



Soiltech moisture sensor device.

Finding ways to conserve water is crucial for Southern Idaho farmers in the drought summer 2026. Twelve Mini-Cassia farmers have been using Soiltech moisture monitors in their fields to track soil moisture, humidity and temperature over the last three years. (Soiltech photo)

MINI-CASSIA PRODUCERS EXPERIMENT WITH SOIL MOISTURE SENSORS TO SAVE WATER

By Steve Stuebner

Producers in the Mini-Cassia region of Southern Idaho are finishing up the third year of a Moisture Monitoring project involving the use of Soiltech moisture sensors in crop fields.

The Soiltech moisture sensors provide real-time data on soil moisture, temperature, and humidity. A number of farmers in the East Cassia, Minidoka and West Cassia Soil and Water Conservation

Districts say they are getting improved real-time information about soil moisture, which can help landowners be more precise with their use of water for irrigation.

Some of the Mini-Cassia farmers have commented that they didn't realize that they had been over-watering their crops, District officials said. By using the moisture monitors, they have been able to reduce pivot sprinkler rotations, officials said.

"It's been really insightful to see what the soil moisture conditions are," said Jason Webb, an East Cassia District farmer who grows sugar beets, potatoes, wheat and corn. Webb has been using the sensors in potato and beet fields. "It's been a good tool for us."

The hardest part is getting everything set up, Webb said. The Soiltech sensors need to be buried 6"-8" below the ground in crop fields, and software and apps need



Moisture monitors should be buried about 6"-8" in a field so they can detect moisture, humidity and temperature in the plant root zone. (Soiltech photo)

to be installed on a smartphone to monitor the soil conditions. Once those things are in place, you can establish a baseline and then check the monitors for soil moisture, humidity and temperature.

"It's a little more precise in checking your soil moisture," he said. "But it's still a good idea to dig into your fields and check on soil moisture that way as well. There's never a replacement for that."

An AT&T-Soiltech case study found that irrigators using soil moisture sensors can see a 10 percent reduction in water use, or a savings of 500 million gallons across 10,000 acres of irrigated farmland in a typical growing season.

"In a year when water is tight like this one, I know the growers have at least 50 things to worry about, so if you can save some water with Soiltech sensors, that can provide

a little peace of mind," said Ehsan Soltan, CEO of Soiltech.

Emily Bedwell, Ph.D., a University of Idaho Extension Irrigation Specialist based in Kimberly, agrees. "Absolutely, it's an important tool to help producers optimize their water use this year."

Bedwell is experimenting with the Soiltech moisture sensors on a sugar beet field and cover crop mixes at the University of Idaho Kimberly Research and Extension Center. The moisture sensors are valuable because they provide information about the soil moisture in the plant root zone below the earth's surface, she noted.

The sensor units provide detailed readings on moisture in the soil. "It's a percentage of units of water per units of soil," she said. "Different plants have different water needs.

And the crop water needs are dynamic throughout the growing season."

The Moisture Monitoring Project began in 2024 when the East Cassia, Minidoka and West Cassia districts had the idea of running a project where landowners could try out moisture monitors to see if it could help them to better manage their irrigation. The Districts planned to encourage landowners to participate in the project by covering a large percentage of the expenses. Twelve growers signed up for the project and 52 monitors were purchased. At the end of the three-year project, the growers will own the moisture sensors and can continue to use them.

"Cover Crops have been the subject of education by the Districts since 2017. We are now going underground – in the ground with moisture monitors. These monitors could be the next generation of technology in helping our growers understand soil moisture with real time data," the Districts said in an information sheet distributed to local producers.

The cost to the growers was \$1,050, officials said. The total investment for the Districts and each producer

LOW INTEREST LOANS FOR IDAHO SOIL & WATER CONSERVATION

- Sprinkler Irrigation
- No-Till Drills
- Fences
- Livestock Feeding Operations
- Solar Stock Water Pump Systems

3% - 6%
Terms 7-15 Years
Up to \$600,000

swc.idaho.gov

(208) 332-1790

was \$2,451 to cover the cost of 3 monitors, along with a 3-year subscription per monitor and one antenna. Some growers purchased extra antennas, hoping to more easily collect data.

