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A Statewide Educational Program to Implement Comprehensive Nutrient Management Planning

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A Statewide Educational Program to Implement Comprehensive Nutrient Management Planning

NON-TECHNICAL SUMMARY: EPA and USDA NRSC have stated that the most effective way for animal feeding operations (AFO's) to minimize water quality and public health risks is to develop and implement comprehensive nutrient management plans. In response a proposed CNMP workbook has been designed to serve as an animal operation's environmental operating plan. This project will initiate field testing of the proposed Nebraska CNMP with livestock producers and advisors. It will also assist with development of supporting resources and training for educational and technical advisors.

OBJECTIVES: Objective 1. Develop a Draft Comprehensive Nutrient Management Plan (CNMP) with consensus among public and private sector stakeholders. Objective 2. Pilot test the Draft CNMP tool with livestock producers and technical advisors in three Natural Resource Districts (NRDs). Objective 3. Implement a statewide educational program to develop the infrastructure required for Final CNMP delivery to animal feeding operations (AFO's) in Nebraska.

APPROACH: For Objective 1: The project will complete development of a Draft CNMP. This tool is designed to provide a framework for planning process acceptable to public and private sector stakeholders. The proposed project will: 1. Publish a Draft CNMP workbook for producers and advisors. 2. Prepare supporting CNMP educational program. Planned supporting resources include a) a user's implementation guide; b) an educational program including Power Point presentations, case study problems, and educator resource manual. The national Livestock and Poultry Stewardship curriculum resources will be adapted to provide the foundation for the proposed CNMP educational program. 3. Facilitate development of CNMP compatible testing laboratory reports. A discussion among laboratories providing manure and soil analysis will identify formats for presenting information compatible with the CNMP. This discussion will include a review of opportunities to combine soil and manure analysis reports to allow laboratory recommendations for manure application rates. For Objective 2: The pilot implementation component will provide a field-tested CNMP product that meets the needs of the livestock and poultry community. The pilot project will test functionality, acceptance of the tool among livestock producers and their advisors, and associated implementation costs. This project team will: 1. Pilot test the Draft CNMP tool through a supporting educational and technical assistance program with 60 producers in three NRDs (Upper Elkhorn, Lower Elkhorn and Lower Platte North). Educational programs for both producers and technical advisors will be implemented and evaluated. In addition, a one-on-one technical assistance program will: a) Introduce participating livestock producers to an on-farm manure nutrient assessment that will include Farm-A-Syst style risk assessment, manure sampling, calibration of application equipment, and follow-up reports of environmental strengths and weaknesses of current practices, manure nutrient availability and future nutrient credit recommendations; b) Establish a database defining the average manure nutrient concentration of manure and effluents for different manure management systems; c) Collaborate with local agencies and programs (EQIP, Conservation Reserve Program, Nebraska Buffer Initiative, etc.) as appropriate for implementation of the pilot efforts. 2. Pilot test an educational program for technical consultants. A classroom educational program will be assembled for this purpose and piloted with 10 technical consultants. 3. Track implementation of the Draft CNMP among 12 AFOs and 4 technical advisors for the duration of this project to identify issues associated with extended implementation of a CNMP. This evaluation will provide feedback on effectiveness and user-friendliness of individual tools, ability of producer to implement appropriate nutrient management plans, and the costs associated with implementation of CNMPs. For Objective 3: The project will fund completion of a field-tested Final CNMP tool and supporting educational resources for printing and distribution to Nebraska livestock producers.

PROGRESS: 2000/09 TO 2004/09

Project Team A project team of 15 University of Nebraska extension educators and faculty are responsible for development and implementation an educational program targeting management of nutrients on livestock and poultry operators. The program has supported implementation of the Nebraska regulations and the recently revised EPA CAFO regulations. This report summarized some of the accomplishments of this team led by Charles Shapiro, Charles Wortmann, and Rick Koelsch. Workshop Participation In-depth educational programs were developed, pilot tested, an implemented for livestock producers, technical service

