

## 319 Project Title: Small-Group Preparation of Nutrient Management Plans

### Principal Personnel:

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- Les Everett, WRC Project Manager
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**Start Date:** January 30, 2003      **Completion Date:** June 30, 2006

**Project Goal:** To improve nutrient and manure management practices by: 1. directly increasing the number of crop nutrient and manure management plans written by farmers and agricultural professionals in Minnesota through a personalized education program, and 2. providing clear access to all necessary information for nutrient and manure management through development of a central web site. Our target was to directly assist 400 to 600 farmers in writing nutrient management plans in 40 small-group sessions.

**Work Plan Summary:** The University of Minnesota Extension Service partners worked with Soil and Water Conservation Districts (SWCD's), County Feedlot Officers, and livestock producer organizations to invite farmers to participate in workshops where they were assisted in writing a manure and crop nutrient management plan for two or more fields of their own farms. Prior to each workshop a worksheet was distributed to each participant to assist him or her to assemble information including soil test and manure test results, field maps, yield expectations, and other data that is required to develop a field-specific crop nutrient plan. In the workshop, the presenter gave an outline of the plan writing process, then walked the participants through development of complete plans for two of their fields. The plans were based on University of Minnesota recommended rates, timing, and method of nutrient application, and addressed management of sensitive features in or near fields, like coarse-textured soils, streams, and open tile intakes. Plans for the remaining fields of the farm were to be completed after the workshop by the farmer or by an agricultural professional engaged by the farmer. A survey of participants following the next crop growing season was mailed and followed up to determine rates of full plan completion, plan implementation and practices changed.

In addition to the workshops, a comprehensive crop nutrient and manure management web page for Minnesota was developed. The web page, [www.manure.umn.edu](http://www.manure.umn.edu), offers farmers and agricultural professionals "one-stop shopping" for manure and crop nutrient management information focusing on land application, and includes links to relevant agency and Extension web based information sources on other aspects of manure and nutrient management.

The program for education of producers, agency staff, and agricultural professionals was composed of six tasks:

Task 1: Materials Development

Task 2: Recruitment

Task 3: Workshop Preparation

Task 4: Workshop Delivery

Task 5: Post-Workshop Follow-up

Task 6: Develop Manure Management Web Site

## **TASKS COMPLETED**

### ***Task 1: Materials Development***

The following materials were prepared:

- Brochure for recruitment of local workshop organizers titled, “Organize a local workshop on manure & crop nutrient management”
- Brochure for recruitment of farmers titled, “Manure & crop nutrient management, a workshop for crop and livestock producers”
- Instructions for local workshop organizers titled, “Manure and crop nutrient management planning: Organizing a small-group workshop”
- Farmer enrollment form titled, “Manure and crop nutrient management workshop: Enrollment form for generating field maps”
- Pre-workshop livestock, manure, and soil-test inventory form
- Pre-workshop survey form
- PowerPoint presentation for the workshops
- Nutrient management plan worksheets (six)
- Post-workshop survey form
- Database for participant registration and summary of surveys and evaluations

### ***Task 2: Recruitment***

Recruitment of local organizers began with email invitations and distribution of the recruitment brochure, and continued with personal and email contacts with County Feedlot Officers, Extension staff, SWCD staff, and livestock producer groups.

### ***Tasks 3 and 4: Preparation and Delivery of Workshops***

Between February 2003 and March 2006, 80 workshops were held across the state with 843 participants, resulting in two-field nutrient management plans for all crop and livestock producer participants. Producers were about 92% of all participants, managing approximately 608,800 crop acres.

### ***Task 5: Post Workshop Followup***

Practice adoption information was collected from pre-workshop surveys given to participants prior to the training and from workshop evaluations completed at the end of each session. In addition, a survey of first and second-year participants was mailed out and followed up after the first growing season when the new nutrient management plans would have been employed. See the section below on “Findings and Results”.

### ***Task 6: Web Site Development***

The Manure Management web site was completed and approved by MPCA staff. It is a dynamic site maintained by the staff of the Department of Biosystems and Agricultural Engineering at the University of Minnesota, and is updated as necessary. It can be viewed at <http://www.manure.umn.edu> .

## FINDINGS AND RESULTS

Practice adoption and other information was collected from participants with pre-workshop and end-of-workshop questionnaires. A summary of the questionnaires indicated:

- At the end of the workshop participants were more likely to adopt seven specific manure-related Best Management Practices (BMPs) than prior to the workshop. The four most significant practice changes are shown in Table 1.
- Efficient use of manure can decrease the quantity and resulting cost of purchased fertilizer needed for crop production and reduce loss of nutrients to surface and groundwater. In the workshop, participants completed a worksheet that calculates potential fertilizer cost savings for their farms. Eighty-six percent calculated that they would save fertilizer expenses of \$6 or more per acre using manure application rates based on the plan they developed (Table 2). **In the higher fertilizer price environment of 2006 and beyond, these savings would be considerably higher.**
- During the three-hour workshop a nutrient management plan was completed for two or more of the participant's farm fields. The participant's intent regarding plan completion for the remaining fields of their farm operation is shown in Table 3. Of those responding to the question, 75% indicated they would complete the plan for the whole farm themselves, 21% would hire a consultant to finish the plan for the whole farm, and 4% would not complete the plan. (Twenty-three percent of the participants did not answer this question.)

