

# Watermark delivers continuous reading

By LEN RICHARDSON

**L**AB analysis helps determine the economical use of fertilizer and amendments to maximize production and crop quality. Growers want accurate and dependable information to eliminate guessing so their decisions add greater value.

Joe O'Brien, Valley Tech Agricultural Laboratory in Tulare County, Calif., provides such information to growers with soil and plant tissue analysis. Ken Schneider with Alluvial Ag Consulting, Sanger, Calif., and O'Brien are using a data-logging Watermark Monitor to offer irrigation management services. They have more than 120 valley customers taking advantage of their programs.

## Save moisture readings

The Irrrometer Watermark Moisture Monitor is a data logger that activates records and saves Watermark sensor soil moisture readings in the field, until the grower or consultant can download the data.

Watermark sensors are granular matrix sensors that were introduced by Irrrometer 15 years ago and produce readings based upon resistance similar to the long-revered tensiometer. The

## Key Points

- Watermark Moisture Monitor saves soil readings for later download.
- Sensor can be queried every 15 minutes to see the root zone changes.
- Radio telemetry allows office viewing of field moisture in real time.

Watermark sensors are rugged, user friendly and affordable, says O'Brien.

With the addition of a data-logging monitor, continuous soil moisture monitoring is available around the clock, throughout the season. The monitor can be programmed for reading soil moisture, soil and air temperature, and irrigation start times and duration for pressured systems. The data is downloaded with a software program for detailed review of the irrigation events.

## CIMIS experience

O'Brien has more than 20 years of experience with neutron probes, pressure chambers, tensiometers, and the hand-feel methods of soil moisture monitoring and irrigation scheduling, coupled with California Irrigation Management Information System evapotranspiration weather data.



**DATA LOGGER:** A moisture monitor is a data logger that activates records and saves Watermark soil moisture reading until the grower can download data.

"So much information is overlooked with the once-a-week visits to measure the soil moisture," O'Brien says. "More measurements produce more information that provides a confident understanding of the data.

"We can project when to irrigate and we will also know what happened after the irrigation, how long it took to infiltrate through the profile, how long the root profile remained wet and whether any adjustments are required."

Adds O'Brien: "With Web access to CIMIS data and the power of continuous moisture monitoring, the grower can determine the effectiveness of an irrigation and track water usage practically to the drop."

Both O'Brien and Schneider download monitors weekly during the growing season and produce graphs depicting recent events with the Watermark software program. The graphs are then e-mailed with comments for the growers to review. As growers become familiar with the system, they can make faster irrigation application decisions, the experts say.

"I program a Watermark Data Logger to query the sensors every 15 minutes. I can see the moisture changes in the root zone with that frequency and am able to make irrigation scheduling advisories way before any stress might occur, even if the weather changes quickly as it can in late spring," Schneider says.

"Switching to the continuous readings provided by the data loggers instead of taking biweekly readings with a handheld meter has helped me zero in on active crop transpiration coupled with field evaporation, and get water in the ground before the crop gets in trouble. I can also see when adequate moisture is there, and delay or shorten an irrigation when necessary," Schneider continues.

## Major advantages

The Irrrometer Watermark has three advantages over traditional access tube devices, say O'Brien and Schneider:

■ Sensors can be placed to provide a spatial 3D picture to determine the depth



**WATER USE:** With Web access to California Irrigation Management Information System data and continuous moisture monitoring, you can establish irrigation efficiency.

of soil moisture movement and the expanse of the wetted zone. "I often place the sensors directly under drip emitters but also 2, 3 and 4 feet away, out to the wetted edge in an attempt to obtain the complete picture and actually define the wetted zone," O'Brien says.

■ The tracking of irrigation with the system's pressure-sensitive switches in the drip hose allows recording the duration of irrigation to the closest 15 minutes. This is helpful for fine-tuning water budgets.

■ The monitor is mounted in the field to obtain real-time sensor information. The grower doesn't have to wait for a service provider to make their weekly reading to get up-to-date information.

Schneider works with two growers who have added radio telemetry to the data loggers, enabling them to download and view field moisture on their office computers in real time. "One of my customers has his office in San Jose," he says, "and can't visit his East Valley tree projects routinely, allowing him to check irrigation scheduling any-time, from his office in town."



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