



DIVISION OF AGRICULTURE
RESEARCH & EXTENSION

University of Arkansas System

Cotton Research Verification Program

2016 Annual Report



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Arkansas

ROW CROP VERIFICATION



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Cotton Research Verification Sustainability Program- 2016 Economic Report

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Abstract

The Cotton Research Verification Sustainability Program (CRVSP) works with producers to produce cotton more efficiently with the objective of improving profitability. A continuing increase in the cost of production, and decreasing cotton prices have resulted in a decrease in cotton acres over the last 10 years. For cotton to continue being a viable commodity, profitability must be improved.

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 283 irrigated fields entered into the program. The success of the cotton program spawned verification programs in rice, soybean, wheat and corn in Arkansas and in other Mid-South states. In 2014, the CRVP became known as the CRVSP. The CRVSP 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.

Procedures

The 2016 CRVSP was comprised of 14 fields at three locations i, with eight fields being in Desha County, two fields in Mississippi County, and four fields in St. Francis County. Each field was entered into the Field to Market Fieldprint Calculator. Two fields entered second year of research regarding Farmer Standard with stale seedbed compared to that of a modified production system no-till with cover. Increasing both efficiency and profitability will continue to be a major part of the program in 2017.

The CRVSP has worked along with Discovery Farms in Southeast Arkansas on six of the 14 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 farmers' standard tillage and cover crop usage was compared to a no-till system with a cereal rye cover crop. The fields at the Mississippi and St. Francis County locations did not have the opportunity to be watered in two sets. In fall 2015, all no-till with cover fields had Elbon cereal rye broadcasted, with a targeted seeding rate of 56 lb/A. The remaining two fields had no established cover crops in 2016. Irrigation methods was composed of either furrow or pivot irrigation at all locations. This program was conducted under various farmers' standard tillage treatments, irrigation regimes, soil types and environmental conditions. The diversity of the fields in the program reflect cotton production in Arkansas. Field records were

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maintained and economic analyses were conducted at seasons end to determine net return/A for each field in the program.

Results and Discussion

The majority of the cotton in Arkansas was planted from late April-mid May. Plant bug numbers decreased this year compared to 2015, fields in the CRVSP were treated an average of 2.3 times for plant bugs. A slightly higher plant bug pressure occurred in St. Francis County in 2016 compared to other fields in this study. Each field had an average of 1.3 burndowns, and 1.9 herbicide applications for the 2016 season. All fields except for Manila had an average of 1.7 treatments for moths/worms. Average costs for herbicides and insecticides were \$82.56 and \$38.60, respectively. Pest control represents a significant expense and can impact yield greatly.

Records of field operations on each field provided the basis for estimating expenses. Production data from the 14 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 presented in Table 2. Price received for cotton of \$0.74/lb is the estimated Arkansas annual average for the 2016 production year and includes a \$0.05/lb premium for cottonseed value after deducting all post-harvest expenses. Average cotton yield for all verification fields was 1,159 lb/A. Value of cottonseed was set equal to total post-harvest expenses for each field with a \$0.05/lb net premium.

Average operating costs for cotton in Table 1 and Table 2 were \$512.31 per acre. Table 2 indicates that chemicals averaged \$151.16/acre and were 30% of operating expenses. Seed and associated technology fees averaged \$127.00/acre, or 25% of operating expenses and included six fields planted with a cover crop. Fertilizer and nutrient costs averaged 17% of operating expenses and were \$86.08/acre.

With average yield of 1,159 lb/A, average operating costs were \$0.45/lb. in Table 1. Operating costs ranged from a low of \$450.96 in the Manila North field to a high of \$551.01 in the Grain Bin West field. Returns to operating costs averaged \$345.51 per acre. The range was from a low of \$200.90 in the Wellcot field to a high of \$456.64 in the St. Francis South field. Average fixed costs were \$150.12 which led to average total costs of \$662.43 per acre. The average returns to total specified costs are \$195.39 per acre. The low was \$42.11 in the Shop North field, and the high was \$307.56 in the Conders South field. Total specified costs averaged \$0.58/lb.