In 2024, a soil moisture monitoring project featuring the Wood River and Gooding soil conservation districts also showed positive results (story was featured in the February 2024 issue of Conservation the Idaho Way). In that project, the districts received a grant from the Water Quality Program for Agriculture (WQPA) to help cover program costs.

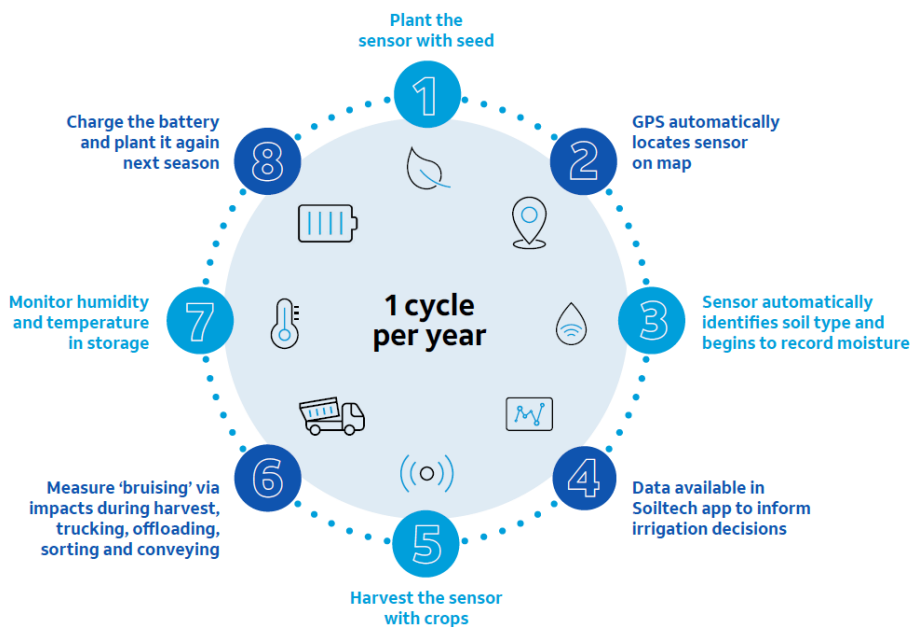
In the Mini-Cassia Moisture Monitoring Project, the three Districts paid for approximately 60% of the project costs, and the growers paid for approximately 40%. These costs included the purchase of the monitors, one antenna for each grower, and the data subscription. The project also included a Grower Forum each year to provide education and help in using the equipment.

It's important to install antennas with the Soiltech sensors so they can easily transmit data when they're buried in the soil, officials said.

The Mini-Cassia Districts' goal in financing such a large portion of the project was to provide an incentive for local producers to try them out, officials said.

With a drought summer and water-short supplies gripping many producers in Southern Idaho, conserving water will be crucial to stretch irrigation supplies as far as possible so farmers can produce a good crop.

Carolyn Firth, Agricultural Program Specialist for the Conservation Commission, notes that conserving water in the Mini-Cassia region is



Recommended actions using Soiltech sensors through one year of operations. (Soiltech graphic)

important for additional reasons. The farms overlie the Eastern Snake Plain Aquifer (ESPA) Ground Water Management Area (GWMA), and they have 303(d)-listed water bodies that run through them, meaning that some beneficial uses are not supported.

In Cassia County, in addition to it being within the ESPA GWMA, it also has five Critical Ground Water Management Areas located within it. "So water quantity is a major resource concern," Firth said. "Groundwater quality is also a major resource concern, since a significant portion of Minidoka County is a Nitrate Priority Area, ranked #3 in the state, and the northern part of Cassia County (Marsh Creek Nitrate Priority Area) is ranked #5 in the state."

"If producers watch their irrigation use carefully, the risk of water transporting nitrates into groundwater will be decreased," Firth said.

More Producer perspectives on the Soiltech sensors

Chad Searle, Supervisor of the West Cassia District, said he has been using four moisture sensors in his fields. He grows sugar beets, corn, wheat, alfalfa and beans.

