



DIVISION OF AGRICULTURE
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University of Arkansas System

Cotton Research Verification Program
2015 Annual Report



Cotton
Incorporated

Arkansas

ROW CROP VERIFICATION



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Cotton Research Verification / Sustainability Program – 2015 Progress Report

Amanda Free, Bill Robertson and Archie Flanders.¹

Abstract

The Cotton Research Verification / Sustainability Program works with producers in an effort to increase efficiency hence becoming more sustainable in an effort to improve profitability. As costs of production continues to increase producers are looking for ways to produce cotton more efficiently. The program seeks to accomplish many goals. The primary goal is to demonstrate to producers that the University of Arkansas cotton recommendations developed from small-plot research are applicable to field scale operation and provide optimum yields and economic returns. The Cotton Research Verification / Sustainability Program expands beyond that of the traditional verification program by measuring the producers' environmental footprint for each field and evaluating the connection between profitability and sustainability.

Introduction

The University of Arkansas, Division of Agriculture has been conducting the Cotton Research Verification Program (CRVP) since 1980. This is an interdisciplinary effort in which recommended best management practices and production technologies are applied in a timely manner to a specific farm field. Since the inception of the CRVP in 1980, there have been 269 irrigated fields entered into the program. The success of the cotton program spawned verification programs in rice, soybeans, wheat and corn in Arkansas and other states in the Mid-South.

Procedures

Eight fields at two locations comprised the Cotton Research Verification / Sustainability Program locations in 2015. Each field was entered into the Field to Market Fieldprint Calculator. Sustainability metrics from the 2015 season will help serve to establish a benchmark for successive years as sustainability efforts will be a major part of the program for 2016.

The Cotton Research Verification / Sustainability Program worked along with Discovery Farms in Southeast Arkansas on 5 of the 8 fields in the program. Discovery farms main focus is to monitor edge of field water quality. Fields are watered in two sets. The split field arrangement provides the opportunity to compare two production strategies. The farmer standard tillage and cover crop usage was compared to a no-till system with a cereal rye cover crop. The remaining three fields had no cover crop planted in 2015. Irrigation methods was composed of either furrow or pivot irrigation on the eight fields. This program was conducted under various farmers' standard tillage systems, irrigation

¹ Cotton Research Verification/ Sustainability Program Coordinator, University of Arkansas Cooperative Extension Service, Newport; Cotton Extension Agronomist, University of Arkansas Cooperative Extension Service, Newport; Extension Economist, Northeast Research and Extension Center, Keiser, respectively.

regimes, soil types and environmental conditions. The diversity of fields in the program reflected cotton production in Arkansas.

Field records were maintained and economic analyses were conducted at seasons end to determine net return/A for each field in the program. All fields were also entered into Fieldprint Calculator, to evaluate fields' environmental footprint.

Results and Discussion

The 2015 growing season began with a wetter than normal April and May, which delayed planting across the state. First cotton was planted in Arkansas around May 1st. The vast majority of the crop in the state was planted the first half of May. However, many producers who had planned to plant cotton were unable to get cotton in the ground due to rainfall that occurred during the favorable planting window. Plant bug numbers were moderate this year, fields in the Verification/ Sustainability program were treated an average of 3.1 times for plant bugs. Each field had an average of 1.9 burndowns, and 2.9 herbicide applications for the 2015 season. Two of the eight verification fields had one treatment for worms. Average costs for herbicides and insecticides were \$57.14 and \$33.41 respectively. Pest control represents a significant expense and can impact yield greatly. Insecticides, herbicides, and plant growth regulators represented 26% of the producers input costs. Planting seed with technology fees are 24% and fertilizers are 28% of input costs. All energy costs including diesel fuel for tillage, irrigation, and harvest represented 13% of input costs. These items represent approximately 91% of the producers input costs to grow the crop.

Records of field operations on each field provide the basis for estimating expenses. Production data from the 8 fields were applied to determine costs and returns above operating costs, as well as total specified costs. Operating costs and total costs per pound indicate the commodity price needed to meet each costs type. Operating costs, total costs, costs per pound, and returns are presented in Table 1. Costs in this report do not include land costs, management, or other expenses and fees not associated with production. Budget summaries for cotton are in Table 2. Price received for cotton of \$0.65/lb. is the estimated Arkansas annual average for the 2015 production year. Average cotton yield for all verification field is 1182.6 lb. per acre. Value of cottonseed is set equal to total post-harvest expenses for each field.

Average operating costs for cotton in Table 1 and Table 2 are \$539.99 per acre. Table 2 indicates that fertilizer and nutrient costs average 23% of operating expenses and are \$126.84/acre. Chemicals average \$117.80/acre, and are 22% of the operating expenses. Seed and associated technology fees average \$109.76/acre, 20% of operating expenses, and include two fields planted with a cover crop.

