

# URNRD Soil Moisture Probe Program

**Annual Report, March 2023**

*Water Sustainability Fund Application #5301*



A \$123,840 grant was awarded to the Upper Republican NRD (URNRD) by the Natural Resources Commission and a contract was executed with the Department of Natural Resources in November 2020 to incentivize the use of soil moisture probes within the URNRD to reduce crop-irrigation water use. This status report includes project inception, through March 30, 2023.

## **Project Progress**

Demand for soil-moisture probes offered under the cost-share program was slightly lower than in 2021, the first year of the cost share program funded by this grant, but slightly higher than average demand over the approximately 10 years the URNRD has incentivized probes using different grants.

We began publicizing the program in January 2022 and accepted applications through June 2022. Publicity occurred in Chase, Dundy and Perkins Counties; news releases describing the program mentioned that it was made possible by the Water Sustainability Fund. Application forms for the program also mentioned the Water Sustainability Fund.

During the application period, applications from 40 individuals and entities throughout the URNRD were received requesting cost share for 100 soil moisture probes. This compares to applications for 117 probes in 2021. Because the number of applications for probes didn't exceed available funding, all applicants were approved for cost share in 2022.

It's important that we expose as many people as possible to the benefits of using soil-moisture probes. To do so, we limit to three the number of probes we'll cost-share with each participant. We don't dictate what types of probes participants use under the program and refer applicants who

haven't used probes before to all known dealers of probes in the area. All of them are telemetry-equipped probes that relay data and irrigation recommendations electronically via cellular networks.

The program requires participating irrigators to pay for the probes they plan to have installed. After they have paid, they submit the probe invoices they received from probe vendors to the URNRD. The URNRD then reimburses participants for half of their qualifying costs. Subsequently, the URNRD submits requests to the Department of Natural Resources for the URNRD to be reimbursed for 60% of the amounts that the URNRD reimbursed participants. The net result on a \$1,600 probe, for example, ends with the participant paying \$800, the Water Sustainability Fund \$480 (60% of the remaining \$800), and the URNRD paying \$320 (40% of the remaining \$800).

The total cost of the probes cost-shared in 2022 was \$100,115.03. Participants were ultimately responsible for \$50,057.51, the Water Sustainability Fund \$30,034.50, and the URNRD \$20,023.01. The URNRD requested and received reimbursement from the Water Sustainability Fund in early 2023.

The probes typically relay moisture data for every 4" of soil depth up to approximately 4'. Software offered by most vendors compare actual moisture content to suggested moisture levels to provide recommendations on whether irrigation is needed.

Irrigators who commonly use probes report that using them reduces the amount of water they would otherwise apply by approximately 1"-3" per acre. This level of savings is consistent with studies of improved irrigation scheduling by using soil moisture data.

In 2022, probes funded by the program were used to help make irrigation decisions on approximately 13,000 acres (100 probes x 130 acres per field). Assuming actual, reduced water use was the midpoint of the 1"-3" range of expected reductions in water usage due to probe use, or 1.5" per acre, total reduced water usage in 2022 caused by probes incentivized by the program was approximately 19,500 acre inches (1.5" x 13,000), or 1,625 acre feet. That is equal to about 529 million gallons of water. Assuming a household uses about one-half acre foot annually, the amount of reduced water usage is roughly equal to the amount of water 3,200 households would use in a year.

The URNRD is generally a densely irrigated region and most of the irrigation development within it occurred before NRDs had authority to manage and regulate water usage. Combined with the semi-arid climate of the area where annual average precipitation is 17"-20", this has led to pervasive groundwater declines. Regulations including limits on how much water irrigators can use have been in place since the late 1970's and have slowed groundwater declines; the use of soil moisture probes and other irrigation technology can help further slow decline rates.

### **Current and Upcoming Activities**

In January 2023, we began accepting applications to provide probe cost share for the 2023 irrigation season. At the time of this writing, we have received applications from 29 individuals and entities to receive cost share for 78 probes to be used in 2023. Please feel free to contact us with any questions about the program.

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