

# Evaluation of Irrigation Scheduling Using Real Time Soil Moisture Monitoring System

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Date : 15<sup>th</sup> April, 2015

## Abstract

Large cultivated area in Pakistan is irrigated by canal irrigation system and it diverts 80%-90% of water. Growing population demands efficient use of water. Water is not a scarce commodity, but its unplanned use may lead ultimately to water shortage. A greater challenge world may face is increased crop production with limited water resources. Moreover the establishment of large schemes may take time with huge costs. Therefore it impresses on the need of efficient use of agricultural water on small irrigated areas and farms. The study is initiative on the development of experimental set-up for irrigation water management under the guidelines of Food and Agriculture Organization (FAO). The research focuses on standard method as given by FAO for crop evapotranspiration estimation, supplemental irrigation water volume by water budget method and soil moisture monitoring with real time soil moisture monitoring system. Irrigation scheduling is a technique that is used to estimate required irrigation depth and interval on the basis of meteorological data and adjusted with soil moisture measurement taken in the field. Irrigation scheduling based on soil moisture can be an effective way for maximizing water use efficiency and to increase agricultural output. The experimental site contains desired crops watered under furrow irrigation system to study soil-plant-water-atmosphere parameters necessary for irrigation decision making. A real time soil moisture monitoring system contains Time Domain Reflectometer (TDR) with sensors on the site for daily soil moisture measurement. The FAO-56 Penman Monteith method, which has been widely accepted as a standard method, is used to estimate consumptive water requirements (evapotranspiration) of selected plants for local climate. Water balance approach is used to estimate water deficit in the root zone of plants. Optimum irrigation schedule is developed, implemented and evaluated. Experimental results will be used to simulate the impact of irrigation scheduling on water conservation.

Keywords: evapotranspiration, irrigation scheduling, water conservation