



## Irrigation sensors benefit Afghanistan farmers

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10/14/2006 - **BAGRAM AIRFIELD, Afghanistan** -- Afghan agriculture took a huge step forward as new irrigation sensors were introduced to agricultural officials in Kapisa Oct. 12 at the provincial governor's compound in Mahmud Raqi.

The introduction of the sensors is part of a 20-week agriculture course taught by Dr. Michael Gangwer, a Department of Agriculture soil scientist assigned to the Air Force-led Bagram Provincial Reconstruction Team.

The Watermark Soil Moisture Sensors, developed in 1985, will help local farmers, beginning with the Parwan, Kapisa and Panjshir provinces, determine when and where to irrigate their fields, a process that will allow them to use their limited water resources more wisely and effectively, said Dr. Gangwer.



Dr. Michael Gangwer demonstrates how to properly connect and use the Watermark Soil Moisture Sensor to the Kapisa Province agriculture minister at the provincial governor's compound Oct. 12. The sensors are being used for the first time in Afghanistan and will greatly aid the Afghan agriculture community in determining when and where to irrigate their crop fields. (U.S. Air Force photo/Tech. Sgt. Joseph Kapinos)

"The Afghan people have access to water for most of the growing season, but getting that water to the crop fields can be somewhat problematic," said Dr. Gangwer.

"This country's irrigation infrastructure is not well developed, but the areas where it is, better utilization of this valuable resource would help farmers schedule the proper timing and volume of water use, which will then allow them to use the remaining water on fields that don't have irrigation capability," said Dr. Gangwer.

"This would be a significant improvement over the current model, where they over-irrigate some fields and simply run out of water for the others," he added.

Implementation of the sensors is a rather simple task of installing it in the ground at a depth equal to the crops roots. Using a hand-held device similar to an ohmmeter, a small electric current is sent down one of two wires connected to the sensor and then the current is sent back to the device via the second wire. The device then measures the loss or resistance of the current, telling the farmer whether the soil below is moist or dry. The drier the soil, the less current is returned to the ohmmeter, said Dr. Gangwer.

Using these data and knowing the dryness of the soil, the Afghan farmer can know how often and when to irrigate his field, a definite progression for the Afghan agriculture community, said Dr. Gangwer.

"The bottom line is that by taking direct measurements instead of guessing when water should be applied, irrigation efficiency is improved," said Dr. Gangwer. "This is truly significant, because agriculture is a huge part of the economy in Kapisa, as with the rest of Afghanistan."

Dr. Gangwer, who received his doctorate in agricultural systems science with a specialty in soil physics from Michigan State University in 2005, said that he used these types of sensors to derive his data for his doctoral thesis. He is intimately familiar with these devices and is excited to be bringing this level of technology to the people of Afghanistan.

"Since I am so comfortable with this equipment, I thought bringing this technology to Afghanistan would be a good first step for farmers," said Dr. Gangwer.

Working in this largely dry and mountainous country presents a large number of challenges both for the farmer and PRT. Getting to the areas where this type of information is vital can be difficult, as well as the language barriers that are always present, said Dr. Gangwer. That is why having these classes at regional centers, such as the governor's compound is important. It brings both students and teacher together, he said.

"These have been good lectures," said Abdul Azim Rafiq, a manager who is attending the agriculture lessons. "We are happy to be getting the opportunity to improve our agriculture. This is the first time we have seen this type of technology."

Working with the people of Afghanistan, the PRT has made it their mission to bring these new ideas to the people and improve their way of life. Each farmer who can expand his ability to effectively bring crops to the market not only improves his family's well-being, but also helps rebuild the country's economy.

"It is truly great that the PRT does offer these types of classes. Agriculture is the backbone of Afghan industry and commerce," said Mr. Rafiq. "We are very excited about this technology."

"This will mean a great deal to the future of Afghanistan," he added.