Larry Gunderson  
Pesticide and Fertilizer Management Division  
Minnesota Department of Agriculture  
625 Robert Street North St. Paul, MN 55155

Dear Mr. Gunderson,

The Minnesota Association of Wheat Growers is commenting on the proposed Nitrogen Fertilizer Rule on behalf of our members. Our members live and farm throughout Minnesota, however, they are concentrated in northwest Minnesota.

Nearly all of our members and their neighbors rely on groundwater for drinking water, whether it is from private wells or public systems. We want to continue relying on it for a long time to come, so we are very concerned about maintaining or improving its quality for ourselves and future generations.

We are concerned with the Minnesota Department of Agriculture’s proposed Nitrogen Fertilizer Rule which covers the entire state in a single blanket. Minnesota is a very large state with diverse regions, topography, geology, climates and agriculture systems. These regions deserve local and regional approaches to improving or maintaining ground water quality rather than one blanket regulation, like Part 1 of the proposed rule.

For many regions, Part 1 of the rule offers a preventative step to maintain the good groundwater quality that currently exists, as it does in northwest Minnesota. With prevention in mind, there are many local and regional practices that should be considered and encouraged, instead of regulating just one practice (fall N applications) that does not help to the same degree in each unique region of the state. It is important that we encourage all preventative steps, not just one. For northwest Minnesota, we believe fall application of nitrogen when applied appropriately, at the right time and in the right place, should be an acceptable practice. The Minnesota Department of Agriculture should work with local and regional stakeholders and experts to determine all of the appropriate management practices in combination that make fall application of nitrogen acceptable.

In northwest Minnesota, where fall application of nitrogen has been a common practice for many years, there should be some evidence of a problem or future problem before moving to regulation. In addition, without local input and knowledge, the regulation in Part 1 may not be the best approach to prevention and cause consequences that the MDA may not have thought about or considered. Many farmers have already adopted site-specific management strategies which help prevent nitrogen loss. The practices include use of nitrogen inhibitors, stabilizers, poly coated urea, split nitrogen applications and for some fields or parts of fields, spring-only nitrogen applications.

Farmers and researchers know there is seldom a single solution to solving a complex problem. As in research, it takes multiple approaches to solve most complex problems. All of the local and site-specific strategies should be better understood and encouraged before proceeding to regulation in a region where there is no evidence of a current or emerging problem.

Although the Minnesota Department of Agriculture does not have any township testing results in northwest Minnesota, one grower contacted the Minnesota Pollution Control Agency, which has a database of water tests from all new wells drilled since 1990. In Polk County, there have been 1,700 wells drilled and only 4 tested over the 10 ppm drinking water threshold for nitrates. The database did not indicate the likely source of the nitrate. However, because of such a large database, it does indicate the groundwater in that county is of high quality, even though a large portion of Polk County is in the vulnerable groundwater area as defined in the rule. We believe this data is available for all counties in the state. Well testing or evaluating previously completed testing should be done in an area to determine current issues or identify emerging problems before regulations are implemented.

We suggest you drop Part 1 including the vulnerable area map from the rule. The MDA should consider implementing Part 1 into Part 2, possibly when an area has moved to a regulatory mitigation level as defined in Part 2. Currently, Part 1 creates regulations without taking into account local input and knowledge for developing regional approaches that can help maintain or improve groundwater quality. If Part 1 were moved into Part 2, it would allow for a more local and regional approach because Part 2 provides for local advisory team involvement, unlike Part 1, which does not.

It is our understanding that Part 1 prohibits fall application of nitrogen in areas of the state that meet the Kstat 10 Micrometers per second or 1.4 inches per hour parameter in the first 5 feet of soil. We understand that it does not take into account soil layers below the first five feet, nor does it take into account the regional factors that may contribute to more or less movement of nitrogen into groundwater. Prohibiting fall nitrogen application on soils with 10 Micrometers per second Kstat value should not be a blanket regulation across all regions of the state because of the regional differences such as rainfall, temperatures, length and intensity of freeze up, cropping systems and land use.

