**Farmers increasingly using technology to aid in irrigation decisions**

K-State engineer says getting the right information is key when watering crops

MANHATTAN, Kan. – Across Kansas, farmers wrestle with the quandary of when to water thirsty crops – and how much of the precious resource they should use.

“What it boils down to,” says Kansas State University irrigation engineer Jonathan Aguilar, “is how to manage the water I have and what kind of feedback I should look at in order to make that decision.”

Aguilar, whose office is located in the Southwest Research-Extension office in Garden City, works in a region that receives as little as 18 inches of rainfall per year, or about half that received in the eastern part of Kansas. Many crop fields in western Kansas are fed by water farmers are able to draw from the large underground resource known familiarly as the Ogallala Aquifer.

Yet, as the mighty Ogallala dries up, farmers are challenged to figure out how to most efficiently use what they’re legally entitled to, and still grow healthy crops. Aguilar spoke recently on that topic during a recent precision agriculture conference in Manhattan.

“What I told people is that there are only three general categories of feedback that producers should use when determining when and how much to irrigate,” Aguilar said. “They can base their decision on weather, soil or on the plant itself.”

Only half-jokingly, he added: “Never, never base it on your neighbor.”

“Because there are still farmers that base irrigation decisions on what their neighbor is doing,” he said.
Aguilar said that infrared thermometers and dendrometers are two technologies that are being tested by agricultural scientists to help producers receive feedback from their crops. Both are intended to measure stress on the plant, indicating a need for the farmer to schedule irrigation.

Feedback on Kansas weather is available 24 hours a day from the Kansas Mesonet, located at Kansas State University. The statewide network of weather stations collects data on evapotranspiration, as well as other related weather benchmarks.

Aguilar called soil moisture sensors “a really aggressive market, and I think there is value in using them. They are really user-friendly for farmers; with a subscription, it allows you to access information on soil moisture on their phone.”

“In terms of technology, being able to use that data almost instantly is very impressive.”

While soil moisture sensors are highly-favored for their ease of use and reliability, Aguilar cautioned that they’re not always going to give producers a correct reading. One sensor in one part of the field may not be representative of the entire field, and if a sensor is not installed properly, it could give a false reading.

To illustrate, Aguilar pulls out a tennis ball.

“Think of this tennis ball as a volume of soil that you are going to measure in relation to a field that is 125 acres,” he said. “You get a reading, and then you are going to make a decision out of that tennis ball volume for the big field. That said, you better install your sensor correctly and you better make sure that the sensor is giving you the exact number for the particular sample in the field.”

To aid in producer’s decisions, Aguilar said Kansas State University continues to develop and improve upon a computer software program commonly known as KanSched. The program is designed to monitor the root zone soil profile water balance and schedule irrigation events on a field using evapotranspiration data. KanSched can also be used to monitor the soil profile water content of non-irrigated fields.

“Technology is part of management, but management techniques are a big help already in reducing water use,” Aguilar said. “Many farmers, if they had a chance, would turn the water on and let it run most days and most of the time. But now they are more mindful of when to turn it on and when to turn it off. They are looking at their systems more intently than they have before. And they have learned a lot.”

More information on irrigation scheduling and new technologies is available at local extension offices in Kansas, or interested persons may also contact Aguilar at jaguilar@ksu.edu.

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FOR PRINT PUBLICATIONS: Links used in this story
K-State Southwest Research-Extension Center (Garden City), http://www.southwest.k-state.edu/index.html
Kansas Mesonet, http://mesonet.k-state.edu

KanSched (irrigation scheduling tool), https://milab.ksu.edu

K-State Research and Extension statewide offices, https://www.ksre.k-state.edu/about/statewide-locations.html

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