



# Nutrient Management Plan Preparation with Small Groups of Farmers

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## Introduction

Minnesota livestock producers with more than 300 animal units are required to maintain a manure/nutrient management plan (MMP) by January, 2006. The MMP, like the USDA-NRCS nutrient management plan (NMP), specifies nutrient application rates for each field based on soil tests, manure tests, and yield goals, following University recommendations. It also specifies protective measures for manure application near water bodies and other sensitive features.

The **objective** of this project is to enhance crop and livestock producer understanding of crop nutrient planning and enable them to write their own plans or to better communicate with a plan writer. UM Extension is offering hands-on plan-writing workshops for small groups of producers throughout Minnesota over a three year period, following a model used previously in Iowa.

## Methods

- Two Extension Specialists (second and third authors) recruit local organizers, e.g. staff of County Feedlot Offices, Soil and Water Conservation Districts, livestock producer organizations, or local Extension Offices, to schedule workshops.
- The local organizers invite producers in groups of 10-15, and ensure that soil and manure test results and field maps for two fields of each producer farm are available at the workshops.
- A pre-workshop letter and questionnaire is sent to each producer.
- At the workshop, the Extension Specialist, assisted by local Extension or NRCS staff, present an overview of the planning process, then coach the producers through plan preparation for their two fields. A series of worksheets (see examples at right) assists in step by step determination of nutrient application rates. One of the worksheets assists producers in estimating fertilizer cost savings if the new plans are implemented.
- At the end of the three-hour session, producers fill out a second questionnaire addressing manure and nutrient application practices.
- A follow-up survey is sent to the participants after the next nutrient application season, to determine changes in practices.



## Example Worksheets for Plan Development

**Field Nutrient Management Plan** Crop Year 2005

Farm Name/Tract # Home Farm Tract 7H Field NE 40  
Field Location Dakota County, Hampton Township, Section 14 Acres 40  
Sensitive Features Intermittent stream, Open tile inlet, High soil P test level

Date Tested Oct 2004  
Original Matter 4.1% pH 6.6 Soil Name/Map Unit Corvix loam 1895B  
Soil Texture Loam

Planned Crop Corn Yield Goal 110 bushels  
Previous Crop Soybeans Quality/Yield 51 bu./ac

Other Nitrogen Credits  
Second-Year Legume Nitrogen Credit Crop Quality  
Second-Year Manure Nitrogen Credit  
Nitrogen Credit Based on Early-Spring Soil Nitrate Test

Net Nutrients Needed  
Planned Manure Applications (Plan to Manure Nitrogen Credit Worksheet)  
Manure Source Timing Method Rate/acre N P205 K2O  
Milking Herd Fall Broadcast 9,000 gal 90 108 218

Supplemental Nutrient Needs  
Planned Fertilizer Applications  
Manure Source Timing Method Rate/acre N P205 K2O  
UAN (28%) Spring Broadcast 12 gal 26 0 0

Total Nutrients to be Applied in Planning Year  
Sensitivity Area Management No manure application within 25 ft of streams within 300 ft of stream incorporate manure within 24 hours to reduce soil P buildup, apply manure at a frequency not to exceed 2 times during 6 years of the crop rotation; incorporate manure within 24 hours if within 300 ft of the open tile inlet.

**Manure Storage, Handling and Testing** Date Oct 04  
Producer name/operator Joe Farmer

Manure Source #1 Milking Herd Example Dairy Cows  
Animal #1 type Milk Cows  
Animal #1 number & size 250 hd @ 1,400 lbs 50 @ 1400 lbs  
Animal #2 type Dry Cows  
Animal #2 number & size 35 hd @ 1,400 lbs 7 @ 600 lbs

Manure Storage  
Storage type Earthen Storage Above ground tank  
Storage capacity (tons or gallons) 1,200,000 gal 500,000 gallons  
Storage length (days or months) 3 months 7 months

