Crops watering by phone

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Thanks to a new app, smart phones could help monitor irrigation water use according to need. This could ensure that food is available on our table is the produced in a sustainable way.

In Europe, irrigated agriculture is the chief water consumer for food production. Yet water resources are in limited supply. One way out of this problem is to take more care with the water we use, and reduce the estimated 60% water waste. Now, a phone app supplies farmers' water thirsty crops with the right amounts of water at the right times, referred to in the field as irrigation scheduling.

An EU funded project, called WaterBee, is putting the system through its pace with a variety of crops in countries as far apart as Estonia, Italy, Spain and the UK. Its app gathers data remotely via sensors in the farmer's field. The state of play is then crunched by maths equations, which relay back to the app how much water should be released by the sprinkler systems.

The problem is that inefficient water irrigation wastes a great deal of water. "About 70% of the water withdrawn from rivers and ground water by humans is for agriculture," Andrew Thompson, a plant scientist at Cranfield University, UK, tells youris.com. He is working to save water using maths, technology and farming intelligence. The plan is to achieve water savings of 40% while improving crop quality too.

To do so, "the goal is to add just the right amount of water using mathematical models. Too much water and it is going to drain out from the soil; too little and your crop yields go down and you have problems with crop quality," Thompson adds.

"The model divides up the soil into layers and then uses calculations for the transfer of water between layers," Thompson says. It takes into account details of the soil, irrigation system, crop, roots and likely yields. The system makes irrigation recommendations based upon soil-moisture and weather data delivered via wireless technology to a computer server. It checks how well the simulated field matches reality and makes adjustments to bring the virtual closer to farm reality. "The main thing you need is mobile network coverage and it can work anywhere in the world really," Thompson explains, who sees potential in Europe, South America and China in particular.

This is "not the first such system in terms of internet irrigation management data and tools, but it does appear that it also integrates system control, which tends to be the last piece of the puzzle," Garry

Grabo, tells youris.com, based on his expertise as an irrigation engineer at North Carolina State University, USA. He adds: "Systems such as these hold promise to apply emerging technologies for the purpose of more accurate irrigation scheduling. Additional benefits may include reduced irrigation, labour and energy savings."

"Irrigation scheduling is very important," agrees John Norman, soil scientist at the University of Wisconsin, Madison, USA, adding: "But if such scheduling requires much from the farm manager, it is not likely to be sustained. Sensors in the ground are not viewed positively by farmers because they represent obstructions in the field, have questionable accuracy and require maintenance."

But Norman also believes "the greatest impediment to implementing these models is inadequate soil information," which require maps of soil properties such as texture, structure, organic matter and bed rock. He has "serious reservations that the high-tech WaterBee approach does not adequately address inherent soil heterogeneity issues." These soil complications can impact accuracy and reliability when you are making predictions. Detailed soil maps help, but they are expensive. "Soil mapping would improve the placement of sensors and would inform the irrigation recommendation," concurs Thompson. "However, use of many sensors in a network followed by data averaging also addresses this difficult issue."

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