## SUSTAINABILITY AND PROFITABILITY OF COTTON

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## **Abstract**

Producers are continuously focusing on adjustments that can be made to increase profitability. One strategy to improve profitability is through increasing input efficiency. As producers improve efficiency, a positive impact is often observed in regards to sustainability. The supply chain is very interested in becoming more sustainable. When producers reduce tillage, or convert to a no-till production system with an established cover crop both sustainability and profitability are impacted. The objective of this study to evaluate the impact of no-till with cover crops on sustainability and profitability. The University of Arkansas Cotton Research Verification/Sustainability Program conducted research along with Discovery Farms in two of the five fields in 2016. A unique situation occurred at Discovery farms in Southeast Arkansas which allowed for observation where fields are composed of two irrigation sets allowing for evaluation of farmer standard practices, till/no-cover to that of a modified production system notill/cover. The above comparisons were also made at both the Mississippi and St. Francis county locations with the difference being that fields are not composed of two irrigation sets. All fields were monitored for inputs and entered into the Fieldprint Calculator. Utilization of the calculator assists producers by making estimates over five calculated sustainability metrics: land use, soil conservation, irrigation water use, energy use, and greenhouse gas emissions. Throughout the study all of the producers' inputs were recorded, providing the information needed to calculate both fixed and variable cost. In Arkansas, it is unlikely to be able to farm in a completely no-till situation, so each of our no-till fields were almost no-till as a FurrowRunner was used to make a very narrow trench leaving the cover crop residue as undisturbed as possible. Soil compaction was consistently lower, and soil moisture was consistently higher in no-till/cover throughout the growing season. Water moved slower down the row in no-till/cover as water worked through the stubble. The above factors are believed to have played a major role in no-till/cover producing a higher yield than till/no-cover in fields with two or more years of an established cover crop. Yield was 1175 pounds lint per acre in no-till/cover, and 1125 pounds lint per acre in till/no-cover. No-till with cover was approximately \$0.06 per pound cheaper to produce than till/ no-cover. Overall sustainability improved using no-till/cover compared to the farmer standard as measured by the calculator. Additional research is needed to further evaluate how sustainability and profitability are related.