On behalf of the Minnesota Department of Agriculture, thank you for the Pomme de Terre 1W1P notification letter. We appreciate the invitation to submit water management issues and concerns. As a first step to planning for the 1W1P, we have compiled the following information for use by the team – it goes along with what Ryan Lemickson presented as MDA's priorities at the 1W1P meeting this past Monday.

Minnesota Department of Agriculture Pesticide Water Quality Monitoring

The Minnesota Department of Agriculture (MDA) has been conducting pesticide monitoring in ground water since 1985, and in surface waters since 1991. Annually, the MDA completes approximately 250 sample collection events from ground water and 800 sample collection events from rivers, streams, and lakes across the state. In general, the MDA collects water samples from agriculture and urban areas of Minnesota and analyzes water for up to approximately 140 different pesticide compounds that are widely used and/or pose the greatest risk to water resources. All groundwater monitoring is conducted by MDA staff. Surface water monitoring is conducted by MDA and local organizations. All monitoring is completed following annual work plans and standard operating procedures (SOP's) developed by the MDA.

The purpose of the MDA's pesticide monitoring program is to determine the presence and concentration of pesticides in Minnesota waters, and present long-term trend analysis. Trend analysis requires a long-term investments in monitoring within the MDA's established networks. The MDA releases an annual water quality monitoring report that includes all pesticide water quality data and long term trends available at www.mda.state.mn.us/monitoirng. The MDA will continue to conduct statewide pesticide monitoring in the future and will provide additional information related to the occurrence of pesticides in Minnesota waters.

Nitrogen and Pesticide Use

The MDA surveys farmers through the National Agricultural Statistics Service (NASS). A summary of the data is attached as a PDF to this email. The most recent nitrogen use survey was for the 2014 crop year and the most recent pesticide use survey was for the 2013 crop year. For reference, the University of Minnesota fertilizer recommendations are found here: http://www.extension.umn.edu/agriculture/nutrient-management/nutrient-lime-guidelines/fertilizer-recommendations-for-agronomic-crops-in-minnesota/index.html

The attached nitrogen use information is from the 2014 nitrogen use report, specifically the Southwestern and West Central BMP regions. Based on the information attached, the MDA would suggest that nutrient management be encouraged as a strategy to meet water quality goals. This would

encouraging producers to collect soil nutrient samples, and to test their manure to identify the N & P that could be credited.

Nitrates are a priority resource concern for MDA in this region for both ground and surface water.

Pesticide use information is available from the 2013 pesticide use report, the watershed falls within the West Central (6) and Northwest (1) Pesticide Management areas. http://www.mda.state.mn.us/chemicals/pesticides/pesticideuse/agpestsalesstatewide.aspx

Groundwater

The MDA has three monitoring wells within the Pomme de Terre watershed. Monitoring in these wells began in 2014 and is ongoing. To date, a number of pesticide compounds and nitrate have been detected in the wells. The compounds and concentrations detected in groundwater to date are

comparable to what is detected in other watersheds in the state. MDA does not have any plans to expand groundwater monitoring within the watershed.

Surface Water

The MDA completed 9 pesticide and/or nutrient water quality sample collection events from 6 different lakes from 2007 through 2012, and 12 pesticide and/or nutrient water quality sample collection events from 9 river or stream locations from 2003 through 2010 within the Pomme de Terre River Watershed. There are no current pesticide water quality impairments in the watershed, however, the insecticide chlorpyrifos and herbicides acetochlor and atrazine have been identified as surface water pesticides of concern in Minnesota. There are several pending chlorpyrifos impairments in watersheds in southwestern and south central Minnesota.

Agricultural Edge-of-Field (EOF)

The MDA does not have any EOF sites in the watershed.

Township Testing Program

The northern portion of the Pomme de Terre Watershed does have townships which fall within MDA's Township Testing Program. The MDA has identified townships throughout the state that are vulnerable to groundwater contamination and have significant row crop production. More than 70,000 private well owners will be offered nitrate testing in over 300 townships per 2019. The sample schedule can be found on a handout downloadable here , which includes more background information. The initial sampling for townships within Otter Tail County are complete and the results can be found the following pdf link: http://www.mda.state.mn.us/~/media/Files/chemicals/nfmp/nitrate2015otter.pdf Thirty-two (32) vulnerable townships were tested, only 4% of the wells tested were over the nitrate health standard. The final report for Otter Tail County will be available in 2018.

