

COMPARISON OF MULTI-SENSOR CAPACITANCE AND TDR SOIL MOISTURE MEASUREMENT METHODS IN TEXAS SOUTH PLAINS IRRIGATED COTTON**Scott Jordan****Dana Porter****Texas A&M AgriLife Research and Extension Service****Lubbock-Halfway, Texas****James Bordovsky****Texas A&M AgriLife Research****Halfway, Texas****Abstract**

As the Ogallala Aquifer continues to decline, growers face the challenge of maintaining production while conserving available irrigation water resources. One approach to making water management decisions is incorporating sensor-based technologies; however the use of these technologies in the Texas South Plains is limited. The objective of this project was to compare commercially available soil moisture sensors and evaluate their potential for irrigation management decisions in limited water environments. Capacitance and Time Domain Reflectometry (TDR) sensors were installed in several treatment plots within a cotton irrigation management study conducted at the Texas A&M AgriLife Research Center in Halfway, Texas during the 2016 growing season. Two similar capacitance type sensors, installed in the same irrigation treatment plot, resulted in differences in soil water content measured by the paired sensors. This resulted in questions regarding the sensor accuracy, sensor installation, and variation in soils. The comparison of capacitance sensors to TDR sensors indicated that both sensor types measured the overall soil moisture trends occurring during the growing season; however, the magnitude of soil water changes following some wetting events was different. Initial results indicated that capacitance sensors, under the same treatment conditions, do not always return the same results. Capacitance and TDR sensors both responded to irrigation and rainfall events, with overall resulting soil water trends being similar up to depths of 36". Preliminary results indicate that there is a potential for sensor-based irrigation management strategies in the Texas South Plains, although additional evaluations are needed.