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Subject:	comments on draft 2013 MN Nitrogen Fertilizer Management Plan
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General comments on the 2013 MN Nitrogen Fertilizer Management Plan

Generally the document to a good job at outlining the history and trends for the problem.

While there are some minor successes in addressing the problem, as the report and results show there has been little progress in reduction of nitrogen in groundwater. In some areas of the state, levels continue to rise. So in effect, the plan has not worked as intended so other approaches must be used.

Personally, I live in a rural area just SW of Hastings, MN in an outwash plain. The well is surrounded by agriculture with the nearest row crops ranging form 130 meters to 180 meters in all directions except south. I have seen my nitrate levels rise in my well system steadily over the last decade to where it has exceeded the EPA limit. I regularly check my well on average of at least once a year if not more.

Since Ag is the dominant problem, economics is the major driving force for any substantial change. Unless we change the economic driving force, BMP's or other 'incentives' will not work. Local property taxes with state and federal farm policies ultimately drive the economic forcing mechanism.

One alternative that was only mentioned by name is precision agriculture. With 'true' precision ag, the entire process of inputs and outputs is measured across the farmland down to a square meter. Thus not only does the farmer know how many bushels he or she may be growing on every square meter through the use of 'quantity' yield monitors on combines but they also know through the use of 'quality' yield monitors the amount of nutrients removed in the grain through the percent oil or protein. This is very important because it allows the farmers to reapply the exact amount of nutrients removed every year instead of the blanket approach. So on average, there should not be any nitrogen runoff or loss into the groundwater since there is not excess nitrogen available.

This technical approach continues to be research and tested for over a decade by Dr. Dan Long, USDA ARS and others. I first met Dan when I was part of a small team (Case IH, Textron, NRCS) looking at quality yield monitors in the late 1990's. As you can see by the link below, Dr. Dan Long continues to be one of key people looking at Precision Nitrogen Management:

http://www.ars.usda.gov/pandp/people/people.htm?personid=35825

"I am investigating how information from on-combine yield monitors and optical sensors can be applied into N management thereby improving grain quality and yield. Because of the correlation between grain protein and plant N nutrition, optical sensing provides an opportunity for growers to use grain protein maps to assess spatial variability in soil N fertility levels. This approach could lead to improved soil sampling protocols that direct sampling to areas of a field that are deficient in N. Plus, the resulting grain protein maps can also be a useful post-harvest indicator of whether the N supply was sufficient for optimum wheat yields."

So here is a technical approach that does work but how does one implement it?

Talking last month one-on-one with Dr Tom Peters, Director of Biotechnology, Monsanto (former head of Monsanto's Precision Ag Research), getting farmers to add 'quality yield monitors' is just part of the bigger problem. An Ag Information Infrastructure (AII) system is needed for the farmer, the county assessor, as well as the regulator. The AII needs to be structured so the farmer can easily see the inputs (seed, fuel, herbicide rates, fertilizer rates, etc.) and outputs (yield, runoff, nutirents removed, etc) across every square meter on the farm. The results are then automatically analyzed for on-going treatments as well as to plan for next year's crops where both the economic gains are maximized AND environmental impacts are minimized.

The county assessor also needs this information to more fairly assess each landowner based on their soil variability instead of blanket assessments.

In a form that protects private information, the regulators also need to know these inputs and actions from farmers to insure both a level playing field but also to assess whether further actions are warranted.

As the report shows, the State of Minnesota has diverse geology, soils and climate. Making the system be fair will be a challenge since there are farming areas like SE and SW Minnesota which have high nitrogen levels. Policy will be needed to provide

Sincerely,

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