Additional MDA Resources

Since there is a significant portion of the watershed in agricultural production, we would like to bring to your attention a couple resources, listed below, that we encourage you to reference during the planning process.

The Ag BMP Handbook (*currently in the process of updating the 2012 edition*) provides a comprehensive summary of BMPs that are practical for Minnesota: http://www.mda.state.mn.us/protecting/cleanwaterfund/research/agbmphandbook.aspx

The 2015 Nitrogen Fertilizer Management Plan (NFMP): http://www.mda.state.mn.us/nfmp

A couple opportunities for BMP funding or cost-share:

The Minnesota Agricultural Water Quality Certification Program (MAWQCP) is a voluntary opportunity for farmers and agricultural landowners to take the lead in implementing conservation practices that protect our water. Those who implement and maintain approved farm management practices will be certified and in turn obtain regulatory certainty for a period of ten years. This is a planning program that should be included in the IWIP because it is an opportunity for agricultural producers to evaluate nutrient and field management practices within the watershed to reduce losses. There are currently two

(2) certified producers in the Pomme de Terre Watershed, totaling 1,300 acres; however, 8,000 additional acres are currently going through the certification process.
http://www.mda.state.mn.us/awqcp

The AgBMP Loan Program is a water quality program that provides low interest loans to farmers, rural landowners, and agriculture supply businesses. The purpose is to encourage agricultural Best Management Practices that prevent or reduce runoff from feedlots, farm fields and other pollution problems identified by the county in local water plans. http://www.mda.state.mn.us/agbmploans

The Nutrient Management Initiative (NMI) assists farmers and crop advisers in evaluating nutrient management practices on their own fields. This is a great opportunity for crop advisers to promote new management strategies and equipment that is available to boost yields and fertilizer efficiency for farmers, which will help reduce unnecessary losses to our water resources.
http://www.mda.state.mn.us/nmi

We look forward to being involved in the 1W1P process. Ryan Lemickson will continue to be the MDA representative on the team. If you have any questions please do not hesitate to contact either Ryan or myself.

Thank you for your coordination,
Heidi

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DEPARTMENT OF AGRICULTURE

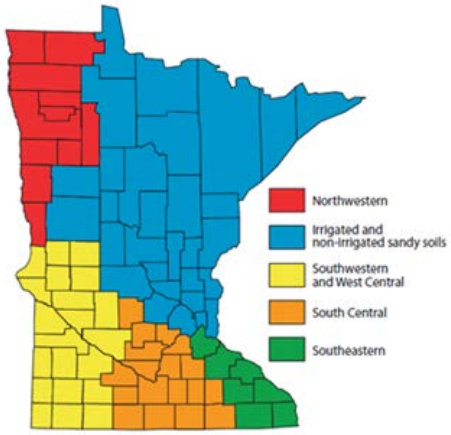
Pomme de Terre Watershed
One Watershed One Plan

Minnesota Department of Agriculture
Nitrogen and Pesticide Use

The Minnesota Department of Agriculture surveys farmers through the National Agricultural Statistics Service. The most recent nitrogen use survey was for the 2014 crop year and the most recent pesticide use survey was for the 2013 crop year.

The following nitrogen use information is from the 2014 nitrogen use report, specifically the Southwestern and West Central BMP region.

Minnesota Nitrogen Best Management Practices Regions



Nitrogen use in the Pomme de Terre Watershed: 2014 Crop Year

More than five responses are required for any individual category to be reported.
No manure fields are included in the fertilizer section.

Fertilizer section

Figure 1 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following soybeans; the corresponding corn yields are detailed in red.

