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# **Institute of Ag Professionals**

Proceedings of the

## **2015 Crop Pest Management Shortcourse &**

### **Minnesota Crop Production Retailers Association Trade Show**

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# Nitrate in Groundwater: Well Testing Results and the Nitrogen Fertilizer Rule

For the MCPR Short Course  
December 10, 2015

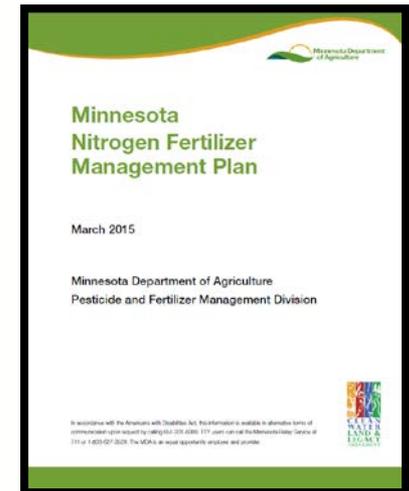
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# Nitrogen Fertilizer Management Plan (NFMP)

- Many wells exceed the health standard for nitrate in areas where groundwater is vulnerable to contamination
- The NFMP is the state's blueprint for minimizing groundwater impacts from the use of nitrogen fertilizer
- Has voluntary and regulatory components
- Revised in March 2015



# Nitrate Leaching from Fertilizer

- A very challenging problem
- Under row crop production in vulnerable soils, nitrate leaching will occur
- Losses may vary significantly between years due to weather
- May be long lag times (*years*) between changes in practices and changes in groundwater quality
- Enormous variability *between* and *within* aquifers

**There is no simple solution**

# The Revised NFMP

1. An emphasis on prevention;
2. Extensive testing of private wells by township;
3. A new phased approach to assessing and prioritizing areas with nitrate contamination;
4. An emphasis on involving local producers and communities in problem solving through local advisory groups; and,
5. Promoting alternative management tools (AMTs) – changing land management in targeted areas.

# Phased Approach

- A four phase (level) approach based on percent of wells exceeding the nitrate drinking water standard
- Two levels are voluntary, two are regulatory
- Starts with one of the voluntary levels
- Becomes regulatory only if BMPs are not voluntarily adopted

# Nitrate Reduction Strategies

- Adoption of the nitrogen fertilizer Best Management Practices (BMPs)
- Increased low nitrogen vegetative cover (perennial crops, forages and cover crops) or taking land out of production in targeted high risk areas

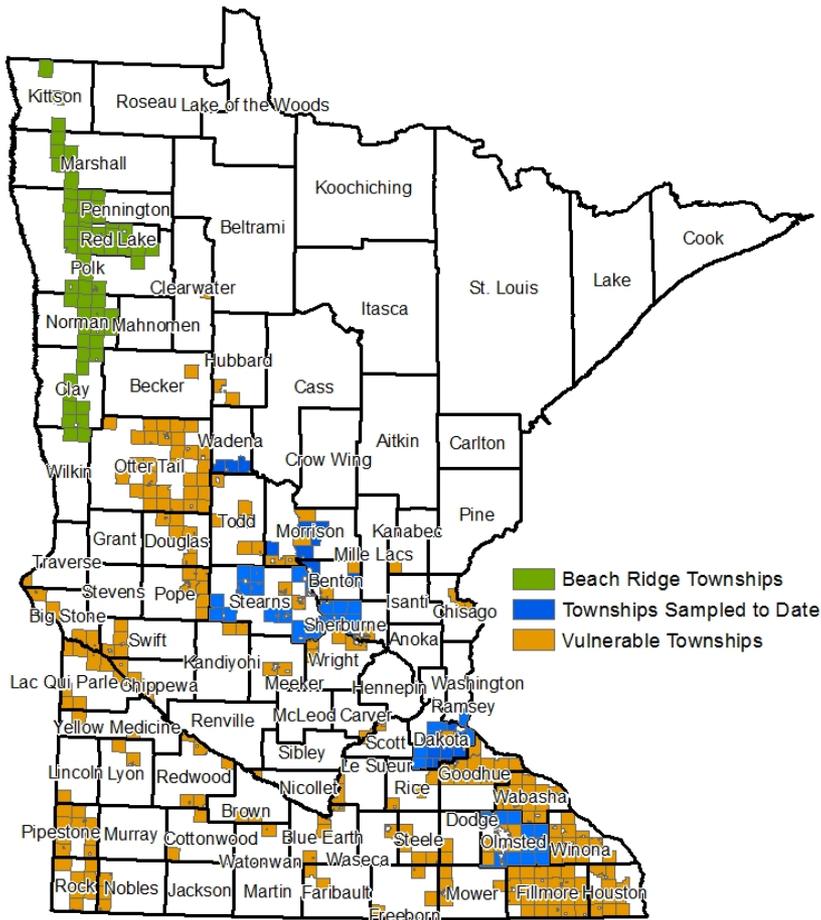


# Township Well Testing Program

- In townships with vulnerable groundwater and significant row crops
- Partnership effort with local government
- Includes all private wells (up to 70,000 wells)
- Voluntary
- No cost to owner – funded by the Clean Water Fund
- If nitrate is detected follow-up sampling is conducted for pesticides

