

Project Overview

Intern: Jake Marotz

Major: Ag Engineering

School: University of Nebraska-Lincoln



Project Description

Pollution Prevention intern Jake Marotz' summer 2006 assignment was to the Small Business/Agricultural Assistance Team. His projects included reassessments of ten Whole Farm Nutrient Balances (WFNB) clients from previous years, a reassessment of one small business, and working closely with University of Nebraska-Lincoln (UNL) Extension Engineer Chris Henry and Engineering Technician Jason Gross to develop alternative waste management systems for small-to-medium livestock producers. Tasks included reassessing businesses visited by past interns, investigating new P2 opportunities, interviewing farmers statewide, visiting with prospective alternative waste treatment systems candidates, surveying land for waste treatment systems, and drafting waste treatment systems.

Nutrient Balance Reassessments

Over the past two years, Partners in Pollution Prevention (P3) program interns have provided nutrient assessments and WFNB for 16 different livestock producers throughout Nebraska. The idea of a WFNB is a relatively new concept in the realm of pollution prevention (P2). Livestock feed and manure is a very good source of organic nitrogen (N) and phosphorus (P). Because of this, it is used by producers as crop fertilizer. Unfortunately many producers do not realize the potency of manure, and nutrient overloading often occurs, resulting in risks for high P runoff and N groundwater leaching. The WFNB is a way to educate producers about how to limit nutrient loading.

The P3 program and UNL Extension believe it is important to reassess the impact of past technical assistance in order to determine the value of the assistance provided. A survey was developed to determine the impact that the WFNB work had for these producers and their operations. A letter was sent out to each operation informing them that the survey was being conducted, and then the operations were called and survey interviews were administered. Sixteen livestock producer operations were eligible for the survey; 10 participated. Of these 10, four (40%) reported that their awareness of nutrient management increased as a result of the WFNB, and four (40%) made a change in their operations after the WFNB. This coincides with P3 program data which indicates that 33% of small businesses have made changes as a result of past intern suggestions. It appears that the WFNB has had a positive impact on livestock and crop producers. All of the producers reported that annual soil tests for N and P are performed on all their fields.

Small Business Reassessment

Reassessments of small businesses are a way to determine whether previous interns' recommendations were implemented, and to determine whether there may be additional P2 opportunities to consider. A reassessment was conducted for one small agricultural business that had received P2 assistance in 2005. Their current practices were assessed

and additional suggestions/new P2 opportunities were identified. Of the seven recommendations made in the original assessment, Jones has implemented one and is still in the process of investigating three others for implementation. In addition, they have implemented three additional self-identified pollution prevention steps. The savings from these steps is summarized in Table 1 below.

Table 1: Summary of Savings from P2 Opportunities Implemented/Investigated

| | Money Saved Annually | KWH Saved Annually | Gallons Oil Waste Diverted Annually | Pounds of Waste Diverted from Landfill Annually |
|----------------------|----------------------|--------------------|-------------------------------------|---|
| All P2 Opportunities | \$108 | 1520 | 325 | 84,455 |

Alternative Waste Management Systems

Many small-to-medium livestock producers (fewer than 1000 animal units) are finding it difficult to adjust to the changes that are being made in the regulatory realm of waste management. The size of these operations makes conventional waste systems costly and impractical. Alternatives are being developed that are allowing these producers to remain in operation at their current capacity by using a more cost efficient and practical means of waste management. These alternative waste management systems utilize old conservation practices in a new and innovative way. Structures such as diversion basins, terraces, vegetative wetlands, and hay meadows are used to treat the runoff while at the same time producing a quality hay crop. By utilizing these structures, a form of a Vegetative Treatment System (VTS) can be constructed to allow the nutrients contained in the runoff to be recycled back into a crop that can be used for feed in the operation. Through a cost comparison of VTS's and Conventional Holding Pond systems is was discovered that the VTS is approximately half the construction cost of a holding pond. VTS's also do not take any land out of crop production, they only designate an area to hay production. Another benefit is that no permits are required for the VTS which allows for flexibility in construction.