

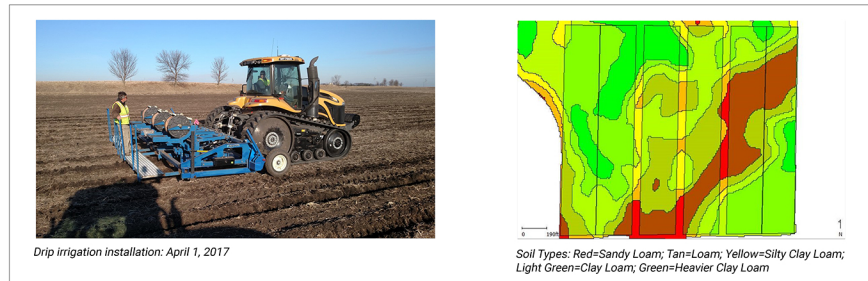
INNOVATION GRANT



Drip Irrigation and Nitrogen Management

COLLABORATORS

- Brian Velde, Farmer
 - Bruce Potter – UMN Extension
 - Jeff Strock – UMN Department of Soil, Water and Climate
 - Ken Franzky – Central Crop Consulting Agronomy Manager
 - Kurt Grimm - Nutradrip



SYNOPSIS

- The demonstration site is in a corn soybean rotation with conventional tillage. The field is well drained and has been grid sampled for fertility levels. Thirteen years of yield data and RTK is used for planting consistency.
- The demonstration site is currently permitted for 58 acres of irrigation, or 9.6 million gallons of water per year to be pumped from the Yellow Medicine River (MNDNR permit #2016-0797).
- A drip irrigation system CAD design has been devised by Maxwell Irrigation. The system will be installed by Nutradrip.
 - The drip irrigation system would consist of 6 different zones approximately 9.5 acres each. The zones will provide the ability to apply different rates of water and nitrogen within each area.
 - Within the zones, drip tape will be plowed in every 5 feet at 16 inches deep using RTK. This RTK spacing will allow every corn row to have an irrigation/fertigation application within 15 inches from the corn roots.
 - The site will also have a weather station that will track wind, temp, rain, humidity, solar radiation and gdu's. Two to four soil probes will be installed to measure soil moisture in different soil types. Bruce Potter, University of MN Extension and Dr. Jeff Strock, University of MN Department of soil water and climate will help with the experimental design to allow statistical comparisons of 3 management system approaches.
 - The (T0) control zone will consist of three strategically placed 60 feet wide non-irrigated blocks with 100% preplant nitrogen strips running the length of the trial.
 - Treatment 1 (T1) will consist of three, 9.5 acre zone blocks that will have subsurface irrigation and nitrogen application based on in-season crop needs.
 - Treatment 2 (T2) will have three, 9.5 acre zone blocks that will have subsurface irrigation, nitrogen application and additional nutrients, T2 will be our intensive management block. There will be a statistically quantifiable randomized treatment design with three treatments and three replications.
- In-season tissue samples will be collected from V5 to tassel for nutrient analysis. Estimates of photosynthesis/chlorophyll will done by Central Crop consulting using a chlorophyll spad meter. Yields will be measured using a yield monitor. Bruce Potter and Jeff Strock will help with the analysis and interpretation of results. We will use paired comparison to analyze the data. The data that's not normally distributed, we will use non-perimetric analysis. Within the replicated strips we will use sampling points in the different soil types.

FINDINGS AND RESULTS

- **Challenges:**
 - Early April installation caused disturbed/compacted soils for spring planting
 - Limited fertigation was applied in 2017
 - System learning curve
- **Future Expectations:**
 - Soils will mellow back to the natural state after a winter freeze/thaw cycle
 - Significant portion of Nitrogen will be applied through fertigation
 - Yield levels and responses will increase in the next few years

