Current Irrigation Challenges

- Diminishing supplies of irrigation water
- Diminished water quality
- Increasing costs for labor and energy
- Drought conditions
- Salinization of irrigated lands
- Removal of irrigation water from arable lands (Buy & Dry) for municipal and other uses
Some Ways Mobile Labs Can Help

- Help Producers Better Meet Crop ET Needs to Maximize Returns
- Determine System Application Efficiency and System Losses
- Evaluate Current Crop Condition
- Assist With Determining Proper Leaching Fractions for Crops
- Obtain Quantitative Data on Soil and Water Quality Transfer of Technology to Producers
Direct Technical Assistance
• The Mobile Irrigation Labs (MIL’s) will be equipped with modern Watermark moisture sensors.
• Data is displayed graphically for the producer on a logging unit capable of supporting up to six sensors, removing potential operator calibration error.
• Sensors and logger can be temporary or permanent installation
Datalogger Installation
Hansen Datalogger Data
Infiltration Equipment

• Each MIL will be equipped with a Cornell Infiltrometer.

• Operation of the Cornell will allow rapid assessment of current intake rates in the field, allowing appropriate settings for sprinklers and minimizing runoff.

• Can be used throughout the growing season to account for changes in the soil at different crop growth stages.
Cornell Infiltrometer on Pasture
Cornell Infiltrometer in Corn
Water Measurement Equipment

- MIL’s will be equipped with ramp flumes and furrow flumes to allow rapid assessment water applied to the field, runoff, and uniformity between furrows.
- MIL’s will also be equipped with catch cans to allow for sprinkler uniformity assessments.
Soil Sampling Equipment

• Soil auguring equipment will be fitted to allow for detection of “plow pans” or textural changes in the soil to facilitate better uniformity.

• Ball probes will be handed out to producers so they can continue to monitor depth of irrigation and uniformity across the field.
Soil Sampling Equipment
Surveying Equipment

• MIL’s will be equipped with surveying equipment to allow for land leveling, grading of ditches, alterations to head slope due to sedimentation, and other operations to improve DU.

• Noninvasive flowmeters will allow for measurement of flow rates without damage or alteration to the existing pipe.
Survey Data
Salinity Equipment

• MIL’s will be equipped with state of the art DualEM-2 Conductivity Meters and data loggers coupled with Differential GPS.

• DualEM meters operate on a coupled dual-dipole principle allowing for measurements of apparent conductivity at one and two meter depths without contacting the soil.
DualEM
Salinity Maps
Salinity Equipment

- Sodium concentrations can be determined by analysis of saturated soil pastes using a Hach Kit and Ion-Specific electrode.
- Conductivity, pH (Hydrogen Ion Concentration), and other parameters of irrigation water can be determined by use of onboard meters.
- Appropriate leaching fractions can be determined.
Other Equipment

• Infrared thermometers and chlorophyll meters will be used to determine crop condition and assist producers in making the decision to irrigate.
• Imhoff cones will be used to help assess and manage sedimentation problems.
• Onboard computer support will allow producers to receive real results in the field, supplying information when it’s needed.
• Other equipment will be added to the MIL’s as current technology evolves.
Mobile Office