Nutrient Management Training Provided by USDA NRCS

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ABSTRACT

The USDA Natural Resources Conservation Service has implemented nutrient management planning via our conservation practice standard Nutrient Management (590). To prepare our field office staffs to guide landowners through the nutrient management planning process, we have developed a training course that delivers the technology, planning guidelines and environmental assessment tools they will require. While this course emphasizes the technical basis of nutrient management, it also presents the field methods for environmental assessment and conservation planning that are necessary to complete the nutrient management plan. This training is delivered in three phases: 1) a self-study text and workbook, requiring approximately 30 hours to complete. Participants must successfully complete a test over this material; 2) participating in a 20-hour facilitated discussion group. This locally-led session is designed to focus on local issues as they relate to nutrient management planning; 3) students return to their work location and develop a nutrient management plan. The plan will be reviewed for completeness and accuracy by the instructors of the facilitated session.

The course material is available to anyone, inside or outside NRCS, who wishes to develop nutrient management plans. Registration and testing may be done on-line at http://www.nedc.nrcs.usda.gov/enrollment.htm. Continuing education units are available to those who successfully complete the course.

KEYWORDS. Nutrients, Nutrient management, Management practices, Conservation planning

INTRODUCTION

The primary role of the USDA, Natural Resources Conservation Service (NRCS) is to provide technical assistance to private landowners to help them maintain or improve the quality of the resources (soil, water, air, plants and animals) that they manage. We do this through the conservation planning process, during which we: a) inventory and analyze the resources, and determine the extent of resource degradation, if any; b) develop alternative methods for properly treating these resources that meet the landowner's objectives for their operation; and c) provide technical assistance to landowners as they apply the practices needed to protect their resources. The goal of the conservation planning process is to develop and apply a system of conservation practices and management techniques that maintain or improve the quality of the natural resources.

Nutrient management is becoming an increasingly important tool to maintain or improve surface and groundwater quality. The mission of NRCS calls for integration of nutrient management into the conservation planning process. Planners must understand the cause and effect relationships of nutrient management in order to better support partnerships with state agencies, Extension, crop consultants, private industry, and the farmer. This is especially important as producers with livestock begin the process of developing Comprehensive Nutrient Management Plans (CNMP). Planners must be familiar with the basic scientific processes important to

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nutrient management, as well as important ecological interactions as they relate to offsite environmental concerns. With this increased knowledge, planners will be better able to incorporate important environmental considerations into nutrient management planning, especially in environmentally sensitive areas.

**NUTRIENT MANAGEMENT PLANNING**

NRCS defines nutrient management as "managing the amount, source, placement, form and timing of the application of nutrients and soil amendments". Nutrient management is planned and applied to:

- Budget and supply nutrients for plant production.
- Properly utilize manure or organic by-products as a plant nutrient source.
- Minimize agricultural nonpoint source pollution of surface and ground water resources.
- Maintain or improve the physical, chemical and biological condition of soil.

A nutrient management plan is a record of how the producer or landowner plans to use nutrients for food, fiber and forage production. To properly document the nutrient management planning process, a nutrient management plan should include, as a minimum, the following information:

- Aerial photograph or map and a soil map of the site.
- Location of designated sensitive areas or resources and the associated nutrient management restriction.
- Current and/or planned plant production sequence or crop rotation.
- Results of soil, plant, water, manure or organic by-product sample analyses.
- Realistic yield goals for the crops in the rotation.
- Quantification of all nutrient sources.
- Complete nutrient budget for nitrogen, phosphorus, and potassium for the rotation or crop sequence.
- Recommended nutrient rates, timing, form, and method of application and incorporation.
- Guidance for implementation, operation, and maintenance.

Nutrient management cannot be done in a vacuum. A nutrient management plan, although prepared for all fields on a farm or operating unit, is only one component of the complete conservation plan, or resource management system (RMS) for that farm. Nutrient management must be integrated with other components of the RMS, which may include erosion control, soil quality improvement or livestock production.

**NUTRIENT MANAGEMENT TRAINING**

To help prepare our employees, and others, to better handle the task of nutrient management planning, NRCS has developed a training course titled "Nutrient and Pest Management Considerations in Conservation Planning". Pest management is included because many of the physical and chemical processes involved are common to both nutrient management and pest management. Students can register for either the nutrient management track or the pest management track. This paper details only the nutrient management track of this course.

After completion of the course, participants will be able to:

- Describe NRCS' role in nutrient management, and the policies, rules and regulations that guide the development of the nutrient management component of a resource management system (RMS) plan.
Define environmental risk, list concerns associated with environmental risk, and describe the processes that affect the fate and transport of nutrients in the environment.

Describe the important chemical, biological and physical processes underlying the science of nutrient management.

Explain the importance of weather information and incorporate the factors of climate and water management into a nutrient management plan.