# Township Testing

Approximately 280 to 300 townships with row crop agriculture and vulnerable groundwater, or history of high nitrate will be tested



# Two Step Process

## Step 1 – Initial test

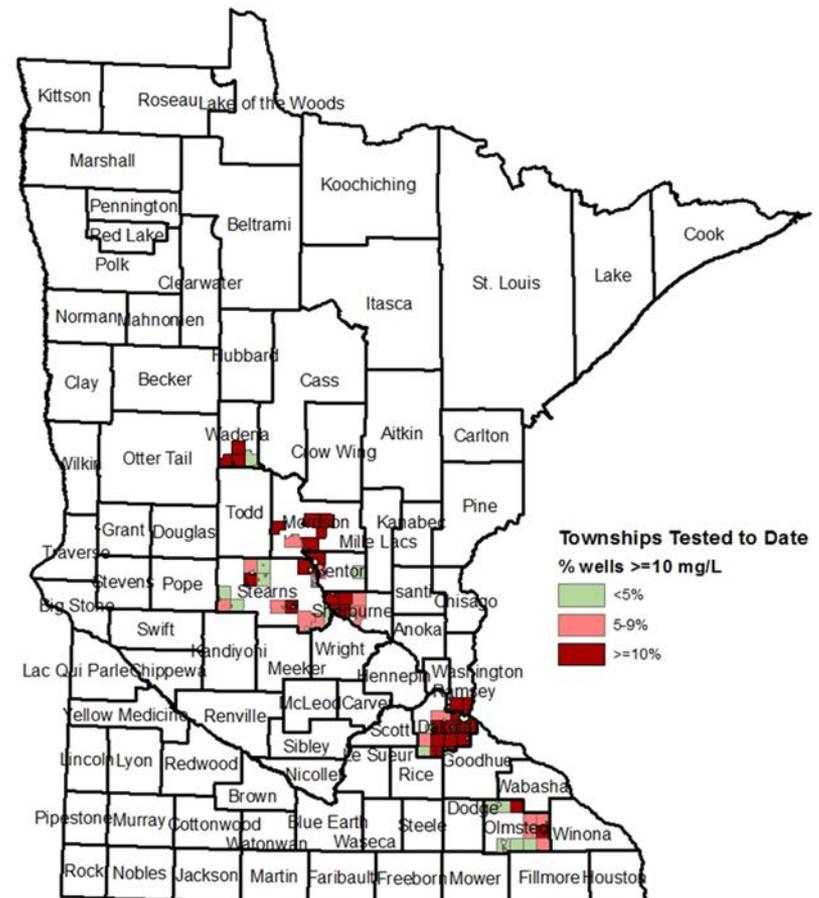
- Work with local partner (SWCDs or County)
- All well owners are offered a free nitrate test kit
- Homeowner collects sample and mails it in

## Step 2 – If nitrate is detected:

- Collect follow-up nitrate and pesticide samples
- Samples collected by trained staff