Application Methods  
Commercial hauler None No  
Spreader type Slurry tank Slurry tanker  
Spreader calibrated (date) April 2004 Yes, 11/03/2001  
When applied Fall and Spring  
Application method Broadcast Knife tines  
Incorporation timing? Broadcast Immediate

Annual Manure Production Generated (If manure is used, refer to Manure and Nutrient Generation Worksheet)  
Manure volume or tons per year 1,350,000 gal 450,000 gallons  
Manure volume based on records Yes  
Annual amount of N (lbs.) 42,750 lbs. N 24X450 = 10,800 lbs.  
Annual amount of P<sub>2</sub>O<sub>5</sub> (lbs.) 26,250 lbs. P<sub>2</sub>O<sub>5</sub> 18X450 = 8,100 lbs.  
Annual amount of K<sub>2</sub>O (lbs.) 47,250 lbs. K<sub>2</sub>O 28X450 = 12,600 lbs.

## Results

### 1. Workshops and Participants

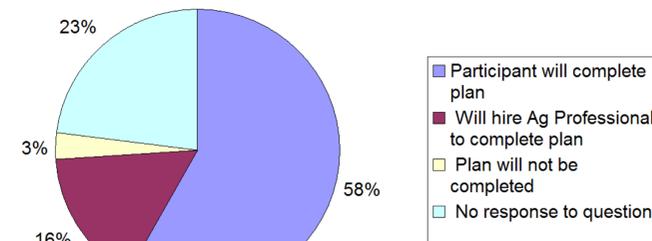
- 68 workshops have been held across the state.
- 710 producers and agricultural professionals have participated.
- 513,000 acres are managed by the farmer participants.

### 2. Savings in Fertilizer Cost\*

Estimated Fertilizer Savings \$ Per Acre	Percent of Participants
Less than \$1	3
\$1 to \$5	10
\$6 to \$10	30
\$11 to \$20	22
More than \$20	34

\* Calculated by participants during the workshop, based on following their new plans.

### 3. End-of-Workshop Stated Intent for Plan Completion for Entire Farm



### 4. Post-Season Survey: Practice Adoption\*

Practice	Response to question "Have you implemented this practice?" (Percent of respondents*)					
	Yes, before the workshop	Yes, only since the workshop	Will implement within 2 years	No plans to implement	Do not apply manure	No response
Follow UM nitrogen rate recommendations	58	21	10	4	0	7
Take soil tests at least every 4 years	82	10	3	2	0	3
Test manure	58	19	14	2	3	4
Calibrate manure spreader	45	21	19	4	8	3
Take full nutrient credit for manure	53	27	10	4	3	4
Rotate manure applications to avoid excessive P build-up	76	11	5	2	3	3
Keep field-based records of manure applications	40	31	17	4	3	5
Follow state guidelines for manure applications in environmentally sensitive areas	58	28	5	1	3	4

\* Survey response rate was 47% with 260 respondents.

## Summary

The "hands-on" preparation of nutrient management plans by farmers in small groups using data from their own farms was effective in increasing understanding of the planning process and in motivating them to adopt recommended manure and nutrient management practices. An in-workshop calculation of expected fertilizer cost savings assisted with motivation for plan implementation. A post-season survey indicated that 60% of responding participants had completed their plans as a result of the workshop. An additional 10% already had a plan or were in the process of plan completion.

### 5. Post-Season Survey: Actual Plan Completion\*

Response to question "As a result of the workshop, did you or your consultant complete or revise an NMP for all or most of your operation?"		
Response	Percent	
Yes		60
No		38
	Already had plan	6
	Plan in preparation**	4
	Plan not required for my operation	9
No Response		2

\* Survey response rate was 47% with 260 respondents.  
\*\* Counted from volunteered comments

## Partnerships and Funding

Local partners included County Feedlot Officers, Soil and Water Conservation District staff, local Extension staff, and staff of livestock producer organizations.

Core funding was provided through a Section 319 EPA grant awarded through the Minnesota Pollution Control Agency.

## Contact

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