# Adam Birr

Minnesota Corn, comprised of both the Minnesota Corn Growers Association (MCGA) and the Minnesota Corn Research & Promotion Council (MCR&PC), appreciates the opportunity to submit the attached comments on the Draft 2025 Minnesota Nutrient Reduction Strategy (NRS).

September 10, 2025

Ms. Corrie M. Layfield
Nutrient Reduction Strategy Coordinator
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

**SUBJECT: Nutrient Reduction Strategy comments from Minnesota Corn**

Dear Ms. Layfield,

Minnesota Corn, comprised of both the Minnesota Corn Growers Association (MCGA) and the Minnesota Corn Research & Promotion Council (MCR&PC), appreciates the opportunity to comment on the Draft 2025 Minnesota Nutrient Reduction Strategy (NRS).

Minnesota Corn represents the 24,000 Minnesota corn farmers who contribute to the Minnesota corn checkoff program for research and education activities and the nearly 7,000 members of MCGA. Together the two organizations have the shared mission to identify and promote opportunities for corn growers. Minnesota Corn supports third-party science-based research focused on enhancing water quality and soil health, explores innovative uses for corn, and seeks to maximize the value of every bushel of corn grown in Minnesota. Minnesota corn farmers strive to implement practices that enhance stewardship of the state's natural resources to sustain a robust rural economy and build an environmentally and economically sustainable future for generations.

Minnesota Corn has invested in research, education, and conservation practices to reduce nutrient losses. We recognize the importance of the NRS in tracking progress and guiding efforts to meet 2040 nutrient reduction goals, and we respectfully submit the following comments for consideration.

**Key Concerns and Recommended Actions**

**Direct Financial Support and Funding Transparency**
Expanded workforce capacity and streamlined systems are helpful but cannot replace direct investment in farmers. Sustained cost-share and incentive programs—such as the Soil Health Financial Assistance Grants and AgBMP Loan Program—are essential to drive large-scale adoption. Reporting should clearly distinguish dollars spent on practices versus program administration to ensure resources directly advance NRS goals.
**Action:** Prioritize farm-level cost-share or other forms of financial assistance to farmers and require transparent accounting of practice vs. administrative spending.

**Elevate Proven Farmer-Focused Programs**

Minnesota has multiple programs with proven adoption, measurable impact, and unmet farmer demand that are ready to scale. The Soil Health Financial Assistance Grants, University of Minnesota (UMN) Nitrogen Smart Program, and AgBMP Loan Program should be prominently featured throughout the report, alongside the Minnesota Agricultural Water Quality Certification Program (MAWQCP) and Office of Soil Health programs. Elevating these programs signals confidence in farmer-led solutions and builds momentum where success is already demonstrated. Program descriptions should focus on Minnesota-specific initiatives, with out-of-state examples moved to an "illustrative" section.

**Action:** Highlight support and expansion of proven, existing farmer-focused programs in MN as cornerstones of the NRS update.

**Address Research and Data Gaps**

Future research should quantify nutrient reductions from stacked practices on the same acres to better reflect real-world conditions. Minnesota-specific studies must be prioritized, as most efficiency data in the current review come from out of state. Additional research is also needed on in-field nutrient management—specifically the role of biologicals and fine-tuning crediting of mineralization rates—as well as groundwater dynamics, including nitrate lag times and legacy effects. These efforts will help clarify when improvements can be expected and strengthen the connection between practice adoption and measurable outcomes.

**Action:** Fund Minnesota-specific research on stacked practices, in-field nutrient management, and groundwater dynamics to close critical knowledge gaps.

**Adoption Feasibility and Capacity**

In-field nutrient management should be recognized as essential, with practices like timing, split applications, variable-rate fertilization, and enhanced incorporation offering opportunities on nearly every row-crop acre in Minnesota—up to 8 million corn acres. Collectively, adoption of these practices, along with targeted use of cover crops and reduced tillage, could deliver significant water quality gains. Scenario goals should emphasize the practices farmers are most likely to adopt and acknowledge that drainage water retention and treatment are costly and best targeted to specific settings. Projections must be realistic, grounded in farm economics and current income data, to avoid unachievable expectations and more accurately reflect adoption potential.

**Action:** Emphasize scalable nutrient management practices and align goals with farmer adoption potential and economic realities.

**Program Tracking and Web Tools**

New tracking platforms should not be developed until existing tools are fully evaluated and optimized. Priority should go to farmer-facing decision-support tools that directly enable adoption and ensure resources deliver measurable outcomes. Tracking efforts should align with existing methodologies, practice-level frameworks, and the nutrient reduction and environmental benefits already documented through state and federal programs.