# Preliminary Results For 2013-2014

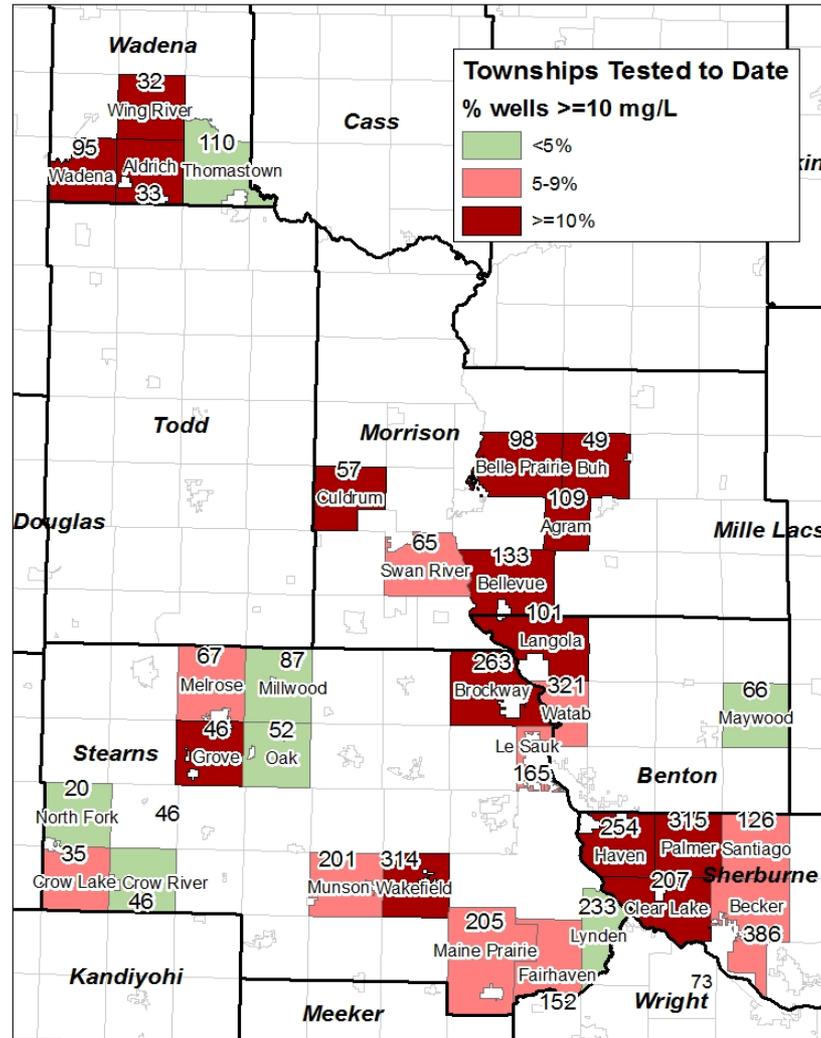
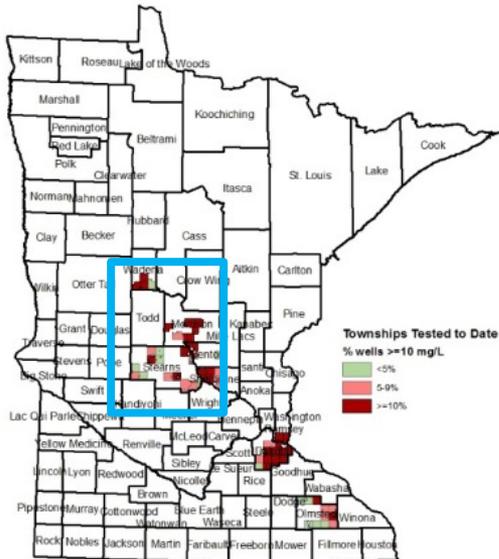
Percent of Wells above the Standard (10 mg/L Nitrate-N)	Number of Townships
Less than 5%	14
5%-9.9%	17
10% or more	29
<b>Total</b>	<b>60</b>