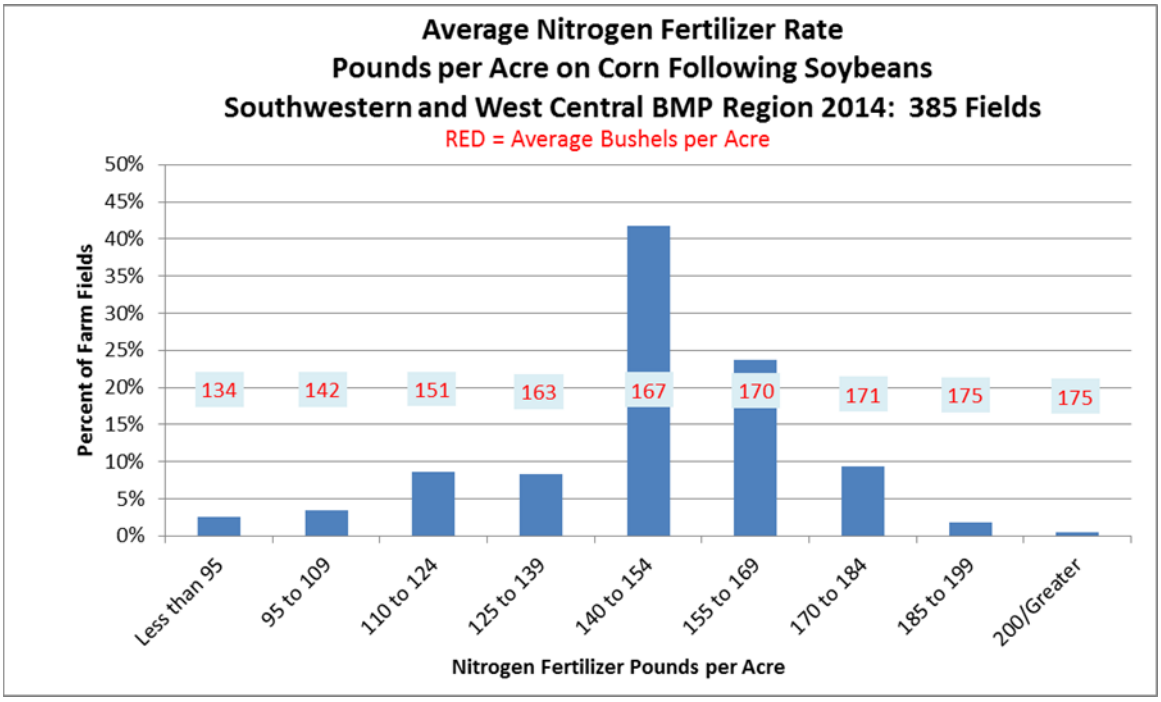


Figure 1. Average nitrogen fertilizer rates and yields on corn following soybeans in the SW BMP region for 2014: 385 fields.

In the SW BMP region, nitrogen fertilizer rates ranged from an average of 121 pounds per acre in Lincoln County to 157 pounds per acre in Redwood County as shown in Table 1.

Table 1. Average county nitrogen fertilizer rates and corn yields for the SW BMP region for corn following soybeans.

Average County Nitrogen Fertilizer Rates for the SW BMP Region for corn following soybeans			
County	**Number of Farm Fields**	**Average Nitrogen Rate Pounds per Acre**	**Average Corn Yield Bushels per Acre**
Big Stone	8	126	143
Chippewa	21	148	165
Cottonwood	23	148	172
Douglas	16	126	146
Grant	7	141	160
Jackson	29	151	175
Kandiyohi	14	146	167
Lac qui Parle	16	144	164
Lincoln	11	121	156
Lyon	22	145	158
Murray	23	150	171
Nobles	32	146	169
Pipestone	12	141	163
Pope	19	147	162
Redwood	38	157	173
Renville	31	150	159
Rock	5	151	181
Stevens	15	146	158
Swift	11	147	176
Traverse	11	152	156
Yellow Medicine	21	145	162

Figure 2 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn; the corresponding corn yields are detailed in red.

