



CONSERVATION ENHANCEMENT ACTIVITY

E449C

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 2-5, soil moisture monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

Advanced automated irrigation water management using soil moisture or water level monitoring (installed as per IWM plan) with data loggers.

Criteria

Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

- An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
- Methods used to measure or determine the flow rate or volume of the irrigation applications.
- Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
- Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
- Irrigation water management plan explains:

E449C - Advanced Automated IWM – Year 2-5, soil moisture monitoring	August 2019	Page 1
---	-------------	----------



CONSERVATION STEWARDSHIP PROGRAM

- How irrigation system meets crop needs, while maximizing irrigation water efficiency.
- Seasonal or annual planned water application volumes by crop.
- Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
- Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
- Information on how to recognize irrigation induced erosion and how to mitigate it.
- How data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
- Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station
- Recordkeeping documents for the irrigator to use during operation and management.

ND Sideboards

1. This enhancement may be used in either of the following circumstances: in conjunction with E449D, or as a follow up to an EQIP contract that included implementation of IWM, Advanced.
2. ND NRCS will develop a site specific Irrigation Water Management Plan prior to implementation, utilizing the ND IWM Template, which includes guidance to the producer on sensor placement, weather station placement, and record keeping. Alternatively, the producer may provide an IWM Plan developed by a ND P.E., subject to a functional review and approval by NRCS.
3. Flow meters are required to be installed as necessary to accurately account for the quantity of water applied to each individual field. If meters are not tied into the pivot panel for automatic recording, the producer will be required to keep side records for each individual application.
4. Sensors must include a data logger that records daily soil moisture levels, at multiple depths, and transmits information electronically to the operator in real time. Acceptable sensor types include Time Domain Transmissivity, Capacitance Sensors, Tensiometers, or Granular Matrix Sensors.
5. A weather station is required unless an active NDAWN station is located within 5 miles of the irrigated field.
6. At the completion of each irrigation season prior to the end of the calendar year, NRCS and the producer will complete a technical evaluation of IWM utilizing the ND IWM Certification Tool. If a subscription service can provide comparable data (daily record of irrigation, rainfall, soil moisture), in an alternate format, that will be considered an acceptable substitute for documentation.

**All end of the season consultations require 449 JAA*

E449C - Advanced Automated IWM – Year 2-5, soil moisture monitoring	August 2019	Page 2
---	-------------	----------



CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (449) requirements.
- During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.
- After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
 - Irrigation water management plan and records kept
 - Changes made to address distribution uniformity deficiencies

NRCS will:

- Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (CPS 449) as it relates to implementing this enhancement
- As needed, provide additional technical assistance to the participant as requested.
- After implementation, verify implementation of the irrigation water management plan, by reviewing participant records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

NRCS Technical Adequacy Signature

Date

E449C - Advanced Automated IWM – Year 2-5, soil moisture monitoring	August 2019	Page 3
---	-------------	----------