USING FIELDPRINT CALCULATOR TO DEMONSTRATE THE EFFECT OF COTTON IRRIGATION MANAGEMENT ON FACTORS OF SUSTAINABILITY T. Grant B. Leib L. Duncan The University of Tennessee Knoxville, TN F. Liangshan Liaoning Academy of Agricultural Sciences Shenyang, China

Abstract

Cotton irrigation can be attractive to a producer through the lens of improved agronomic productivity and potential economic benefit. On a larger scale, we should also be mindful of the sustainability of irrigated cotton production as it relates to water use efficiency, greenhouse gas emissions, and energy consumption. Our objective is to gauge the impact of various irrigation management schemes and various soil types on these sustainability factors. Using the Fieldprint Calculator, we have analyzed 5 years of cotton irrigation trials across various textured soils. While most production inputs are held constant, soil characteristics, water input, and resulting yields are modified. The Fieldprint Calculator results show distinct differences between sustainability outcomes depending on soil type and irrigation. In general, sustainability can be much improved in sandy soils with irrigation, while in silt loam soils it becomes much more important to irrigate appropriately without over-irrigating. Also, in wetter years it is more important to apply appropriate irrigation than in drier years, where irrigation in general is beneficial to factors of sustainability. We also will apply the Fieldprint Calculator to results from a producer field this growing season. In this producer's field, we have implemented a simple variable rate irrigation scheme. Sandy areas have been separated from silty areas, and irrigation was tailored to each zone based on their own conditions. In extending this research to a producer field, we hope to demonstrate its real-world applicability.