EVALUATION OF PROFITABILITY AS INFLUENCED BY PRACTICES TO IMPROVE IRRIGATION EFFICIENCY OF COTTON IN ARKANSAS

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Abstract

Producers are often skeptical about converting to cover crops, having concern about irrigation efficiency and costs associated with adopting new technology. Research was conducted along with Discovery Farms in Southeast Arkansas. Discovery Farms main focus is edge of field water quality. Runoff ditches from trapezoidal flumes split field in half, allowing research to be conducted for standard practice till no cover, and no-till with cover. The objective was to determine if no-till with cover would increase irrigation efficiency and profitability. Research was conducted in ShopCot and Weaver fields in 2015. During field visits farm operations were recorded including tractor size, equipment used, and products applied giving information needed to calculate both fixed and variable cost. Irrigation efficiency was tracked through the use of soil penetrometers which measure soil compaction, readings were measured at the depths of three and six inches during field visits. Irrigation water flow down rows was determined through use of button loggers placed at three different intervals throughout furrows prior to every irrigation. Amount of water applied to fields during irrigation events was determined by flow meters, and through trapezoidal flumes runoff was measured. Fields were entered into Fieldprint Calculator, which is a relatively new tool created by the Field to Market: The Alliance for Sustainable Agriculture. Fieldprint calculator makes estimates over seven sustainability factors: land use, soil carbon, soil conservation, irrigation water use, and greenhouse gas emissions, energy use and water quality. Fieldprint Calculator estimates your fields' performance and compares results to national and state averages. Taking land use, irrigation water use, energy use, and greenhouse gas index into consideration we calculated the percentage Fieldprint was of national average. Weaver No-till with cover was 49% , Weaver till no cover 67%, ShopCot no-till cover 47.5%, and Shop till no cover 63.5% of national average. Research showed soil compaction is consistently lower in no-till with cover, water flow rates down rows was 6.7 percent faster in tillage no cover. Field footprint shrunk when changing from till-no cover to no-till with cover. Production costs were slightly higher in no-till with cover in ShopCot field mainly due to seed costs of cover crop, as applications of herbicides and insecticides were basically the same. Weaver till no cover had one additional application of an herbicide which made till no cover slightly more expensive. No-till with cover produced a higher yield across both fields, hence operating expenses $/lb., was cheaper than till no cover. No-till with cover was in its first season on Weaver field, and fourth season on ShopCot which is demonstrating continuous improvement.

	Weaver No-till / Cover	Weaver Till/No Cover	ShopCot No-till/ Cover	ShopCot Till/ No Cover
Yield	1107	965	1265	1057
Operating Expenses	544.20	557.38	604.80	594.60
Operating Expenses/lb.	.49	.58	.48	.56