



A single monitor per irrigation circle gives growers an accurate picture of soil moisture levels and makes the decision on when to water much more precise after heavy rains or periods of drought.

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possible. We try to keep things simple, because I have to be gone a lot with my day job,” he explains.

Today, the rolling farm of varied soil types produces 220- to 240-bushel no-till corn per year and 60-bushel soybeans.

NEW WATER USES

Till has always had the water, but the yields have grown during the past several years because of how he uses and manages it.

“About half of our farm is bottomland, swampy, low-lying, heavy soils,” he explains. “The remainder is upland geography with an incredible number of soil types that each have unique moisture-holding qualities. We literally have clay to sandbox sand, and we have several soil types in each field.”

Till says his area can be extremely hot and dry for up to two weeks at a time, but the land also can receive generous amounts of rain from summer thunderstorms.

“If you don’t have water during one of those dry spells, you get hurt,” he explains. In the past, he has used sprinklers to keep the top 4 to 6 inches of the field moist during the growing season. “And, what I was doing was overwatering the lowlands and underwatering the higher ground. Really, I’m not sure why I didn’t realize what I was doing sooner.”

Till says things changed for the better five years ago, when he began watering based on in-field soil-moisture monitors provided through Southern Crop Solutions, a regional farm service business in Holly Hill, South Carolina. He works with Robbie Weathers.

“He understands the importance of data and data management in today’s farming operations. What he taught me with the AquaSpy moisture monitors has been good for a conservative yield increase of 20 to 30 bushels of corn per acre,” Till explains.

Yields have grown steadily during the five years he’s monitored subsoil moisture. It wasn’t just the bottomland that improved. “We saw we needed to put more water on our higher ground, because the sandy loam there doesn’t hold as much water,” he says.

Till nozzles his drop-equipped Reinke sprinklers based on pumping capacity and operating pressures.

He’s trying to boost pumping rates. “Where I was running 800 gpm, I’m going to 1,100 gpm, because it’s important to be able to get around quicker, particularly in blistering hot summer dry spells,” he says. “My goal is to be able to apply ¾-inch of water every day under each pivot.”

Probing The Depths

In-field moisture monitoring decreases water use and increases corn yields.

John Till lives close to irrigation utopia. He has the ability to run nearly all 15 of his center pivots at one time with five deep wells filling surface water ponds. The ponds enable 13 pivots to run 800 to 1,100 gallons of water per minute (gpm). Two sprinklers run similar capacities drawing groundwater from about 550 feet.

Till, a full-time physicist and owner of a company devoted to measuring airborne radioactivity, farms land near Orangeburg, South Carolina. It’s been in the family for years.

“We’re not big as farms today go,” Till explains. The farm is 1,000 acres, 500 tillable planted to corn and soybeans. The rest is in timber and managed woodlands.

“As a scientist, my goal is to see what I can do farming mainly on weekends to make the place as productive as

BETTER DATA MANAGEMENT

Till is one of many irrigators in southern South Carolina and across the country also benefiting from data he receives from monitors that register soil moisture in 4- to 6-inch intervals from the surface down to 48 inches.

Southern Crop Solutions' Weathers oversees irrigation monitoring on about 13,000 acres of diversified agriculture. He says evening out irrigation over different soil types is only one way to improve yields and conserve water with moisture meter data.

"Knowing when to irrigate, when to start and when to start back after a rain can make a tremendous difference in water use and reduced plant stress," Weathers says. "Irrigation is easy when it doesn't rain. You just run every two to three days. It's rain that throws timing off and makes it difficult to know when to water."

Weathers says summer thunderstorms are plentiful in his area, but depending upon how fast they are moving, a 2- to 3-inch rain can be tricky to manage.

"What goes in the rain gauge is important, but so is how long it took to accumulate," he explains. "That's why knowing how much moisture is in each progressively deeper strata is very important in irrigation scheduling."

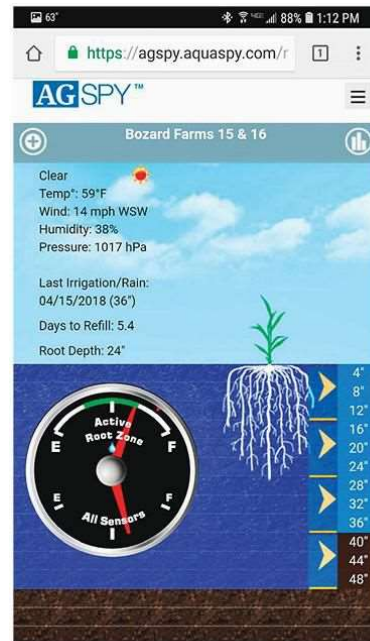
Weathers says the sweet spot for soil moisture for corn in his area is between 6 to 12 inches.

"Every year, I have growers who look at their field and see a moist topsoil around

John Till says moisture meter data collected at monitors helps him even out irrigation over different soil types.



This screenshot of an AquaSpy soil-moisture monitor provides growers with a "fuel gauge" readout that indicates moisture levels in the active root zone. The monitors measure layers of soil down to 48 inches and provide a window to soil-moisture deficits and recharge at a glance.



their plants, and tell me the moisture probes are wrong," he says. "Every year, I take a post-hole digger out, and, sure enough, at 12 inches down, the soil is dry, and the plants are stressed."

Till agrees, saying he's learned to use the moisture data to anticipate watering.

"So many growers wait until you get into 90-degree days, and the moisture is eliminated from the ground and root zone before they turn on the sprinklers," he explains. "By having sensors, I can see that moisture curve headed down as the plants extract water from the profile, and I start planning my irrigation. I want to anticipate far enough ahead that no one corn plant suffers." He's not perfect at the practice, he admits. "But, the monitors allow me to see what will happen if I don't water, or if it doesn't rain."

GAINING TEST WEIGHT

Weathers says soil-moisture data is making money for several of his corn-grower clients through improved test weights.

"You want to keep moisture available to the plant until it shuts down," he explains. "If I'm going for test weight, I want to get the planting right, I want maximum kernel count, and I want that ear to fill to its capacity and stay there."

"Every pound of test weight is equal to a 2% increase in yield," Weathers continues. "If you're producing 56 to 57 pounds per acre and can raise it to 60 pounds by filling the kernels more effectively, you've just created a 3 to 4% yield increase with no more kernels."

The monitors are not inexpensive. They cost about \$1,800 for the first year's installation per probe plus a \$1,000 monitoring subscription and removal costs at the end of the year. Each year after that, the cost reflects only the \$1,000 monitoring fee.

Till dismisses the cost as "inconsequential," even on his smaller-than-average row-crop operation, because of the improved water efficiency and yields made possible by the timely information. ///