**Action:** Streamline programs and optimize existing tools before creating new platforms.

**Federal Policy and Continuous Living Cover (CLC) Crops**

The NRS includes statements suggesting that federal farm policy prevents widespread adoption of continuous living cover (CLC) crops, such as winter oilseeds or perennial wheatgrass, on Minnesota cropland. These statements misrepresent federal policy and overlook opportunities within existing programs that can support CLC adoption while managing farmer risk. Federal crop insurance can serve as an effective tool for mitigating risk associated with CLC crops. Under the Federal Crop Insurance Act, private companies or individuals may propose new insurance products through the 508(h) process (URL: https://www.rma.usda.gov/about-rma/fcic/private-sector-developed-plans), and crops with a purchase contract can be insured under the Crop Insurance Title of the Farm Bill. Scaling up CLC crops requires companies to commit to purchase these crops. **Adoption limitations are often driven more by market prices than policy constraints.**

The Commodity Title of the Farm Bill provides additional risk management through programs such as Agriculture Risk Coverage and Price Loss Coverage, which currently cover 22 commodities, including crops grown in Minnesota such as wheat, oats, barley, corn, dry peas, soybeans, sunflower seed, canola, and flaxseed. Many of these crops are cited in the NRS as needing increased acreage to support nutrient reduction. Importantly, several, such as oats, already have access to commodity program supports, highlighting that federal programs can provide both income and production risk mitigation. Participation in federal programs requires compliance with conservation provisions established in the 1985 Farm Bill, including Swampbuster and Sodbuster requirements. Farmers must annually demonstrate compliance with highly erodible land conservation (Sodbuster) and wetland conservation (Swampbuster) on acres enrolled in federal programs. These provisions ensure that participation in the federal safety net supports both risk management and environmental stewardship.

**Action:** Revise NRS language to accurately reflect federal policy opportunities and emphasize pathways—including crop insurance and commodity programs—that enable Minnesota farmers to adopt continuous living cover crops or other crop rotations while managing risk.

**Comments on Specific Chapters and Subsections**

*1.2.4 – Updated science on nutrient-reducing practices:* Over 80% of studies informing updated nitrogen removal practice efficiencies are from outside Minnesota, limiting their relevance to the state's unique soils, climate, and cropping systems. Incorporating locally generated research—including data from Discovery Farms, UMN studies, extension work, and local experts—is critical to ensure nutrient-reducing practices are accurately represented. **Until sufficient Minnesota-specific research is incorporated, recommended updated nutrient removal efficiencies should remain advisory in nature.** Additional clarification is needed on how these efficiencies align with existing methodologies, practice-level tracking frameworks, and the nutrient reduction and environmental benefits already reported through various state and federal programs.

*1.2.6 – Updated science on climate and other external influences:* The fourth bullet in this section, titled "More tile drainage," suggests that this will lead to increased nitrogen loss to Minnesota's surface waters. This oversimplifies nitrogen loss pathways. Nitrogen can also be lost through denitrification in

the form of nitrous oxide which can be magnified in anoxic conditions encountered when drainage is not present. Crop uptake can be compromised in these circumstances and lead to overall greater loss of nitrogen in the form of nitrous oxide. Given the cost of fertilizer, it is in the best interest of farmers to maximize productivity and crop uptake. Efforts should be made to minimize nitrogen losses in all forms and suggesting that the elimination of tile drainage will reduce overall nitrogen losses is a fallacy. This phenomenon applies to *any* crop that requires nutrients and is being optimized for production.

The Kuehner et al. (2025) study referenced multiple times in the report with respect to in-state nitrate trends (section 3.3.1) also included an analysis of nitrate concentrations in 18 tile-drained watersheds in the glacial till landscape of the Western Corn Belt Plains (WCBP). The study found that "56% (10) of the sites showed no trend, while 6% (1) were increasing, and 39% (7) were decreasing." The peer-reviewed paper goes on to say, "Analysis of stream trends over different climatic periods showed there were more 'no trend' or 'decreasing trends' in the glacial till landscape during wet years compared to the streams in the Driftless Area." These findings suggest that tile-drained watersheds reflect contemporary nitrogen management practices and can be used to document near-term effectiveness of these practices which may be delayed at the mainstream river locations.

