



DIVISION OF AGRICULTURE
RESEARCH & EXTENSION

University of Arkansas System

Cotton Research Verification Program
2018 Annual Report



**Cotton
Incorporated**

Arkansas

ROW CROP VERIFICATION



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Cotton Research Verification Sustainability Program: Economic Report

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Abstract

The University of Arkansas, System Division of Agriculture's Cotton Research Verification Sustainability Program (CRVSP) works with producers to produce cotton more efficiently with the objective of improving profitability. As cost of production continues to increase, the producer is searching for ways in which a modification can be made to their practice in an effort to improve both efficiency and profitability. For cotton to continue being a viable commodity, profitability must be improved.

Introduction

The University of Arkansas, System Division of Agriculture has been conducting the Cotton Research Verification Program (CRVP) since 1980. This is an interdisciplinary effort in which best recommendation 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 307 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 2018 CRVSP was composed of 12 fields, at three locations, with 8 fields being in Desha County, 2 fields in Mississippi County, and 2 fields in St. Francis County. Each field was entered into the Field to Market Fieldprint Calculator. Two fields entered the fourth year of research regarding farmer standard tillage with a stale seedbed compared to that of a modified no-till with cover production system. Increasing both efficiency and profitability will continue being a main part of the program.

The CRVSP has worked along with the University of Arkansas, System Division of Agriculture's Discovery Farms Program in Southeast Arkansas for 6 of the 12 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 fields at Mississippi and St. Francis counties did not have the opportunity to be watered in two sets. In fall, 2017 all no-till cover fields with exception of St. Francis county had either Elbon, or Wrenz albrunzi cereal rye broadcasted, with a target seeding rate of 56 lb/acre. In St. Francis County a mix of 22

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lb/acre of each Elbon cereal rye, and Cosaque black seeded oats was broadcasted. Irrigation methods were composed of either furrow or pivot irrigation at all locations. The diversity of the fields in the program reflect cotton production in Arkansas. Field records were maintained and economic analyses were conducted at seasons end to determine net return/acre for each field in the program.

Results and Discussion

The majority of cotton in Arkansas was planted from late April to late May. Plant bug numbers decreased this year compared to 2017; fields in the CRVSP were treated an average of 3.33 times for plant bugs. Plant bug pressure was similar across all locations as all fields were sprayed 2-4 times during the growing season. Each field had an average of 1.83 burndowns and 4.33 herbicide applications for the 2018 season. Average number of treatments for moths/worms was 1.92. Average costs for herbicides and insecticides were \$78.14 and \$61.72 respectively. Pest control represents a big expense and can impact yields greatly.

Records of field operations on each field provided the basis for estimating expenses. Production data from the 12 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. 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 1. Price received for cotton of \$0.65/lb is the estimated Arkansas annual average for the 2018 production year. Average cotton yield for these verification fields was 1691 lb/acre.

Average operating costs for cotton in Table 1 were \$612.85 per acre. Table 1 indicates that chemicals averaged \$163.25/acre and were 27% of operating expenses. Seed and associated technology fees averaged \$109.59/acre, or 18% of operating expenses and included 6 fields with a cover crop. Fertilizer and nutrient costs averaged 26% of operating expenses and were \$157.22/acre.

With average yield of 1691 lb/acre, average operating costs were \$0.37/lb in Table 1. Operating costs ranged from a low of \$552.37 in the Weaver FS/NC field to a high of \$834.36 in the Manila NT/C field. Returns to operating costs averaged \$486.36 per acre. The range was from a low of \$134.63 in the Wellcot FS/NC field to a high of \$748.34 in the Conder FS/NC field. Average fixed costs were \$154.63 which led to average total costs of \$767.48 per acre. The average returns to total specified costs are \$331.73 per acre. The low was -\$21.60 in the Wellcot FS/NC field and the high was \$592.54 in the Conder FS/NC field. Total specified costs averaged \$0.46/lb.

Practical Applications

This program has become a vital tool in the educational efforts of the University of Arkansas, System Division of Agriculture. 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

The authors would like to acknowledge Cotton Incorporated for their support of this project. The authors would also like to thank producers and County Extension agents for their interest and support of this study.

Table 1. Summary of revenue and expenses per acre for 2018 Cotton Research Verification Sustainability Program fields comparing farmer standard tillage (FS) with or without a cover crop to no-till (NT) with cover crop.