Practical Application

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 commodity.

Acknowledgements

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Table 1. Operating Costs, Total Costs, and Returns for 2016 CRVSP fields.

Field	Operating Costs	Operating Costs per lb	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs per lb
Shop North	523.95	0.53	201.99	159.88	683.83	42.11	0.70
Shop South	538.26	0.50	257.98	141.70	679.96	116.28	0.63
Weaver North	506.57	0.40	431.75	158.70	665.27	273.05	0.52
Weaver South	524.67	0.41	417.35	136.49	661.17	280.85	0.52
Homeplace	531.53	0.49	278.77	160.63	692.17	118.13	0.63
Grain Bin East	527.58	0.43	372.26	136.51	664.10	235.74	0.55
Grain Bin West	551.01	0.42	409.51	154.05	705.06	255.46	0.54
Wellcot	459.92	0.52	200.90	147.65	607.57	53.25	0.68
Manila South	466.40	0.42	349.82	154.96	621.36	194.86	0.56
Manila North	450.96	0.40	392.64	170.29	621.25	222.35	0.54
Conders North	529.64	0.44	370.94	138.02	667.66	232.92	0.55
Conders South	512.76	0.39	456.64	149.07	661.83	307.56	0.51
Causey West	538.23	0.45	340.89	151.66	689.89	189.23	0.58
Causey East	510.80	0.44	355.74	142.11	652.91	213.63	0.56
Average	512.31	0.45	345.51	150.12	662.43	195.39	0.58

¹Returns include cottonseed value equal to post-harvest expenses with a \$0.05/lb. premium added to lint price.

Table 2. Summary of Revenue and Expenses per Acre for 2016 CRVSP fields.

Revenue/Expenses	Field							
	Shop North	Shop South	Weaver North	Weaver South	Homeplace	Grain Bin East	Grain Bin West	Wellcot
Revenue								
Yield (lb.)	981	1,076	1,268	1,273	1,095	1,216	1,298	893
Price ¹ (\$/lb.)	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Total Crop Revenue	725.94	796.24	938.32	942.02	810.30	899.84	960.52	660.82
Cottonseed Value ¹	128.17	140.58	165.66	166.32	143.06	158.87	169.58	116.67
Expenses								
Seed	116.22	137.22	115.21	127.78	118.02	130.59	109.59	109.59
Fertilizers & Nutrients	82.84	82.84	74.29	82.84	82.84	82.84	82.84	82.84
Herbicides	112.29	112.29	106.29	106.29	92.82	106.28	118.66	58.73
Insecticides	38.06	38.06	38.06	38.06	52.71	38.06	61.84	32.30
Other Chemicals	27.34	27.34	27.34	27.34	29.60	27.34	27.34	28.08
Custom Applications	35.00	35.00	35.00	42.00	42.00	42.00	42.00	42.00
Other Inputs	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Diesel Fuel	14.38	12.08	14.58	11.52	14.90	11.52	14.25	13.61
Irrigation Energy Costs	8.76	8.05	7.28	5.43	8.84	5.46	6.57	7.34
Input Costs	438.37	456.37	421.54	444.75	445.23	447.58	466.58	377.99
Fees	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Repairs & Maintenance ²	29.03	26.95	28.76	26.06	29.28	26.06	27.80	27.69
Labor, Field Activities	22.40	20.44	22.52	19.69	22.70	19.70	21.84	21.58
Production Expenses	511.80	525.77	494.82	512.50	519.20	515.34	538.22	449.25
Interest	12.16	12.49	11.75	12.17	12.33	12.24	12.78	10.67
Post-harvest Expenses	128.17	140.58	165.66	166.32	143.06	158.87	169.58	116.67
Operating Expenses	523.95	538.26	506.57	524.67	531.53	527.58	551.01	459.92
Returns to Operating Expenses	201.99	257.98	431.75	417.35	278.77	372.26	409.51	200.90
Capital Recovery & Fixed Costs	159.88	141.70	158.70	136.49	160.63	136.51	154.05	147.65
Total Specified Expenses³	683.83	679.96	665.27	661.17	692.17	664.10	705.06	607.57
Returns to Specified Expenses	42.11	116.28	273.05	280.85	118.13	235.74	255.46	53.25
Operating Expenses/lb.	0.53	0.50	0.40	0.41	0.49	0.43	0.42	0.52
Total Expenses/lb.	0.70	0.63	0.52	0.52	0.63	0.55	0.54	0.68

