



CONSERVATION ENHANCEMENT ACTIVITY

E449H

CONSERVATION STEWARDSHIP PROGRAM

Intermediate IWM— Years 2 -5, using soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

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

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Monitoring soil moisture or water levels within an irrigated field for implementing an intermediate irrigation water management plan using soil moisture data to facilitate management decisions.

Criteria

- Equipment previously installed (through preceding enhancement) must include soil moisture sensors with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system; and permanent flowmeter.
- Monitoring of the following items required:
 - Irrigation water applied
 - Crop water use
 - Status of heat and/or frost conditions to permit the producer to make informed irrigation decisions

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- Perform regular maintenance and monitoring of equipment with data collection systems that continuously record data throughout the irrigation season.
- Follow an irrigation water management plan which 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 sensor/water level sensor locations (if used), and soils.
 - Method used to measure or determine the flow rate or volume of the irrigation water applications.
 - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field.
 - Documentation of the scientific method used to schedule the timing and amount of irrigation application.
 - Irrigation water management plan explaining:
 - How irrigation 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 ensure uniform irrigation.
 - Information on how to recognize irrigation induced erosion and how to mitigate it.
 - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions.



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- Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station.
- Record keeping documents for the irrigator to use during the operation and management.

Additional Criteria of Soil Moisture Devices

- Soil moisture sensors collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region.
- Number of soil moisture data sets will be based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of Flow Measurement Devices

- Permanent flow meters data collected at all wells/reliefs that are included in the approved IWM plan.

Additional Criteria of Water Level Devices

- Data from sensors installed in a basin field from data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day.

Additional Criteria of Weather Stations

- Weather station data from a central location as defined by the irrigation water management plan
- Weather station record includes each of the following at a minimum of four times per hour:
 - High and low temperature
 - Precipitation



- Humidity
- Wind speed and duration and direction
- Solar radiation.

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Documentation and Implementation Requirements

Participant will:

- Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- During implementation, ensure each irrigation water management device functions as intended.
- 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.
- During implementation, monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data.
- After implementation, make the following documentation available for review by NRCS to verify implementation of the enhancement:
 - Irrigation water management plan and associated records.
 - Changes made to address distribution uniformity deficiencies.
 - Documentation demonstrating utilization of any sensor used throughout the growing season.

NRCS will:

- Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements as it relates to implementing this enhancement, including applicable state specific job sheets.
- Prior to implementation, assist with data interpretations needed for management decision making.
- Prior to implementation, provide additional assistance to the participant as requested.



- After implementation, verify implementation of the irrigation water management plan by reviewing records kept during enhancement implementation.

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Design Approvals & Acknowledgements:

Design Approval	Date	Job Approval Authority
Designed by:		
Approved by:		

Client's Acknowledgement Statement:

The client acknowledges:

- I have received a copy of the specification and understand the contents and requirements.
- It is my responsibility to obtain all necessary permits and/or rights and to comply with all ordinances and laws pertaining to the application of this practice.
- I will not begin installation of this practice until I have received appropriate approval to do so. I understand NRCS also has Federal and state laws to comply with that may take some time to address (e.g. cultural resources).

Client's Signature	Date

Certification Documentation:

	Field Evaluation: Post-treatment inventory, measurements, notes, as-built, and supporting documentation (document completion in conservation plan), as required.
	Map(s): Including field numbers, fields treated, and units treated (may document on conservation plan map), as required.
	Photos or other supporting documentation (e.g., seed tags, soil tests, receipts, invoices, spray records, fertilizer records, etc.)
Brief Description of Work Accomplished (types of equipment used, date of application, extents and quantities installed, etc.)	

Certification Statement:

The employee certifies the implementation of this conservation practice:

- Meets the purpose, general criteria, and any required additional criteria as documented in the conservation practice standard and/or enhancement sheet.
- Meets the specifications contained herein and is complete.
- Conforms to my existing Job Approval Authority controlling factors and levels.

Name	Date	Job Approval Authority

Field Level Certification – For multiple applications of this design.				
Land Unit/ Contract Item Number	Date	Unit(s)	Amount Installed	Certifier