Revenue/Expenses	Field												Average
	Shop NT/C	Shop FS/NC	Weaver NT/C	Weaver FS/NC	Grain Bin NT/C	Grain Bin FS/NC	Home- Place FS/NC	Wellcot FS/NC	Manila NT/C	Manila FS/C	Conder NT/C	Conder FS/NC	
Revenue													
Yield (lb)	1636	1877	1890	1544	1654	1570	1522	1134	2115	1919	1414	2018	1691
Price (\$/lb)	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Total Crop Revenue	1063.40	1220.05	1228.50	1003.60	1075.10	1020.50	989.30	737.10	1374.75	1247.35	919.10	1311.70	1099.20
Cottonseed Value	244.83	280.89	282.84	231.06	247.52	234.95	227.77	169.70	316.51	287.18	211.61	301.99	253.07
Expenses													
Seed	116.11	102.11	116.11	103.40	114.30	100.30	96.35	96.35	116.11	120.53	122.99	110.45	109.59
Fertilizer& Nutrients	129.56	124.63	129.56	124.63	129.56	124.63	151.02	129.56	353.97	160.52	162.72	166.23	157.22
Herbicides	73.22	64.02	57.29	67.71	67.99	73.18	112.39	89.85	96.35	124.06	36.39	75.26	78.14
Insecticides	71.00	73.12	71.02	51.57	71.02	70.51	70.51	70.50	62.33	62.32	33.34	33.34	61.72
Other Chemicals	22.02	23.02	22.79	22.23	22.02	22.02	22.79	23.05	27.96	26.06	22.12	24.57	23.39
Custom Applications	56.00	56.00	49.00	49.00	56.00	56.00	49.00	49.00	0.00	3.92	42.00	14.00	39.99
Other Inputs	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	39.12	35.85	27.44	37.50	14.25
Diesel Fuel	21.68	22.57	21.68	22.89	21.38	23.10	24.15	23.59	19.26	16.76	16.62	16.76	20.87
Irrigation Energy Costs	33.88	32.04	24.37	22.35	17.59	19.12	23.05	30.22	36.38	36.38	20.33	13.38	25.76
Input Costs	527.35	501.39	495.70	467.66	503.73	492.74	553.13	516.00	751.47	586.40	483.94	491.49	530.92
Fees	21.41	21.41	21.41	21.41	21.41	21.41	21.41	21.41	21.41	21.41	21.41	21.41	21.41
Repairs & Maintenance ¹	28.50	31.11	27.62	29.96	26.61	29.40	29.43	30.01	31.88	30.85	29.76	29.46	29.55
Labor, Field Activities	21.20	21.67	21.04	21.72	20.72	21.70	22.72	22.36	12.05	11.65	10.90	9.14	18.07
Production Exp.	598.46	575.57	565.76	540.74	572.47	565.24	626.69	589.79	816.80	650.31	546.01	551.50	599.95
Interest	12.87	12.37	12.16	11.63	12.31	12.15	13.47	12.68	17.56	13.98	11.74	11.86	12.90
Post Harvest Exp.	244.83	280.89	282.84	231.06	247.52	234.95	227.77	169.70	316.51	287.18	211.61	301.99	253.07
Operating Exp.	611.33	587.95	577.93	552.37	584.78	577.39	640.16	602.47	834.36	664.29	557.75	563.36	612.85
Returns to Operating Exp.	452.07	632.10	650.57	451.23	490.32	443.11	349.14	134.63	540.39	583.06	361.35	748.34	486.36
Cap. Recovery and Fixed Costs	145.27	155.71	141.04	153.76	134.23	149.80	151.51	156.23	177.01	171.59	163.64	155.80	154.63
Total Specified Exp.²	756.60	743.65	718.97	706.13	719.02	727.20	791.68	758.70	1011.37	835.89	721.38	719.16	767.48
Returns to Spec. Exp.	306.80	476.40	509.53	297.47	356.08	293.30	197.62	-21.60	363.38	411.46	197.72	592.54	331.73
Operating Exp./lb	.37	0.31	.31	0.36	0.35	.37	.42	0.53	0.39	0.35	0.39	0.28	0.37
Total Expenses/lb	.46	0.40	.38	0.46	0.43	.46	.52	0.67	0.48	0.44	0.51	0.36	0.46

¹Includes employee labor allocated to repairs and maintenance.

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