



**CONSERVATION ENHANCEMENT ACTIVITY**

**E449F**

**CONSERVATION STEWARDSHIP PROGRAM**

Intermediate IWM— Year 1, Equipment with 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**

This activity involves monitoring soil moisture or water levels within a irrigated field for intermediate irrigation water management include installation of equipment year 1.

**Criteria**

- Equipment may include: soil moisture sensor with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system; permanent flowmeter.
- Data to be monitored includes: irrigation water applied, crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- The installation includes the purchase and installation of equipment with data collection systems that can continuously record data throughout the irrigation season.
- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

E449F - Intermediate IWM – Year 1, Equipment and soil moisture or Water level monitoring	January 2022 Colorado	Page   1
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# CONSERVATION STEWARDSHIP PROGRAM

- 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.
  - 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 the operation and management.

### ***Additional Criteria of soil moisture devices***

- Installation of each soil moisture set will include the ability to collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region.
- Number of soil moisture sets will be installed 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.

E449F - Intermediate IWM – Year 1, Equipment and soil moisture or Water level monitoring	January 2022 Colorado	Page   2
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## CONSERVATION STEWARDSHIP PROGRAM

### ***Additional Criteria of flow measurement devices***

- Permanent flow meters will be installed at all wells/relifts that are included in the approved IWM plan.

### ***Additional Criteria of water level devices***

- Sensor is installed in a basin field with a 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 is installed in a central location as defined by the irrigation water management plan, but no more than 2 miles separation.
- Weather stations will record 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



# CONSERVATION STEWARDSHIP PROGRAM

## Documentation and Implementation Requirements

### **Participant will:**

#### *Prior to implementation*

- Acquire an irrigation water management plan meeting NRCS Conservation Practice Irrigation Water Management (Code 449) requirements
- Acquire NRCS approval of all irrigation water management devices that will be utilized for the plan implementation

#### *During installation or implementation*

- Ensure each irrigation water management device is installed to manufacturer recommendations
- Record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data
- 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 items available for review by NRCS to verify implementation of the enhancement:
  - Irrigation water management plan is followed, and records kept.
  - Changes made to address distribution uniformity deficiencies.
  - Utilization documentation of any sensor used throughout the growing season as well as certification of their proper installation.

### **NRCS will:**

#### *Prior to implementation*

- Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement.

E449F - Intermediate IWM – Year 1, Equipment and soil moisture or Water level monitoring	January 2022 Colorado	Page   4
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# CONSERVATION STEWARDSHIP PROGRAM

- Provide additional assistance to the participant as requested.
- Review and approve producer’s selected equipment

*After Implementation.*

- Verify installation of all irrigation water management equipment.
- Verify implementation of the irrigation water management plan by: reviewing 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