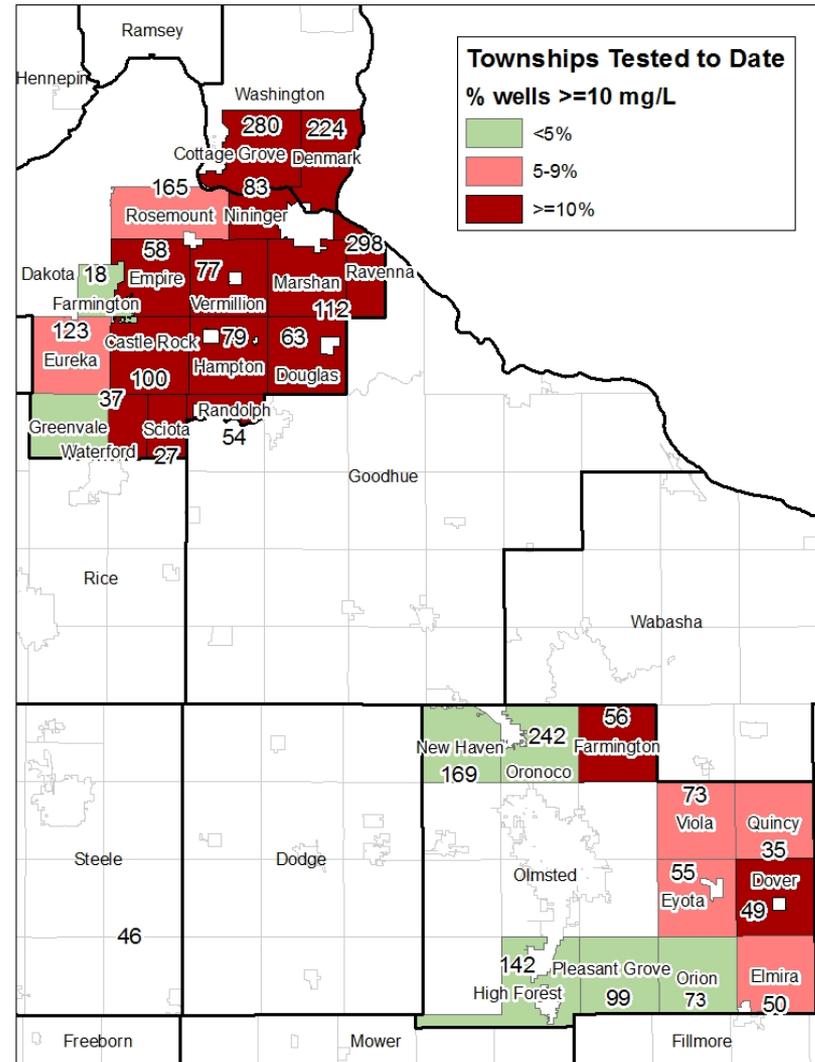
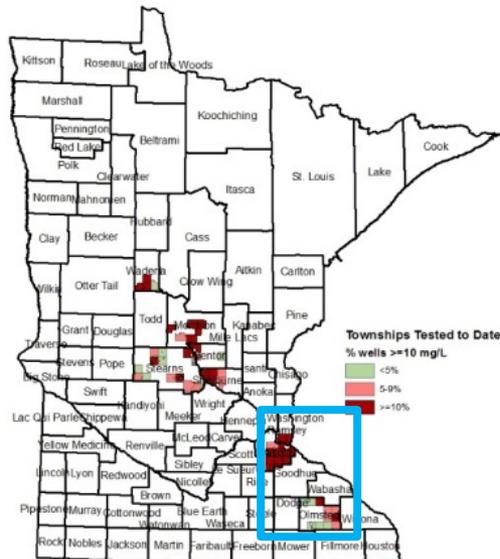
- Approximately 7342 wells were sampled
- 13% (982) of those wells were  $\geq$  HRL

Does not include hand dug wells or wells with unclear locations  
Results are preliminary and subject to change

# Results for Central Minnesota



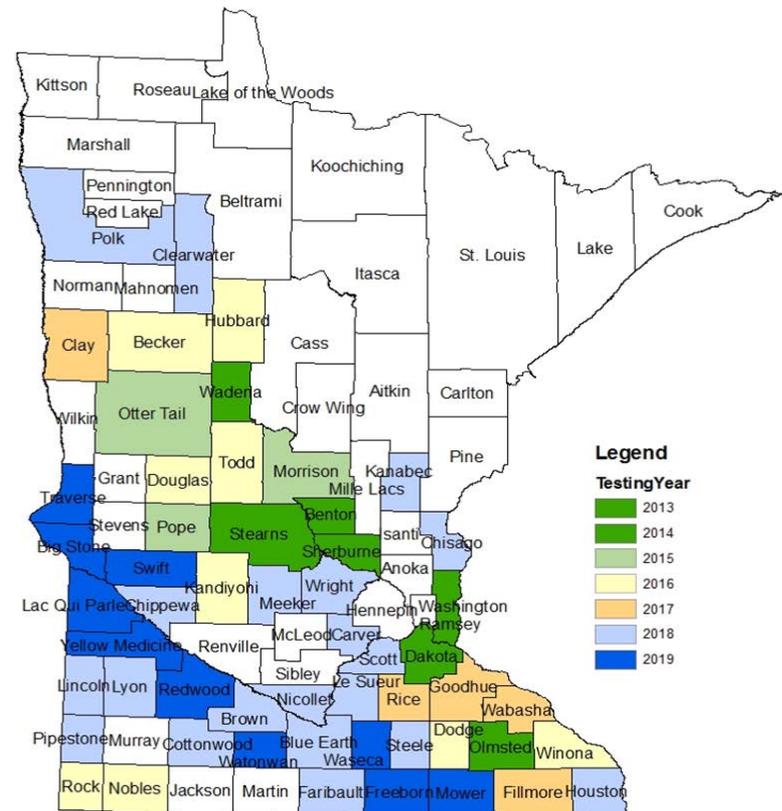
# Results for SE Minnesota



# Testing Schedule

- Sampling will occur over several years
- The first round of sampling should be completed by 2019

Tentative Township Testing Schedule  
(subject to change)



