Minnesota Ag Retail Survey Report
Crop Year 2024

Out of the 300+ agricultural retail locations in Minnesota, we completed surveys at 52 randomly selected sites across nine Crop Reporting Districts (CRDs). We gathered data from 609 farm fields, ensuring oversampling of Iowa State University (ISU) Center for Survey Statistics and Methodology's (CSSM) target of 500 surveys for statistical significance. Iowa Nutrient Research & Education Council (INREC) aggregated the data to ensure confidentiality, and ISU CSSM extrapolated the data for statewide adoption.

Statewide Row Crop Acres	2024 (NASS CDL)
Corn	8,265,723 acres
Soybean	7,465,130 acres
Wheat	1,189,039 acres
Sugar Beet	384,319 acres
Row Crop Total	**17,304,211 acres**

Crop Rotation	Percentage	Acres
Corn-Soy	79.3%	13,717,986 acres
Continuous Corn	4.4%	767,290 acres
Sugar Beets/Soy/Corn	0.9%	160,813 acres
Sugar Beets/Soy/Corn/Small Grain	1.0%	167,527 acres
Extended Rotation	0.8%	132,679 acres
Other	13.6%	2,357,916 acres

Cover Crops

In this section, you will see data on how many acres are planted with cover crops and the percentage of total acres that represents. Tracking cover crop adoption provides critical insight into how Minnesota farmers are managing soil health and nutrient retention outside the primary growing season. Cover crops play a key role in reducing soil erosion, improving water infiltration, and capturing residual nitrogen that might otherwise be lost to waterways.

Cover Crop (Statewide Total)	Percentage	Acres
Cover Crop Planted (Fall of 2023)	7.0%	1,217,537 acres
Cover Crop by Type	**Percentage**	**Acres**
Cereal Rye	37.6%	458,287 acres
Oats	17.3%	210,459 acres
Species Mix	36.2%	440,708 acres
Other	8.9%	108,083 acres

Tillage

Here you will see a breakdown of fall and spring tillage practices prior to corn and soybeans across the state. Tillage practices in Minnesota generally fall into three categories that differ in soil disturbance and residue cover. Conventional (full) tillage involves intensive soil disturbance with little remaining residue, which can increase erosion risk. Conservation tillage reduces disturbance and aims to maintain at least 30% residue cover, helping protect soil and retain moisture while supporting crop establishment. No-till minimizes disturbance by planting directly into crop residue, offering the greatest benefits for erosion control and long-term soil health.

Tillage	Percentage	Acres
Fall Tillage Practices Prior to Corn		
Conservation	14.2%	1,169,822 acres
No-Till	7.7%	637,729 acres
Conventional (Full)	78.1%	6,458,172 acres
Spring Tillage Practices Prior to Corn		
Conservation	13.2%	1,089,153 acres
No-Till	5.6%	462,566 acres
Conventional (Full)	81.2%	6,714,004 acres
Fall Tillage Practices Prior to Soy		
Conservation	5.5%	413,196 acres
No-Till	8.9%	663,378 acres
Conventional (Full)	85.6%	6,388,556 acres
Spring Tillage Practices Prior to Soy		
Conservation	9.0%	671,339 acres
No-Till	8.2%	614,693 acres
Conventional (Full)	82.8%	6,179,098 acres

Nitrogen Application Practices

Here we are looking at nitrogen management practices, such as timing, placement, and use of inhibitors, which are central to both crop productivity and environmental protection. Collecting this data allows Minnesota to better understand how field-level decisions align with the principles of 4R Nutrient Stewardship (right source, rate, time, and place). These insights are crucial for identifying opportunities to reduce nitrogen losses to groundwater and surface water while maintaining agronomic efficiency.