Identify major natural resource concerns, planning considerations and potential conservation practices which should be included in a resource management system, and the level of nutrient management necessary for adequate resource protection.

Describe the practical aspects of nutrient management planning and implementation.

Develop a nutrient management component of a resource management system plan.

The course is designed for NRCS field office conservationists and technical specialists, private consultants and industry representatives who currently are or soon will be involved in nutrient management planning.

Delivery Strategy

The course consists of three parts:

- Part I - self-paced study of Modules 1 through 6.
- Part II - participation in a facilitated group training session.
- Part III - completion of a nutrient management component of a conservation plan.

Upon registration, the student can take a pre-test over the material in Modules 1-6. If they score 80% or better on this test, they do not have to complete Part I. They will receive a letter confirming their proficiency in this material, and are then ready to complete Parts II and III.

Figure 1 is a schematic representation of the course structure and how a student might progress through the course.

![Course Structure Diagram](image-url)

Figure 1. Schematic of course structure and student progress through course.
Course Content

Modules 1 through 6 are designed as self-study material, to be completed at the student's own pace. These modules contain text, tables and figures that present the material, and student exercises that review and reinforce the material. These modules cover:

- NRCS' role in nutrient management, and our nutrient management policy.
- fate and transport of nutrients in the environment and the environmental concerns associated with nutrients.
- environmental risk assessment.
- the chemical, biological and physical process underlying the science of nutrient management.
- the role of climate in nutrient management.
- the importance of water management as it relates to nutrient management.
- the NRCS conservation planning process
- the major resource concerns that must be addressed in nutrient management planning.
- planning and applying nutrient management

Part I should take about 20-30 hours to complete. Twelve continuing education units (CEUs) will be awarded for the successful completion of Part I.

After successfully completing Part I, the student attends a facilitated group discussion session that is held in the participants home state, which is Part II of the course. This session covers Module 7, which presents a case study situation. Using this case study farm, participants work through several exercises and discussion sessions that show how to develop the information needed for a nutrient management component of a conservation plan, and that help them better understand the nutrient management planning process. The case study farm may be a hypothetical situation developed by the facilitators, or it may be an actual farm that the students will visit and collect the information they need to develop the nutrient management plan. Active participation in the discussion and group exercises is essential to successfully completing this part. This Part should take approximately 16-20 hours to complete. Eight CEUs will be awarded for the successful completion of Part II.

Part III is the most important part of the course. For this Part, students return to their work location and develop a nutrient management plan for a client or customer. The plan is reviewed by the instructor of the facilitated session for accuracy and completeness. This Part is the equivalent to the final exam for the course, because it will demonstrate whether or not the participant learned and understood everything that was presented in Parts I and II. Part III should take about 16-20 hours to complete. Five CEUs will be awarded for the successful completion of Part III.

Registration and Testing

Registration for this course is open to anyone who wants to improve their nutrient management skills, whether or not they are NRCS employees. Those who want to register for this course should go to http://www.nede-nrcs.usda.gov/enrollment.htm. The course, "Nutrient and Pest Management Considerations in Conservation Planning", is listed under Enrollment in Web Supported Training. The registration procedure is slightly different for Federal vs. non-Federal enrollees, but the test and course material are identical for everyone taking the course.

Immediately after registration, the student has the opportunity to take a pre-test over the course material. The test is given on-line, and the score is tallied immediately after completing the test. A score of 80% or higher indicates the student is proficient in this material, and they do not have to take Modules 1-6. If a student scores lower than 80% on the pre-test, they will be sent the course materials for Modules 1-6. There are two post-tests to complete, one over the material in
CONCLUSION

The Natural Resources Conservation Service has a responsibility to deliver the latest technology in natural resource management to our clients. Nutrient management is a critical tool for maintaining or improving not only water quality, but also soil quality and our ability to produce adequate supplies of food, fiber and forage. NRCS has traditionally relied on Extension and crop consultants to provide nutrient recommendations to land users. These recommendations addressed the soil fertility and crop production aspects of nutrient management very well, but not the natural resource concerns associated with nutrient use. Our current nutrient management policy emphasizes that our primary role is to provide information on the environmental risks of nutrient use and management to our clients. We will continue to use Extension or Land Grant University nutrient recommendations based on efficacy, but with those we will couple our recommendations for appropriate mitigation strategies that are designed to protect the resource base.

NRCS does not have the resources to meet the current demand for nutrient management planning assistance. The shortfall of resources will only get worse when Comprehensive Nutrient Management Plans are required for larger livestock operations. It will take more time to prepare a CNMP because of the size and complexity of these operations. We see this course as a means of increasing the number of people who are qualified to plan and apply nutrient management systems. Only by working closely with all our partners, Extension, crop consultants, and private industry, can we hope to provide farmers with the technology and assistance they need to properly manage their resources.