

WaterSeeker, a Variable-Rate Irrigation Using Wireless Solar Sensors

The purpose of this system is to maximize agricultural water use efficiency in regions with ephemeral precipitation, using a low-cost, variable-rate, automatic irrigation system.

With increasing population, one of the greatest challenges is growing more food with less water. Erratic rainfall, drought, flooding, and other uncertainties seriously impact crop production system in the under developed nations. There is a need for energy efficient, need-based irrigation technology that monitors antecedent soil water content and minimizes the cost of pumping water into the fields.

WaterSeeker is a new energy efficient, need-based water management technique targeted towards medium and small-scale farmers. It utilizes geospatial technique and operates with assembly of solar powered wireless sensor network with probes. The system collects the soil temperature and moisture information and calculates irrigation requirement. WaterSeeker ensures delivery of irrigation water in optimum amounts for fields. Installing more WaterSeekers in field will ensure more details in the soil water level variability captured. Variable rate irrigation is applied which maximizes water use efficiency.

The system is also capable of transmitting data to the user (farmer) for remote monitoring and control via Short Messaging Service (SMS) and notifies farmers about current soil moisture level in fields. Users can override the automated irrigation system using a mobile device. Rainwater harvesting during monsoon in reservoirs is used as a source of water for irrigation during rest of the year. Gravity flow method utilized in this system reduces the cost of pumping. This technology along with other best management practices may help to overcome the current water scarcity in the predominantly rainfed agriculture.

