

Project Overview

Intern: Jordan Wachal

Major: Civil Engineering

School: University of Nebraska-Lincoln



Company Background

University of Nebraska-Lincoln extension offices provide assistance with a wide array of topics from animal agriculture and horticulture to entrepreneurship and youth education. Extension educators form a link between the state's researchers and those implementing the new technology or practices. Extension offices strive to make a local, relevant impact by responding to the needs expressed by each local community.

Project Description

Utilizing existing relationships between extension educators in Fillmore County, NE and producers interested in improving efficiency, the intern research opportunities and composed a report for each producer, detailing current practices and offering suggestions for further improvement. Work included an analyses of two fields per producer. Each 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 potential impacts include water use reduction, energy and fuel reduction and reduction in Greenhouse gas emissions. Other benefits include yield increase, and reduced surface water runoff. Additionally, each report produced serves 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 resource conservation. Results of the projects are summarized in Table 1 below.

Table 1: Potential Pollution Prevention Results

Focus Area	Annual Savings	Annual Greenhouse Gas Reduction (CO ₂ equivalent/yr)	Water Reduction (MG/year)	Annual Energy Reduction
Engine/Pump Upgrades	\$16,000	68 Metric Tons	0 MG	
Watermark sensors	\$16,000	95 Metric Tons	88 MG	
Total	\$32,000/year	163 Metric Tons/year	88 MG/year	13,500 kWh 2190 gal diesel 7040 gal propane 17,550 therms CNG