¹Price includes cottonseed value equal to post-harvest expenses with a \$0.05/lb. premium added to lint price.

²Includes employee labor allocated to repairs and maintenance.

³Does not include land costs, management, or other expenses and fees not associated with production.

Table 2. Summary of Revenue and Expenses per Acre for 2016 CRVSP fields comparing farmer standard (FS) with or without cover crop (CC) to no-till (NT) with or without cover crop (CC) (right continuation).

Revenue/Expenses	Field						Average
	Manila South	Manila North	Conders North	Conders South	Causey West	Causey East	
Revenue							
Yield (lb.)	1,103	1,140	1,217	1,310	1,188	1,171	1,159
Price ¹ (\$/lb.)	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Total Crop Revenue	816.22	843.60	900.58	969.40	879.12	866.54	857.82
Cottonseed Value ¹	144.11	148.94	159.00	171.15	155.21	152.99	151.45
Expenses							
Seed	123.33	108.98	155.88	134.88	155.88	134.88	127.00
Fertilizers & Nutrients	103.74	103.74	85.86	85.86	85.86	85.86	86.08
Herbicides	41.74	41.74	64.68	64.68	64.68	64.68	82.56
Insecticides	26.14	26.14	37.73	37.73	37.73	37.73	38.60
Other Chemicals	30.70	30.70	34.24	34.24	34.24	34.24	30.00
Custom Applications	25.00	18.00	41.00	34.00	34.00	34.00	35.79
Other Inputs	3.50	3.50	24.53	32.16	29.49	29.12	10.74
Diesel Fuel	10.98	13.43	8.79	10.53	11.89	10.79	12.38
Irrigation Energy Costs	20.01	20.01	7.22	7.22	7.18	7.38	9.05
Input Costs	385.15	366.24	459.93	441.30	460.95	438.69	432.19
Fees	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Repairs & Maintenance ²	28.89	30.68	26.70	27.77	29.69	27.74	28.08
Labor, Field Activities	19.54	21.58	8.72	9.79	13.10	10.52	18.15
Production Expenses	455.58	440.50	517.35	500.87	525.74	498.95	500.42
Interest	10.82	10.46	12.29	11.90	12.49	11.85	11.89
Post-harvest Expenses	144.11	148.94	159.00	171.15	155.21	152.99	151.45
Operating Expenses	466.40	450.96	529.64	512.76	538.23	510.80	512.31
Returns to Operating Expenses	349.82	392.64	370.94	456.64	340.89	355.74	345.51
Capital Recovery & Fixed Costs	154.96	170.29	138.02	149.07	151.66	142.11	150.12
Total Specified Expenses³	621.36	621.25	667.66	661.83	689.89	652.91	662.43
Returns to Specified Expenses	194.86	222.35	232.92	307.56	189.23	213.63	195.39
Operating Expenses/lb.	0.42	0.40	0.44	0.39	0.45	0.44	0.45
Total Expenses/lb.	0.56	0.54	0.55	0.51	0.58	0.56	0.58

¹Price includes cottonseed value equal to post-harvest expenses with a \$0.05/lb. premium added to lint price.

²Includes employee labor allocated to repairs and maintenance.

³Does not include land costs, management, or other expenses and fees not associated with production.