We provide the following maps and comments as visual illustrations on how different Minnesota can be from region to region and to demonstrate the need for a regional approach to maintaining and improving ground water quality.
Regional Differences in Minnesota’s Rainfall and Temperature

Average October Precipitation and High and Low Temperatures

It is recommended that fall-applied nitrogen be applied only after soil temperatures at 6 inch depth stabilize below 50 degrees. The maps above show the average temperatures and rainfall for the month of October in Minnesota. You will note that October average rainfall declines significantly as you move from southeast to northwest in Minnesota. Temperatures also decline as you move northward. With the lower temperatures and lower rainfall in this period, there is less risk of leaching. October and early November is typically when fall nitrogen applications are made in northwest Minnesota.

Source: All maps from High Plains Regional Climate Center
The November average rainfall map above shows that Minnesota rain totals range from .6 inches to more than 1.8 inches, a threefold difference. This illustrates how there are large regional differences in a big state like Minnesota. Again, the amount of rainfall declines as you move north and west in the state. Less fall rain and colder temperatures with frozen soil would reduce the risk of nitrogen leaching and infiltration into groundwater supplies.
The March maps show the large regional differences in the state. In the northwest the soils are still frozen while other parts of the state are thawed. A longer period of frozen soils, deeper frost levels and less precipitation would reduce the risk of nitrogen leaching.
Average April Precipitation and High and Low Temperatures

Similar to November, rainfall in April shows a two and half times difference in the state, with the monthly average going from 1 inch to more than 2.5 inches in different part of the state.
May rainfall amounts are higher throughout the state as compared to October, November and April. However, they still follow the pattern of lower amounts as you move north and west. The May temperatures appear to be less variable throughout the state as compared to the other months. We note that in areas with wheat production, May and June are months of rapid plant growth and uptake of nutrients.
Regional Differences in Minnesota’s First and Last Freeze Dates

The First Fall Freeze maps above illustrate that the first 24 degree freeze in the fall is at least 20 days earlier in the north as compared to the south. The Last Spring Freeze map above illustrates that the last 20 degree freeze in the spring is at least 25 days later in the north as compared to the south. This overall longer period of freezing (frozen soil period and depth) coupled with less rainfall, reduces the risk of nitrate leaching into the groundwater and should be accounted for in the vulnerable area determinations.

Regional Differences in Minnesota’s Cropping Systems

The cropping systems changes as you move north and west. The map above illustrates that the number of acres in wheat production is much higher in the northwest part of the state. Wheat production requires similar levels of nitrogen as compared to corn; however wheat’s high demand for nutrient uptake comes earlier in the growing season. This along with the differences in rainfall and temperature should be consider and incorporated into the determination of vulnerable areas.

In addition to wheat production, there is close to 50,000 acres of turf grass production in Minnesota.

In northwest Minnesota, there are a large number of crops that grower incorporate into their rotations, such as alfalfa, barley, dry beans, soybean, wheat, sugarbeet, turfgrass seed, and corn. Seldom are two high nitrogen use crops planted back to back.

Regional Differences in Minnesota’s Land Use

As you move west and north, there is more land devoted to CRP and other non-crop uses. This should be considered and incorporated into any vulnerable area determination.
In addition to the regional differences, growers with local knowledge of soils have indicated that the vulnerable area map is not accurate because it includes areas of heavy clay soils. The MDA should work with local experts, such as growers, crop consultants and SWCD staff, to ground truth any vulnerable area map or designation that is made. Some of the land in the vulnerable area of northwest Minnesota is more likely to experience nitrogen loss due to denitrification, because of saturated soils, then to infiltration and leaching typically associated with course soils.

Thank you for your consideration of our comments.

We look forward to working with you as you develop local and regional advisory and education teams in the wheat growing areas of Minnesota.

Sincerely,

Tim Osowski, President
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