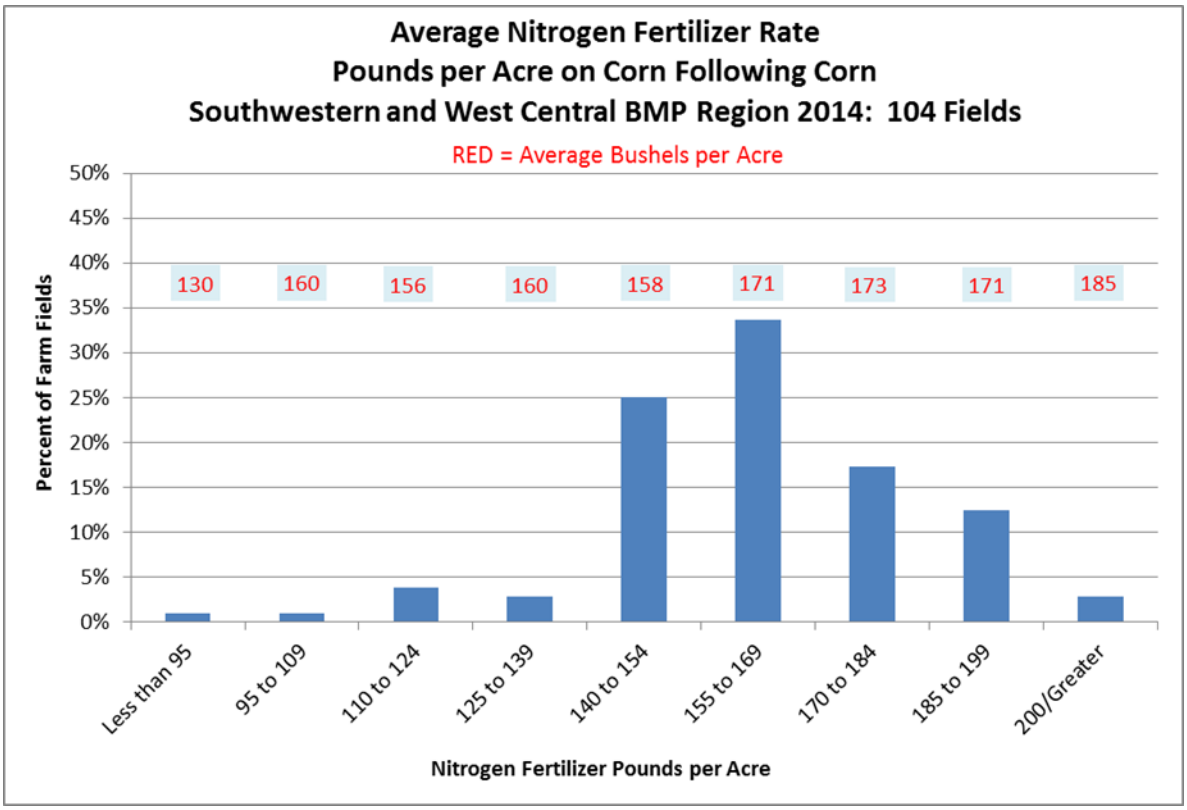


Figure 2. Average nitrogen fertilizer rates and yields on corn following soybeans in the SW BMP region for 2014: 104 fields.

In the SW BMP region, nitrogen fertilizer rates ranged from an average of 138 pounds per acre in Lyon County to 177 pounds per acre in Renville County as shown in Table 2.

Table 2. Average county nitrogen fertilizer rates and corn yields for the SW BMP region for corn following corn.

Average County Nitrogen Fertilizer Rates for the SW BMP Region for Corn Following Corn			
County	**Number of Farm Fields**	**Average Nitrogen Rate Pounds per Acre**	**Average Corn Yield Bushels per Acre**
Big Stone	**	**	**
Chippewa	5	173	169
Cottonwood	5	156	179
Jackson	10	164	176
Kandiyohi	6	165	157
Lac qui Parle	**	**	**
Lincoln	**	**	**
Lyon	5	138	157
Murray	9	166	173
Nobles	5	165	185
Pipestone	6	168	163
Pope	**	**	**
Redwood	15	157	168
Renville	5	177	164
Rock	6	165	176
Stevens	6	157	154
Swift	7	162	162
Traverse	**	**	**
Yellow Medicine	**	**	**

****** Less than five responses**.**

Figure 3 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following corn following alfalfa; the corresponding corn yields are detailed in red.