# Nitrogen Fertilizer Rule

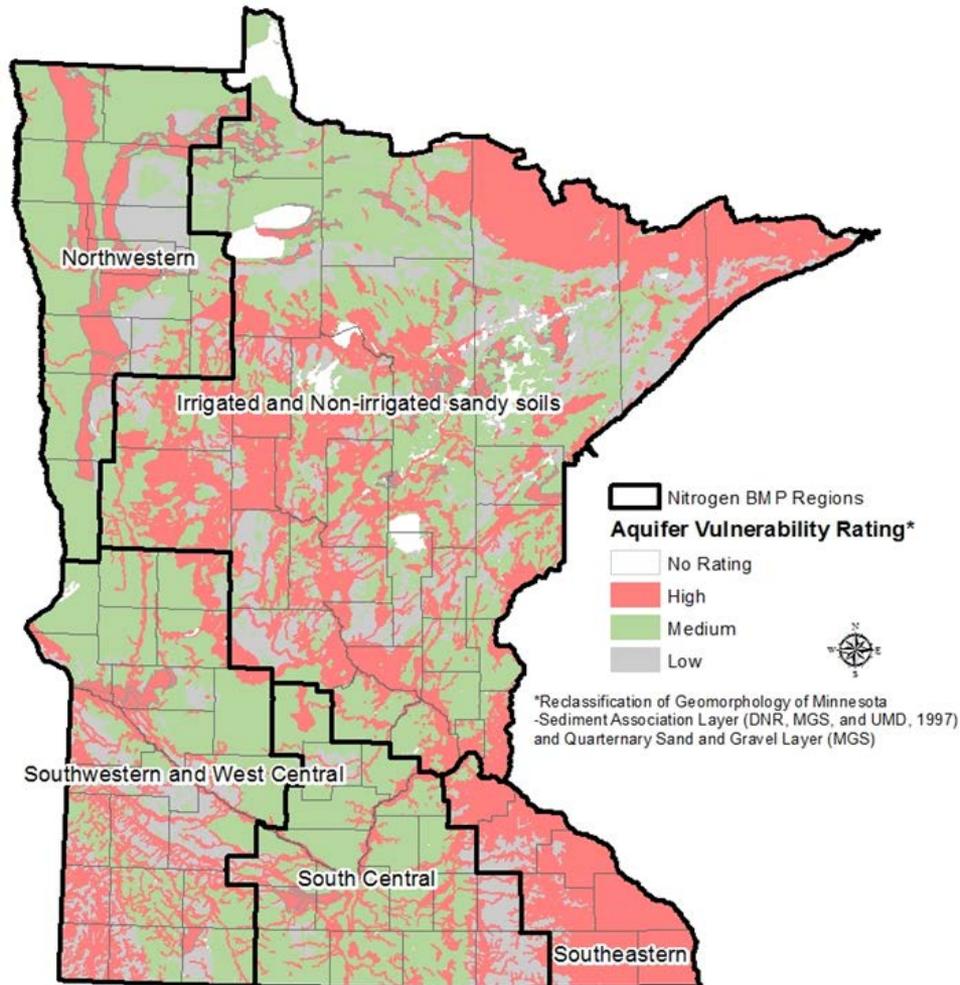
- **Part One**— Restrict application of nitrogen fertilizer in the fall and to frozen soils in areas vulnerable to groundwater contamination
- **Part Two**—Place the process for moving to regulations, as outlined in the NFMP into rule

# Nitrogen Fertilizer Rule – Part One

Applies to areas with vulnerable groundwater

These may include:

- Coarse textured soils
- Shallow fractured bedrock (karst)
- Elevated nitrate in local wells
- Defined as vulnerable by the DNR based on groundwater infiltration rates



# Nitrogen Fertilizer Rule – Part Two

The NFMP process for moving to regulations will be placed into rule

- Generally based on township(s) or source water protection area
- Selected from a list of options based on local and regional conditions
- Input from local advisory committee
- Only regulate if BMPs are not adopted
- Applied on a site specific basis via Commissioner's Order

# Part Two Rule Process

## Regulatory Options:

- Appropriate Regional BMPs
- Record keeping
- Attend training
- Collect well water samples
- Credit N from previous crop and manure
- Soil Testing
- Nitrification inhibitor
- Irrigation Management



**Local Advisory Team**



**Commissioner's Order**



**Example Commissioner's Order:**

- Record keeping
- Credit nitrogen from all sources
- Soil testing
- Select BMPs

# Request for Comments

- MDA is currently requesting comments on content for the rule
- Comment period ends January 29, 2016
- More information on the MDA website

# Thank you!

Dan Stoddard

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For more information:

<http://www.mda.state.mn.us/nfmp>