"The sensors give you a 2nd opinion or a little more peace of mind about your soil moisture," Searle said. "They've been working pretty well, but the software isn't real user-friendly. I've struggled a little bit at times with connectivity issues. I've been working with the techs to help me understand it better."

Searle does recommend the product to help producers know when their fields have been watered enough or need more water. "Overall, I've been pretty happy with them," he said.

Lucas Spratling, an East Cassia farmer who raises crops in the Raft River area, said he put three of the sensors in a 125-acre field to get a more precise idea of soil moisture. "You can find that some parts of the field are quite dry and others are too wet," he said.

He irrigates the field with a center

pivot. "It's crucial to know what's going on with the soil moisture in your crop field," he said.

Spratling noted that the Raft River area has received only 2 inches of moisture since January. The Raft River Basin is part of a Critical Ground Water Management Area, managed by the Idaho Department of Water Resources. Next year, the Raft River Basin will be managed as part of the ESPA Area of Common Groundwater Supply. Producers in the area will be subject to potential groundwater restrictions based on a longstanding water call by the Surface Water Coalition in the Magic Valley. All of those things will make it even more critical for Raft River producers to manage their water wisely, Spratling said.

Some growers have converted their pivot sprinklers to low-elevation spray application (LESA) irrigation systems, which feature tubes that extend from the pivot to the top of crops to reduce water and evaporation losses. LESA systems can reduce water use by up to 18%. Less water use also can save on energy pumping costs.

"There's no one solution to this issue," Spratling says. "It's going to take a combination of things to make it work."

Aaron Firth, District Agriculture Manager for Amalgamated Sugar and a former ag crop consultant, agrees. Firth assisted producers in the Minidoka Soil Conservation District with a moisture-monitoring

project using Soiltech sensors in 2023.

"We bought 70-75 of those sensors for that project, and shared them with 12 different growers. They put 3-4 sensors in each field," he said. "That project worked out well. Several of the producers said they saved about 1-2 inches of water that year."

More tips on water-saving techniques

Installing LESA on pivots is another way to save water, as Spratling noted. Producers also can buy smaller nozzles to reduce water use, he said.

Another water-saving tip: Farmers may want to try a free online irrigation scheduling tool available from Washington State University, Firth said.

That tool is integrated with AgWeatherNet and many other agricultural weather networks throughout the Western United States. It works well on any mobile phone as well as any computer that has internet access. It automatically gets Evapotranspiration (ET) and rainfall estimates from weather stations and tracks the soil water deficit so growers can know when to irrigate and how much.

AgriMet stations in Southern Idaho provide that free service if producers get signed up to use it, Firth said, adding, "That free tool can be almost as helpful as in-soil moisture monitors."



Producers can track soil moisture on their smartphones and computers. An app must be installed to track the information. (Courtesy Soiltech)

Bedwell agreed with Firth's recommendations on water-saving techniques. She also recommended that growers could save water by irrigating at night, when there is less wind and less evaporation. Growers should research the specific needs of the crops they're growing, she said. "Sugar beets and potatoes have higher water needs compared to small grains. Your crops are going to have different water needs during the growing season as well."

She commended the Mini-Cassia Districts for providing an incentive for producers to try the soil moisture sensors. "There's such a risk for producers when it comes to trying new things," she said. "Incentive programs like that can reduce the risk and encourage producers to improve their operations."

Steve Stuebner writes for Conservation the Idaho Way on a regular basis.

COMMISSION

- Erik Olson, Chairman
- Wendy Pratt, Vice-Chairman
- Blake Hollingsworth, Secretary/Treasurer
- Karen Sharpnack, Commissioner
- Mitchel Silvers, Commissioner
- Joan Cloonan, Commissioner
- Richard Savage, Commissioner
- Mathew Weaver, Interim Administrator



**SOIL & WATER
CONSERVATION COMMISSION**

322 East Front Street, Suite 560 Boise Idaho
83702 P: 208-332-1790 • ww332-1799
info@swc.idaho.gov • www.swc.idaho.gov

Conservation the Idaho Way: Sowing Seeds of Stewardship