Nitrogen Application Practices	Percentage	Acres
Commercial N VRT Applied	10.7%	880,880 acres
Fall Anhydrous Applied	13.9%	1,152,763 acres
Nitrification Inhibitor with Fall Anhydrous	78.1%	900,882 acres
Nitrification Inhibitor with Spring Pre-Plant or Sidedress	25.4%	1,566,104 acres
Apply N Spring Pre-Plant Only	49.4%	4,080,735 acres
Apply N Fall Only	25.3%	2,089,591 acres
Apply N Spring Pre-Plant & In-Season	15.1%	1,244,619 acres
Apply N Fall & Spring Pre-Plant	2.8%	228,762 acres
Apply N In-Season Only	2.7%	223,569 acres
Apply N Fall, Spring Pre-Plant & In-Season	2.4%	198,066 acres
Apply N Fall & In-Season	2.4%	200,382 acres

Nitrogen Rates

When we look at commercial only nitrogen rates, we're talking about fertilizer that comes strictly from commercial sources, no manure inputs. Documenting nitrogen application rates provides a foundation for evaluating whether fertilizer use aligns with agronomic recommendations and economic optimums. In Minnesota, where nitrogen loss is a major water quality concern, understanding rate variability across regions and cropping systems is especially important.

Nitrogen Rates	Pounds/Acre
Average Commercial N Rate on Corn-Soy (lb/ac)	173.0
Average Commercial N Rate on Continuous Corn (lb/ac)	187.8
Average Commercial N Rate on Sugar Beets / Soy / Corn (lb/ac)	164.5
Average Commercial N Rate on Sugar Beets / Soy / Corn / Small Grain (lb/ac)	150.9

Phosphorus Application Practices

This section details data related to phosphorus management. By tracking application rates, application methods, and soil testing, this survey helps determine how phosphorus use aligns with crop needs and soil test recommendations. State level insights into phosphorus application patterns are essential for evaluating progress toward reducing nutrient runoff and protecting Minnesota's abundant water resources.

Phosphorus Application Practices	Percentage	Acres
Soil Sampling for P	74.5%	12,889,475 acres
Variable Rate Technology (VRT) Applied	27.9%	4,834,593 acres
P Applied Rate Needed to Bring Up / Keep at Optimum Level	49.1%	6,580,141 acres
P Applied at Crop Removal Rate	39.1%	5,245,014 acres
P Applied Above Optimum Soil Test Level	2.4%	326,945 acres
Other Rate of P	9.4%	1,258,811 acres
P Surface Applied	81.7%	10,953,215 acres
P Incorporated with Planter	9.5%	1,273,614 acres
P Incorporated with Knifed Bands	1.5%	200,659 acres
Liquid P Injected	0.4%	55,593 acres
Other P Incorporation	6.9%	927,829 acres

P Soil Test Levels

Soil test phosphorus levels in Minnesota are commonly measured using three methods that differ based on soil conditions. The **Bray-P1 test** extracts P with acids and is suitable for most soils that are slightly alkaline to highly acidic, pH of 7.4 or less. The **Olsen test** extracts P using sodium bicarbonate and is the best test when soil pH is 7.4 or greater. The **Mehlich-3 test** is a single extractant which can be used to extract P, potassium (K), and micronutrients. Currently, there are no guidelines for the use of this soil test in Minnesota.

P Soil Test Levels	
Average Bray-P1	29.9 ppm
Average Olsen	11.3 ppm
Average Mehlich-3	22.1 ppm

Manure Use

These numbers reflect how manure is being used. Collecting data on manure use, including where and how it is applied, helps quantify its role in Minnesota's overall nutrient balance. Manure is a valuable nutrient source that contributes to soil health but requires careful management to prevent nutrient loss. Understanding manure management practices supports better integration of organic and commercial fertilizers and informs strategies to reduce nutrient runoff.

Manure Use	Percentage	Acres
No Manure	88.0%	7,274,659 acres
Beef	4.3%	351,623 acres
Liquid Swine	2.1%	170,060 acres
Dairy	2.1%	174,403 acres
Turkey	0.7%	57,967 acres
Other	0.5%	44,220 acres
Manure Generally Applied in the Fall	90.1%	719,446 acres
Manure Generally Applied in the Winter	0.0%	0 acres
Manure Generally Applied in the Spring	9.9%	78,827 acres
Manure Generally Applied In-Season	0.0%	0 acres
Manure Applied with Low Disturbance	56.2%	448,969 acres
Manure Application Included in N & P Recommendations	84.6%	675,262 acres