The fifth bullet in this section, titled "More row crops," oversimplifies land-use dynamics and is misleading. Since the 2014 NRS draft, total row crop acres—particularly corn and soybeans—have remained stable. The claim that corn and soybean acreage has increased by about 140,000 acres per year implies a consistent, well-defined trend. Annual fluctuations of this scale fall within normal variation, driven by commodity prices, management decisions, crop rotations, and other factors. Moreover, declines in other row crops, such as wheat, are not a direct one-to-one offset. Without citing datasets or methodologies, the 140,000-acre figure overstates precision and underrepresents current realities. **This bullet should be removed entirely.** In fact, more than 300,000 acres of total cropland have been lost since 2018 according to the BWSR Statewide Conservation Lands Summary (URL: bwsr.state.mn.us/summary-conservation-lands-county). According to this summary, the proportion of cropland enrolled in conservation programs has grown modestly since 2018.

*2.6.1 – Effects of added agricultural practices:* The current framing risks overstating the scalability of drainage water retention and treatment practices. While acknowledging limited adoption, it does not reflect the substantial government investment required, nor the hesitation among many farmers to adopt these complex and costly practices. A more balanced framing would recognize that these practices play an important role in targeted settings but may not represent broadly scalable solutions across Minnesota. **The limited adoption feasibility of this practice category should be reevaluated and framed accordingly throughout the entire report.**

*5. – Key Messages:* **The current framing of in-field nutrient management practices downplays their role by emphasizing limited per-acre potential, even though collective improvements across large acreages can have a significant impact, which may give the impression that in-field management is a secondary or "less important" practice.** Additionally, recent research suggests predicting N mineralization and the use of biologicals also presents significant opportunities for in-field nutrient management, further

increasing their nutrient reduction potential.

- Refined language for balance:
  "**In-field nutrient management is an essential component of the solution.** Implementing in-field fertilizer and manure practices across millions of acres yields significant collective water quality benefits. Continued work to improve precision N and P management on every acre remains critical to achieving NRS goals."

*5.1.6 – Mississippi River Basin Scenarios:* The proposed 2040 scenario underutilizes opportunities to leverage stacked practice efficiencies and to maximize implementation on acres where practices are readily feasible. For example, field-edge treatment of tile water would require a nearly 25-fold increase over current adoption levels, yet experience and evidence indicate that such practices are unlikely to be scaled without substantial government assistance. As currently framed, the scenarios could make many producers feel that the 2040 goal is unachievable, given how far it is from a realistic adoption pathway**. To improve both feasibility and impact, 2040 scenarios should emphasize increased adoption of nutrient management, continuous living cover, and reduced tillage, which align with farmers demonstrated willingness to adopt and for which the existing infrastructure and technical support are already in place.** Prioritizing these practices can maximize both adoption and measurable water quality benefits while avoiding over-reliance on highly intensive practices unlikely to scale under current conditions.

*5.2.1 – Government and private sector nutrient management programs since 2014:* Recommend including narrative callouts only for programs that currently exist. For example, remove the Iowa Batch and Build program from this section and instead highlight the AgBMP Loan Program, which has demonstrated both high demand and scalability. The AgBMP Loan Program also maximizes private investment by leveraging low-interest financing, whereas Batch and Build would require more direct federal support. In regard to the "lessons learned" regarding the MAWQCP, it's important to note that the "indications of higher average net income that participating farmers earn" is corollary rather than causative. Farmers enrolled in the program likely manage all aspects of their operation economically and the fact that they are profitable is not attributed to the program. Finally, the information in section 6.2.3 would fit more appropriately in section 5.2 to complete the list of available programs and reduce redundancies.

*5.4.2 – Cropland management for landscape-level changes:* Under the section on conducting a statewide CLC campaign, the following statement appears: "If SAF is based on corn instead of CLC, this could work against making nutrient reduction progress in our water." However, Table 23 found within Chapter 5 of the appendix notes "Insufficient data" for winter oilseed relay crops relative to nitrate leaching. This section of the appendix cites a report by Ecotone Analytics et al. (2023) suggesting adoption potential in Minnesota of 12 million acres by 2050 for perennials and winter annual oilseeds. The report also states that this level of adoption could provide 23% N loss reduction for the state. This report was commissioned by an advocacy group called Friends of the Mississippi River and the report is only available for download after submitting personal information to the organization. The advocacy report has not been conducted by an agency, nor has it been through a peer-reviewed process and thus should

be omitted from the NRS.

