is applied to soil, the fertilizer reacts quickly with soil water and breaks into orthophosphate (short chains) again. Even in cool soil temperatures (40 deg F), over 40% of polyphosphate converts to orthophosphate within 72 hours. Within one to two weeks, the conversion is largely complete, leaving plant-available orthophosphate for crop uptake.

In the end, it all comes back to crop yield, right? In countless studies across the Midwest and Great Plains, the performance of orthophosphate and polyphosphate have been equal, as long as you apply the same phosphorus rate.

SOUTHERN TRENDS



DR. BRENT JAENISCH
AGRONOMIST, CCA

Who could have thought that the 2025 growing season would mirror the 2024 growing season? I surely did not. That was a soil sampling season for the record books. After an excessively wet spring and summer, the fall turned dry and stayed dry in the Benson territory.

With very few rain delays, harvest and soil sampling season started and continued with very few breaks. I am always amazed at how much work can get done in a short amount of time with some cooperation from Mother Nature.

The 2025 growing season presented some real

challenges for nitrogen management. The spring and summer rains broke precipitation records in some areas, and many fields were left with numerous acres of yellow corn and waterlogged parts in fields. Growers were faced with the decision to sidedress corn with nitrogen and at what rate. Some fields were not fit for sidedress applications until mid-July, which was well past the optimal window. These late sidedress applications turned into rescue applications. With all of these struggles, the final corn yields were average to below average for many growers near Benson, MN. However, 60 miles south of Benson, it was a record corn crop for some growers who had optimal growing conditions.

I wish to thank you all for a very productive fall soil sampling season. We got a lot done! I hope you have a great winter and hope to see you at a trade show or conference.



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



CINDY EVENSON
PRESIDENT
AGRONOMIST, CCA

Wow, what a fall!
Fall is always the busiest time of year at AGVISE, and this fall did not disappoint. The weather did not always cooperate, but people were able to make great progress in the field when we did get some nice days in a row. Now that AGVISE is back to running on our

normal turnaround times, I want to extend a special thank you to all our customers for trusting AGVISE Laboratories with your agricultural testing needs. It is our privilege to serve you and provide you with a high standard of quality and service.

As 2025 winds down, AGVISE is starting to get ready for a very special year. In 2026, we will celebrate the 50th anniversary of AGVISE Laboratories. The company was founded in 1976 when Dr. Ed Loyd started an agricultural research and crop consulting firm in Northwood, ND. The following year, the laboratory division began when Robert Deutsch was hired. As we celebrate the 50th anniversary in 2026, we will be sharing more information on the history and growth of AGVISE Laboratories. Stay tuned for special celebrations and festivities that will be announced later!

This winter, I hope to see many of you again at winter trade shows and agronomy update meetings. We wish you and your company a very successful end to 2025, a Merry Christmas, and a Happy New Year.