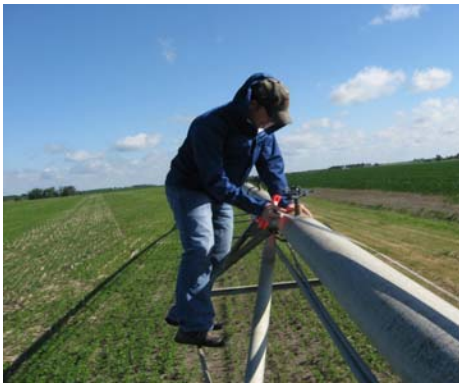
Project Overview



Intern: Eric Bolton
Major: Mechanized Systems Management
School: University of Nebraska at Lincoln

Project Description:
The summer's projects included:

- Identifying inefficiencies within agricultural producers current irrigation systems through system assessments.
- Making engineered recommendations to provide a more efficient option of replacement.
- Providing a cost analysis of recommended options, as a decision tool for producers.
- Aiding in the activities of the Clay County Extension office.

Utilizing existing relationships between extension educators and producers interested in improving efficiency, a report was composed for each producer detailing the producer's current practices and offering suggestions for further improvement. Reports are composed of analyses of the fields each producer agreed to, with suggestions and accompanying calculations for individual fields. Each irrigation system was broken into its main parts (i.e. pump, engine, sprinkler system) and suggestions were tailored to each component, with the goal of optimizing the system for maximum efficiency under the given conditions.

Pollution Prevention Benefits & Results

Direct impacts include water use reduction, energy reduction, and fuel reduction. These are summarized in Table 1 below. Other benefits include yield increase, and reduced surface water runoff. Additionally, the reports serve as a collection of data for the entire irrigation system, and can provide a benchmark for additional improvements, maintenance, and component replacement. Hopefully the reports will induce further investigation by producers into efficiency improvements, and create an improved appreciation for the importance of improvements and the relationship to pollution prevention.

Table 1: Potential Pollution Prevention Results

Focus Area	Annual Water Savings: gal/yr	Annual Diesel Savings: gal/yr	Annual $$ Savings	Annual Greenhouse Gas Reduction (CO_2 equivalent)
Engine Upgrades		250	$800	2 Metric Tons
Watermark sensors	108,000,000	26.400	$87,000	269 Metric Tons
Total	**108,000,000**	**26,650**	**$87,800**	**271 Metric Tons**