United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E44914Z8

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 1, Equipment and soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

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

RESOURCE CONCERN ADDRESSED: Insufficient Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

This activity includes installing and monitoring soil moisture or water leveling equipment for advanced automated irrigation water management. The equipment includes field specific weather station data with soil moisture monitoring (one sensor station per 40 acres or less), data loggers and telemetry. Sensor stations will include a minimum of 2 sensors per site at depths appropriate for the crop and soils. If rice is the major crop, water level sensors may be substituted for the soil moisture sensors.

Monitoring will be for the entire irrigation season and data gathered will be used to predict and manage irrigation water on crop grown.

Criteria

- Equipment may include; weather station, sensors, flow meter, data loggers, cellular service, as needed to monitor soil moisture, determine and forecast crop water use and remotely control irrigation system.
- Subscription service provided by others may be used as alternative.

- Data to be monitored includes 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, and a data logger to log continuous weather data including rainfall, temperature, solar radiation, humidity, wind speed and soil moisture/water level sensors data that can be downloaded to a personal computer and associated graphing software.
- Producer monitors the station during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensors, field checks and weather station data.
- Producer keeps records of collected data and resulting irrigation decisions. This enhancement only applies to year one of IWM. The appropriate labor-only IWM enhancements apply in subsequent contract years.
- Weather station is installed on the farm and within 1 mile of fields where practice is implemented. The weather station will record each of the following (at a minimum of four times per hour),
    - High and low temperature
    - Precipitation
    - Humidity
    - Wind speed and duration
    - Solar radiation
- Sensors, datalogger and required telemetery are installed on fields where practice is implemented as indicated in the Irrigation water management plan.
- 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;
    - 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.
    - Indicate 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

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 (Code 449) requirements.
- ☐ Prior to implementation, acquire NRCS approval of selected weather station, sensors, data logger, etc. or subscription service.
- ☐ During implementation, ensure installation meets manufacturer recomemndations.
- ☐ 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:
    - o Irrigation water management plan and records kept
    - o Changes made to address distribution uniformity defficiecies
    - o Documentation of weather statation, sensors, data logger, etc. installation to NRCS

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement
- ☐ As needed, provide additional assistance to the participant as requested.
- ☐ Prior to implementation, review and approve producer's selected weather station, sensors, data logger, etc. or Subscription service.
- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ After implementation, verify installation of weather station, sensors, etc.
- ☐ After implementation, verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.

CONSERVATION STEWARDSHIP PROGRAM

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