provider. All programs provided a minimum of 6 hours instruction with some involving up to 9 hours of instruction. Participation over past four years has included 545 participants in producer targeted programs, 140 in technical service provider programs, and 15 in environmental agency targeted programs. Products Developed Planning and Decision Aide Software Tools 1. Whole Farm Nutrient Balance Spreadsheet: This measuring tool identifies livestock and poultry operations that accumulate or concentrate excess nutrients and evaluates the environmental benefit of alternative nutrient strategies. 2. Nutrient Inventory Spreadsheet: This file estimates for an animal feeding operation 1) the amount of N, P, and K excreted by animals, 2) the quantity of available nutrients after storage and land application losses, and 3) the land requirement for utilizing remaining nutrients at an agronomic rate. 3. Manure Use Plan Spreadsheet: The Manure Utilization Planner assists a producer in estimating the nutrient credit for manure, fertilizer, legumes, and irrigation water and balancing those credits against the nutrient requirements of a crop for individual fields. The Planner also provides a summary Action Plan for all fields recommended manure and fertilizer application rates selected by the producer. 4. Nebraska Manure Value Calculator: This tool simplifies the calculation of manure value. The value of other benefits of using manure can be estimated, such as an expected yield increase. Other Resources 1. CNMP Workbooks: Three workbooks designed to assist a producer in the development and implementation of a CNMP focused on the issues of land application, manure storage, and odor management. 2. Manure Sampling & Calibration Kits: 15 Manure Sampling and Calibration kits were assembled and distributed to regional sites. These kits are to be loaned to producers and contain tools, sampling supplies, and records to assist a producer in collecting a manure sample, in-field testing of manure characteristics for land application, and calibrating application equipment. Additional information and photos of kit can be found at <http://cnmp.unl.edu/calibrationkits.html> NPD funds have partially funded these kits. The kits are located as shown in the map to the right. 3. CNMP Web Site: All resources described previously and others are accessible at no cost through the NE CNMP Web Site. A review of web site use indicates that 25,020 individual contacts with the home page of the UNL CNMP web site from November 2003 to October 2004.

IMPACT: 2000/09 TO 2004/09

Following completion of the class, producers indicated that they have the following skills. Ability to prepare a CNMP permit application: Yes 36%; Yes, with some help 58%; Unsure 5%. Ability to estimate total land required for manure: Yes 71%; Yes, with some help 25%; Unsure 4%. Ability to develop a nutrient mgmt. activities plan: Yes 65%; Yes, with some help 33%; Unsure 2%. Ability to calculate nitrogen credit for manure: Yes 69%; Yes, with some help 25%; Unsure 5%. Write an annual manure use plan: Yes 56%; Yes, with some help 38%; Unsure 5%. Ability to identify key records for maintaining a permit: Yes 58%; Yes, with some help 36%; Unsure 5%. Written comments include: "Excellent hands on opportunity", "Instructions on each page provide an excellent review of info in class", "I think this program is what we have been looking for", and "I felt this series covered all my questions...I believe it covered all my concerns as a pork producer". Several mentioned that they would have liked more time on the computers, but some also said they just need to try the software out at home to get more familiar with it. Producer participants in educational programs manage 1,770,000

beef cattle (75% of NE industry one-time capacity), 1,310,000 swine (45%), 130,000 nursery pigs, 16,300 dairy cattle (25%), 5,600 dairy heifers, and 260,000 turkeys. As a result of this effort, producer participants indicated that they plan to initiate calibration of application equipment (57%), sample manure (47%), and initiate a record keeping effort (57%).

PUBLICATIONS (not previously reported): 2000/09 TO 2004/09

1. Wortmann, C.S., R.K. Koelsch, C.A. Shapiro, R.L. DeLoughery, D. Tarkalson, 2004. Manure Use Planning: an Evaluation of a Producer Training Program. J. Extension (in review).
2. C. Shapiro, R. DeLoughery, R. Koelsch, M. Kucera, C. Wortman. 2003. Use of Computer Spreadsheets and Paper-Based Workbooks to teach Comprehensive Nutrient Management planning. Proceedings of the 9th International Symposium on Animal, Agricultural, and Food Processing Wastes. American Society of Agricultural Engineers. Pages 432-438.
3. R. Koelsch, C. Shapiro, R. DeLoughery. 2003. Nebraskas CNMP. University of Nebraska Cooperative Extension: Manure Application Workbook. EC02-720. 90 pages. Manure Storage Management Workbook. EC02-722. 65 pages. Odor Management Plan Workbook. EC02-721. 28 pages.

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