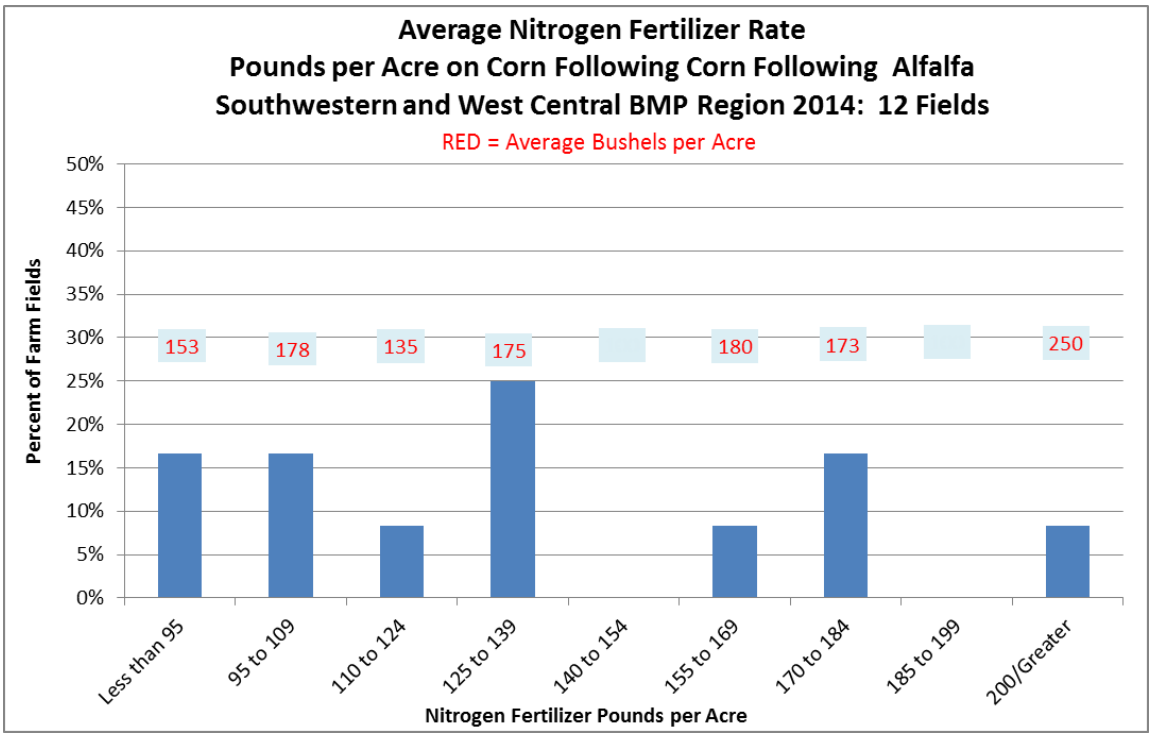


Figure 3. Average nitrogen fertilizer rates and yields on corn following corn following alfalfa in the SW BMP region for 2014: 12 fields.

Less than five fields were included in the SW BMP Region for corn following corn following alfalfa county analysis, therefor there is no discloser of information.

Figure 4 details the distribution of nitrogen fertilizer rates in the SW BMP region for corn following alfalfa; the corresponding corn yields are detailed in red.

