Improved Flow Measurement for Drainage Water Management in Indiana

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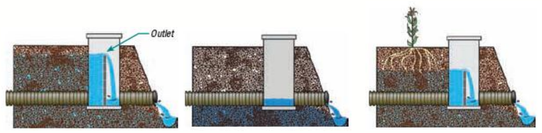
Drainage Water Management

Drainage water management is the practice of raising the water table at certain times of the year while still being able to take advantage of the drainage to improve trafficability and crop yield. This practice has potential to mitigate the difficulties facing corn producers due to a changing climate.



Project Goals

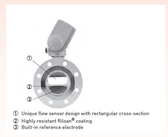
- Determine the impact of drainage water management on drain flow and nitrate load
- Assess the long-term effects of drainage water management on corn production

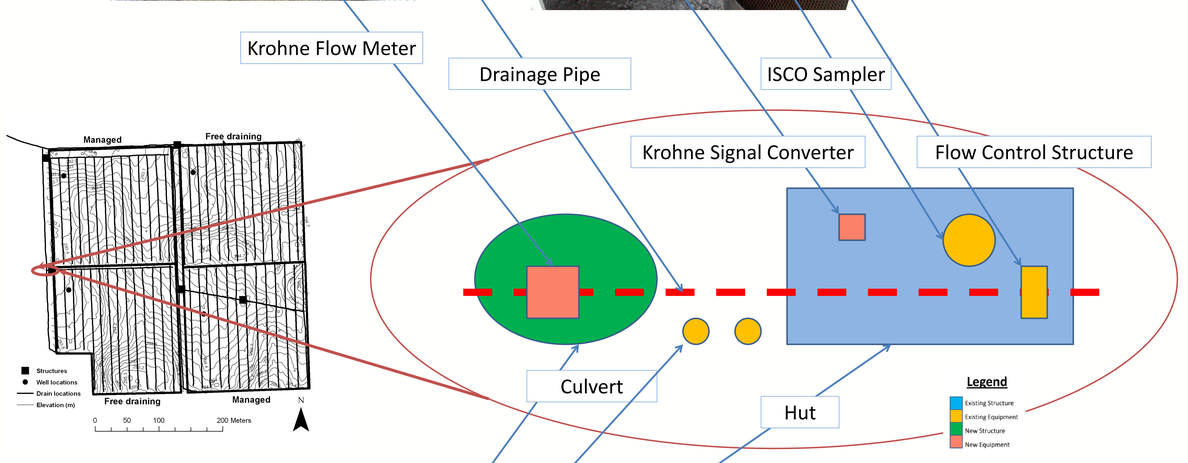
Site History

- Davis Purdue Agricultural Center (DPAC) in east central Indiana
- Drainage system installed in 2005
- 40 acres in 4 quadrants to create a paired, replicated study site
- Drain flow was measured using circular flumes, which will continue to serve as back-up equipment

Drain Flow Monitoring System

- Electromagnetic flow meter : Krohne Waterflux 3000
  - –Advantages are the accuracy at low flow rates due to rectangular cross section as well as little maintenance due to no moving parts
- Signal converter sends pulse signals to Campbell data logger
- Communicates with the internet using a cellular modem
- Circular flume continues to be used as a back up system





Preliminary Data

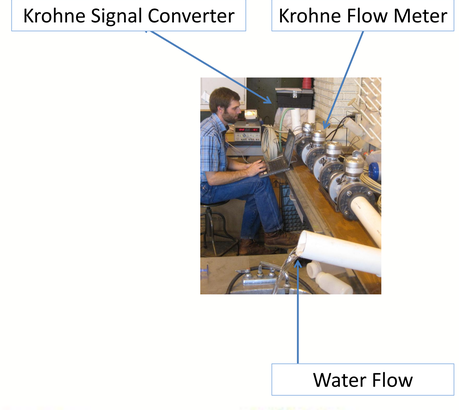
- System installed and started operation on October 21, 2011

Challenges

- Backflow conditions continue to create challenges in understanding flow.
- Trying to create a relationship between the circular flumes and the flow meter data to make the flume data easier to interpret

Testing

- Designed and constructed an apparatus to test and calibrate the flow meters.



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