*7.3.3 – Soil nutrient balance – estimating inputs and outputs:* Caution is warranted in interpreting watershed trends from fertilizer sales data and other sources with varying degrees of resolution. These data do not reflect fertilizer actually applied in the field (e.g., storage, off-season purchases) and can create a false sense of precision. Given these limitations, investing in a public-facing visualization tool at the HUC 10 watershed scale may be premature and of limited value, as the statewide trends identified align with patterns already observed through MDA fertilizer survey data. A more effective approach would focus on targeting rotation years where over-application is occurring and promoting broadly applicable practices such as timing, split applications, variable-rate fertilization, and enhanced incorporation—strategies with potential across up to 8 million acres to deliver significant water quality benefits.

In the case of phosphorus, the analysis in section 5.1.4 suggests that soil phosphorus build-up across watersheds appears to be highest in central Minnesota watersheds from a combination of manure and fertilizer. Soil testing is the best indicator of phosphorus build-up, thus promoting regular soil testing in the watersheds would be a more effective strategy for reducing potential exceedances of phosphorus applications. Farmers generally use soil testing as part of their nutrient management program particularly those that apply manure.

*7.5.1 – Indicators for change:* The last paragraph of this section discusses farm size and income trends. We recommend refocusing it on recent data rather than comparisons to the 1980s. **Current financial pressures are central to understanding the feasibility of conservation practice adoption, as farm income levels directly affect a producer's ability to invest in new practices.**

- Refined language for balance:
  "Significant changes in farm size and income have occurred in recent decades, shaping the dynamics of conservation practice adoption. The 2022 Census of Agriculture (USDA 2024b) reported 65,531 farms in Minnesota, down from 94,382 in 1982, with the average farm size increasing from 294 to 388 acres over that period. Since the last version of this report in 2014, farm income trends in Minnesota have been highly variable, with sharp declines in recent years. In 2024, median net farm income fell to just $21,964 — the lowest level this century — driven by declining crop prices and below-trendline yields. Farm profitability has eroded since 2022, leaving many producers with reduced working capital, limited net worth growth, and minimal profitability. These financial realities are critical context for assessing farmers' capacity to adopt conservation practices. Looking forward, farm income trends will remain one of the most important factors influencing whether producers can invest in new conservation measures."

*7.6.5 – Concepts for future tracking and visualization tool development:* Table 7.8 lists eight potential tools to support NRS progress tracking. Before investing in new platforms, it would be useful to assess whether existing tools are being used, by whom, and how effectively. Adding layers to current tools may offer greater efficiency than creating new ones. **Importantly, there is a notable gap in tools designed to directly support farmer decision-making—resources that are essential to drive practice adoption and**

**landscape-scale change.** Without careful coordination, additional tracking tools risk creating confusion, redundancy, and unnecessary costs.

*8.3 – Next Steps: an Updated Roadmap for NRS Success:* Item number 3 under Question 3 second bullet may unintentionally suggest inadequacy or non-compliance with the Groundwater Protection Rule, which is already fully implemented and enforceable. Suggest removing "including regulatory requirements where voluntary efforts are unsuccessful" as the language implies inadequacy and/or non-compliance.

- Refined language for balance:
  "Through continued implementation and enforcement of the Groundwater Protection Rule, alongside local and state support efforts."

*8.3 – Next Steps: an Updated Roadmap for NRS Success:* Item 4 under Question 3 suggests developing a nitrogen endorsement for the Minnesota Agricultural Water Quality Certification Program (MAWQCP). Instead, the UMN Nitrogen Smart certification program should be offered as an alternative. For clarity, we recommend ending the third sentence of this section at "leaching." In addition to continuing and expanding MAWQCP and Minnesota Office for Soil Health programs, this section should also reference the Soil Health Financial Assistance Grants and the AgBMP Loan Program. Finally, we recommend removing the linked Iowa Nutrient Research and Education Council example, as it is not currently operational and does not directly support on-farm practice improvements.

Minnesota Corn appreciates the Minnesota Pollution Control Agency's leadership in updating the NRS and the opportunity to provide input on its direction. We encourage continued emphasis on evidence-based, voluntary strategies that support measurable nutrient reductions while recognizing the practical and economic realities facing Minnesota farmers. We look forward to ongoing engagement as the state advances implementation of the Strategy to meet its 2040 nutrient reduction goals.

Sincerely,

Adam Birr, Ph.D.
Executive Director
Minnesota Corn Growers Association Minnesota
Corn Research & Promotion Council
abirr@mncorn.org
www.mncorn.org