**Table 1. Pre-workshop actual and post-workshop intended adoption of key manure management practices.**

Practice	Actual and Intended Practice Implementation	
	Pre-Workshop Actual	Post Workshop Intended
Test manure	60%	94%
Calibrate manure application equipment	60%	82%
Take full nutrient credit for manure	44%	88%
Keep manure application records	58%	75%

**Table 2. Fertilizer cost savings when fully utilizing manure according to the plan.**

Projected Fertilizer Cost Savings (\$ per acre)	Percent of Responses
Less than \$1	3%
\$1 to \$5	11%
\$6 to \$10	30%
\$11 to \$20	23%
More than \$20	33%

**Table 3. Participant intent for plan completion.**

Question	% Responded
Participant will complete the plan themselves	58%
Participant will hire an Ag Professional to complete the plan	16%
Will not complete the plan	3%
No response to the question	23%

## Post-Season Survey Results

A survey of 699 participants was mailed and followed up after the first growing season when the new nutrient management plans would have been employed. There were 351 total respondents, yielding a 50% survey return rate answering some or all of the questions. Of respondents, 92% were producers, managing an average of 785 acres. Table 4 below presents results of responses regarding practice implementation.

**Table 4. Post-season survey responses regarding practice implementation.**

Practice	Response to question “Have you implemented this practice?” (%)*					
	Yes, before the workshop	Yes, since the workshop	Will implement within two years	No plans to implement	Do not apply manure	No response
Follow UM nitrogen rate recommendations	54	22	11	5	0	8
Take soil tests at least every 4 years	81	10	3	1	0	5
Test manure	55	21	14	2	2	5
Calibrate manure spreader	43	22	20	4	6	5
Take full nutrient credit for manure	49	29	10	3	2	6
Rotate manure applications to avoid excessive P build-up	76	11	5	1	2	4
Keep field-based records of manure applications	37	33	17	4	3	6
Follow state guidelines for manure applications in environmentally sensitive areas	58	29	5	1	3	4

\*343 respondents

Table 5 presents participant response to the question “As a result of the workshop, did you or your consultant complete or revise a Nutrient Management Plan for all or most of your operation?” Approximately 64% indicated that they had completed their plans, previously had a plan, or were in the process of plan completion.

**Table 5. Percent plan completion.**

Response*		Percent	
Yes			55
No			45
	Already had plan**	6	
	Plan in preparation**	3	
	Plan not required for my operation	11	

\*297 responses to the question.

\*\*Counted from volunteered comments

## **Funding**

The project 319 funding of \$263,040 was supplemented for one year (beginning July 2003) by a \$30,000 grant from the Minnesota Department of Agriculture, allowing for, among other activities, the addition of 14 workshops and eventual extension of the project to June, 2006. The original proposal target was 40 workshops, while the number attained was 80. The proposal target was 400-600 participants, while the actual number attained was 843. All funds were expended by June, 2006. All required match by UM Extension and the Water Resources Center staff was documented, and additional undocumented effort was provided by County Feedlot Officers, Soil and Water Conservation District staff, and staff of livestock producer organizations.

## **Lessons Learned**

Hands-on development of nutrient management plans in a small-group, highly coached setting is an effective method of getting plans completed and implemented. It facilitates understanding of the planning process and supporting practices. Use of the producer's own farm and field information provided motivation in the workshop and ownership of the plan after the workshop.

The small-group format allowed us to capture information on prior practices and changes since we had a close interaction with participants. General surveys without this relationship are less well received.

The exercise of estimating fertilizer cost savings from plan implementation was an effective tool in motivating plan implementation.

Participation was strongly enhanced by the requirement in the Minnesota Feedlot Rules, revised in year 2000, that required all livestock producers with more than 300 animal units, to have on the farm a nutrient management plan. Over 90% of participants were livestock producers, and more than half managed operations in the 300-1000 animal unit range. This is an example of regulations and education together being more effective than either alone.

The project provided \$40 per participant to the local organizer offices (primarily CFOs and SWCDs) for their effort in recruiting the participants and ensuring that farm and field information for each participant's farm was available for the nutrient management plan preparation during the workshop. Payment was by invoice following each workshop. This ensured a commitment on the part of local organizers to success of the workshop.

One Extension specialist position was paid for and dedicated to the project for recruiting and communicating with local organizers, presenting many of the workshops, and following up with surveys. This was key to successful completion of both the workshops and evaluation. Other Extension and NRCS specialists also assisted in workshop delivery.

## **Results of this project were presented in the following venues:**

- Poster, Small-group nutrient management planning in Minnesota. 2004. K.M. Blanchet, J.M. DeJong-Hughes, L.A. Everett, Abstracts, Annual Meetings of the American Society of Agronomy
- Oral Presentation, Small-group nutrient management planning in Minnesota. 2005. Minnesota Water Conference (Kevin Blanchet, Jodi DeJong-Hughes, Les Everett)
- Poster, Nutrient management plan preparation with small groups of farmers. 2006. Leslie Everett, Kevin Blanchet, Jodi DeJong-Hughes, USDA-CSREES National Water Quality Conference
- Poster, Outcomes from Extension-led farmer preparation of nutrient management plans. 2006. K.M. Blanchet, J.M. DeJong-Hughes, L.A. Everett Abstracts, Annual Meetings of the American Society of Agronomy
- Cover article of the April 8, 2005 issue of Successful Farming magazine.