Executive Summary

Integrated Tillage and Manure Management Demonstration Project – Hub and Spokes
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Tillage, nutrient, and manure management have a significant impact on surface and ground water quality, especially surface water runoff. A tillage survey sponsored by the Iowa Resource Management Partnership (IRMP) committee in 1999 (IRMP, 2000), indicated the need for improvement in adopting conservation practices. An integrated approach in development and adoption of best management practices for manure, nutrient, tillage and crop residue is essential. Practitioner involvement, throughout the process of planning and implementing educational programs, enhances adoption of recommended practices. The major goal of this project is to demonstrate tillage and manure best management strategies on large field-scale demonstrations. The strategy for this project is to conduct on-farm demonstrations in several counties in northeast Iowa in cooperation with the Northeast Iowa Agricultural Experimental Association (NEIAEA). A “Hub and Spoke” participatory education model will be used as a foundation for education and outreach programming.

At the Northeast Research Farm (Hub), evaluations of liquid swine manure and commercial fertilizer have been established over three tillage systems consisting of no-tillage, conventional tillage, and fall strip-tillage. Manure and commercial nitrogen fertilizer rates (0, 75, 150, and 225 lbs N/acre) were applied over each tillage system. The tillage and nitrogen rates were replicated three times. Thirteen cooperators established fourteen on-farm demonstration sites (Spokes) to evaluate the effects of liquid swine manure rates on corn production and soil nutrient analysis. For each demonstration site manure applicators were calibrated to determine or check the application rates. Four rates of manure (0, ½ agronomic, full agronomic, and 1½ times the agronomic nitrogen rate pounds per acre) were applied at each demonstration site in three replications.

The results from both the on-farm demonstrations and the research farm show similar trends. Initial soil and manure analyses show significant variability within each site and between all sites. Late spring soil nitrate and fall stalk nitrate tests show a high dependence on manure management and application rates. Yield response to additional nitrogen and nitrogen source was affected by the site-specific history.

The outcome of this approach is very encouraging, over 911 producers and agriculture professionals participated in the educational programs of five field days, CCA training, Crop Diagnostic Clinics, Soil Management Clinic, and several local, regional, and national conferences during 2004.

By addressing tillage and manure management using an integrated approach, nitrogen utilization can be more efficient. An integrated approach that utilizes large scale field demonstrations and research size plots is essential in addressing manure and tillage management challenges. The ability to obtain results from on-farm trials and research plots that are consistent, will enable us to couple both concepts together to provide quality educational programs to producers and the agribusiness industry.