United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449H (WITH MONTANA SUPPLEMENT)

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) may 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

- 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.

- 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/relifts 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, review the previous year NRCS-approved IWM plan with the participant to ensure that the plan is applicable to current management; revise the plan as needed to meet NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements and participant objectives.**
- ☐ Prior to implementation, assist with data interpretations needed for management decision making.

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- ☐ 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.

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