With yield average of 1182.6 lb. per acre, average operating costs are \$0.46/lb. in Table 1. Operating costs range from a low of \$503.62 in the Weaver (No-till with cover crop), to a high of \$582.69 in the Shop (No-Till with cover crop). Returns to operating costs average \$228.71 per acre. The range is from a low of \$108.04 in the Weaver (farmer

standard) to a high of \$383.17 in the St. Francis Conders Field. Average fixed costs are \$152.46. Which leads to average total costs of \$692.46 per acre. The average returns to total specified costs is \$76.24 per acre. The low is -\$54.12 in the Shop (farmer standard), and the high is \$236.51 in the St. Francis Conders field. Total specified costs average \$0.60/lb.

Practical Applications

This program has become a vital tool in the educational efforts of the University of Arkansas. It continues to serve a broad base of clientele including cotton growers, consultants, researchers, and county extension agents. The program strives to obtain its goals and provide timely information to the Arkansas cotton community.

Acknowledgements

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Table 1. Operating Costs, Total Costs, and Returns for Cotton Research Verification Program, 2015

Field	Operating Costs	Operating Costs per lb	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs per lb
Weaver (Farmer Standard)	518.95	0.54	108.04	157.60	676.54	-49.55	0.70
Weaver (No-Till/Cover Crop)	503.62	0.45	215.99	151.05	654.67	64.94	0.59
Shop (No-Till/Cover Crop)	582.69	0.46	239.53	157.89	740.58	81.65	0.59
Shop (Farmer Standard)	576.39	0.55	110.89	165.00	741.40	-54.12	0.70
Desha Homeplace	565.81	0.41	336.59	155.97	721.77	180.62	0.52
St. Francis Conders	528.13	0.38	383.17	146.66	674.79	236.51	0.48
St. Francis Norris	506.45	0.50	146.46	146.66	653.11	-0.20	0.65
St. Francis Westside	537.90	0.42	289.00	138.89	676.79	150.11	0.53
Average	539.99	0.46	228.71	152.46	692.46	76.24	0.60

Table 2. Summary of Revenue and Expenses per Acre for Cotton Research Verification Program, 2015.

Revenue/Expenses	Field								Average
	Weaver (Farmer Standard)	Weaver (No-Till/ Cover Crop)	Shop (No-Till/ Cover Crop)	Shop (Farmer Standard)	Desha Homeplace	St. Francis Conders	St. Francis Norris	St. Francis Westside	
Revenue									
Yield (lb.)	964.6	1107.1	1265.0	1057.4	1388.3	1402.0	1004.5	1272.2	1182.6
Price (\$/lb.)	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Total Crop Revenue	626.99	719.62	822.22	687.28	902.40	911.30	652.91	826.90	768.70
Cottonseed Value	116.38	133.57	152.62	127.57	167.50	169.15	121.19	153.49	142.68
Expenses									
Seed	98.67	108.87	108.87	98.67	98.67	121.44	121.44	121.44	109.76
Fertilizers & Nutrients	82.16	80.60	131.24	131.24	131.24	153.27	153.27	151.68	126.84
Herbicides	63.06	44.68	61.80	61.80	81.50	56.98	44.50	42.78	57.14
Insecticides	51.19	51.19	35.27	35.27	35.27	13.35	13.35	32.38	33.41
Other Chemicals	25.30	25.30	25.30	25.30	25.30	30.50	30.50	30.50	27.25
Custom Applications	35.00	35.00	42.00	42.00	35.00	6.00	6.00	6.00	25.88
Other Inputs	3.45	3.45	3.45	3.45	3.45	30.68	21.98	31.28	12.65
Diesel Fuel	33.45	30.80	31.11	33.34	33.11	23.32	23.32	27.70	29.52
Irrigation Energy Costs	31.87	31.55	48.01	48.01	27.89	11.20	11.20	9.34	27.38
Input Costs	424.16	411.44	487.05	479.08	471.42	446.73	425.56	453.11	449.82
Fees	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Repairs & Maintenance ¹	40.67	39.43	40.82	41.98	39.80	38.96	38.96	38.92	39.94
Labor, Field Activities	24.08	23.07	23.31	23.96	23.46	12.19	12.19	15.39	19.71
Production Expenses	506.91	491.94	569.17	563.02	552.68	515.88	494.70	525.42	527.47
Interest	12.04	11.68	13.52	13.37	13.13	12.25	11.75	12.48	12.53
Post-harvest Expenses	116.38	133.57	152.62	127.57	167.50	169.15	121.19	153.49	142.68
Operating Expenses	518.95	503.62	582.69	576.39	565.81	528.13	506.45	537.90	539.99
Returns to Operating Expenses	108.04	215.99	239.53	110.89	336.59	383.17	146.46	289.00	228.71
Capital Recovery & Fixed Costs	157.60	151.05	157.89	165.00	155.97	146.66	146.66	138.89	152.46
Total Specified Expenses ²	676.54	654.67	740.58	741.40	721.77	674.79	653.11	676.79	692.46
Returns to Specified Expenses	-49.55	64.94	81.65	-54.12	180.62	236.51	-0.20	150.11	76.24
Operating Expenses/lb.	0.54	0.45	0.46	0.55	0.41	0.38	0.50	0.42	0.46
Total Expenses/lb.	0.70	0.59	0.59	0.70	0.52	0.48	0.65	0.53	0.60

¹Includes employee labor allocated to repairs and maintenance.

²Does not include land costs, management, or other expenses and fees not associated with production.