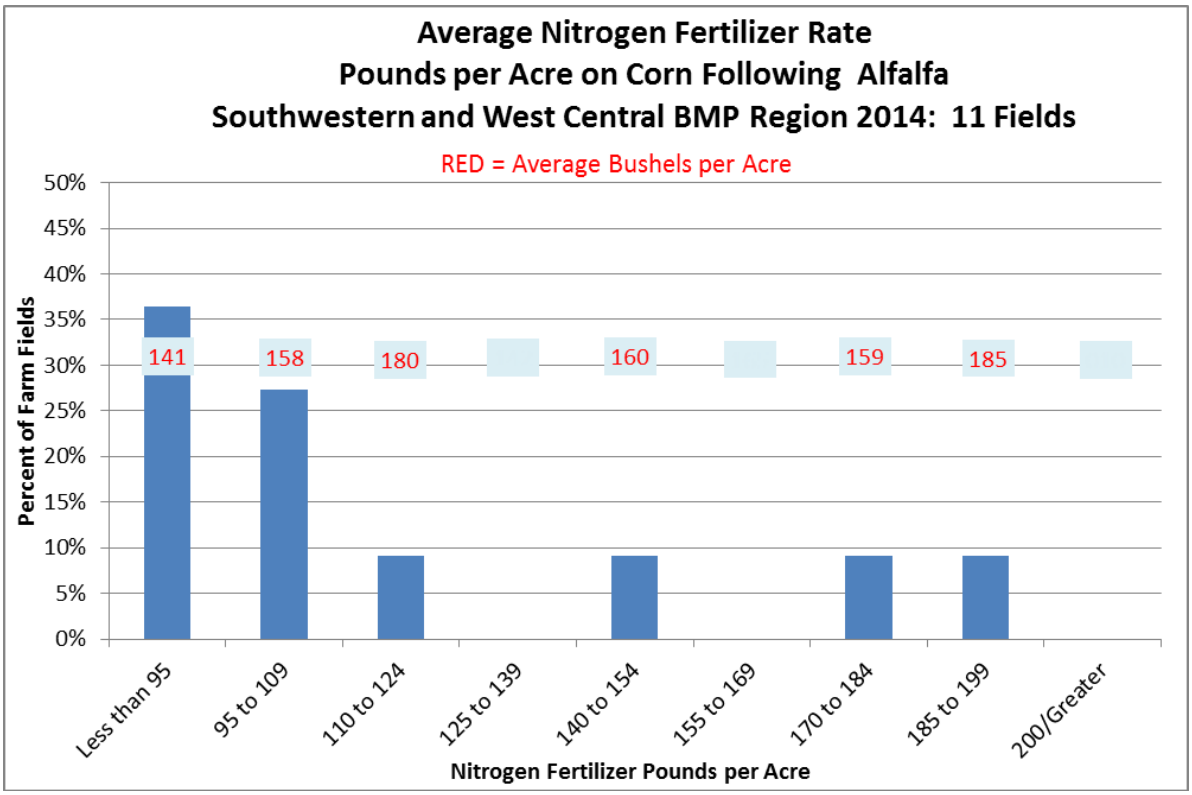


Figure 4. Average nitrogen fertilizer rates and yields on corn following alfalfa in the SW BMP region for 2014: 11 fields.

Less than five fields were included in the SW BMP Region for corn following alfalfa county analysis, therefor there is no discloser of information.

Manure section

Table 3 details the percentage of respondents on if the farmer knew the amount of nitrogen that is in the manure applied for the 2014 corn crop.

Table 3. The farmers' knowledge of nitrogen content of manure being applied for the 2014 corn crop.

BMP Region	Knowledge of the Actual Amount of Nitrogen Applied	Percentage of Respondents
Southwestern and West Central	Yes	37
Southwestern and West Central	No	63

§ Percent was calculated using only those respondents who answered yes or no to the question.

Table 4 details the nitrogen rates and corn yields in Southwestern and West Central BMP regions on corn following various crops. These are corn fields applied with manure and commercial nitrogen fertilizer.

Table 4. Average amount of nitrogen applied from manure and commercial nitrogen fertilizer and corresponding corn yields to previous crops by BMP region.

BMP Region	Previous Crop	Average Nitrogen Rate From Manure And Commercial Fertilizer Pounds per Acre	Average Corn Yield Bushels per Acre
Southwestern and West Central	Soybeans	177	182
Southwestern and West Central	Corn	178	182
Southwestern and West Central	Corn/Alfalfa	**	**
Southwestern and West Central	Other	**	**

Table 5 details the total amount of nitrogen applied to fields from both manure and commercial nitrogen.

Table 5. Average amount of nitrogen applied to fields from both commercial fertilizer and manure.

BMP Region	Main Source of Manure	Average Nitrogen Rate From Manure And Commercial Fertilizer Pounds per Acre
South Western and West Central	All	180
South Western and West Central	Dairy	159
South Western and West Central	Beef	198
South Western and West Central	Hog	179
South Western and West Central	Poultry	**
South Western and West Central	Other	**