



**DIVISION OF AGRICULTURE**  
**RESEARCH & EXTENSION**

*University of Arkansas System*

# **Cotton Research Verification Program**

## **2019 Annual Report**



**Cotton**  
**Incorporated**

*Arkansas*

**ROW CROP VERIFICATION**



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## **Cotton Research Verification Sustainability Program: 2019 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 grow cotton more efficiently with the objective of improving profitability. As costs of production continues to increase, producers are searching for ways in which a modification can be made to their practices 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 321 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 mid-south states. In 2014, the CRVP became known as the Cotton Research Verification Sustainability Program (CRVSP). The CRVSP expands beyond that of the traditional verification programs by measuring the producers' environmental footprint for each field and evaluating the connection between profitability and sustainability.

### **Procedures**

The 2019 CRVSP was composed of 14 fields in four counties Desha (8), Clay (2) Mississippi (2), and St. Francis (2). Each field was entered into the Field to Market Fieldprint Calculator. Two fields entered the fifth year comparing farmer standard tillage with a stale seedbed compared to a modified no-till with cover crop production system. Increasing both efficiency and profitability will continue to be 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 14 fields in the program. Discovery Farms' main focus is to monitor edge-of-field water quality. Fields were watered in two sets on Discovery Farm Fields. The split-field arrangement provides the opportunity to compare two production strategies. The farmer standard tillage was compared to a no-till system with cereal rye cover crop. The fields at Clay, Mississippi, and St. Francis Counties could not be irrigated in two sets. In fall of 2018, all no-till cover fields had either Elbon or Wrenz Albrunzi cereal rye broadcasted, with a target seeding rate of 56 pounds per acre. Irrigation methods were composed of either furrow or pivot irrigation at all locations. The diversity of the

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fields in the program reflect cotton production in Arkansas. Field records were maintained and economic analysis were conducted at seasons end to determine net return per acre for each field in the program.

### **Results and Discussion**

The majority of cotton in Arkansas was planted from late April to late May. Tarnished plant bug (TPB) numbers slightly increased this year in the CRVSP fields which were treated an average of 3.57 times compared to 3.33 times in 2018. Tarnished plant bug pressure was similar across all locations as all fields were sprayed 3 to 5 times during the growing season. Each field had an average of 1.86 burndowns and 3 herbicide applications for the 2019 season. The average number of treatments for moth/worms was 1.14. The average costs for herbicides and insecticides were \$75.23 and \$91.82 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 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 cost 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 \$0.70/lb. is the estimated Arkansas annual average for the 2019 production year. Average cotton yield for these verification fields was 1455 lb lint/A, 354 lb lint/A greater than the state average.

The average operating cost for cotton in Table 1 was \$555.40/acre. Table 1 indicates the chemicals averaged \$195.36/acre and were 35% of operating expenses. Seed and associated technology fees averaged \$123.37/acre, or 22% of operating expenses and included 6 fields with a cover crop. Fertilizer and nutrient costs averaged 13% of operating expenses and were \$72.28/acre.

With average yield of 1455lb lint/acre, average operating costs were \$0.39/lb lint (Table 1). Operating costs ranged from a low of \$439.44 in the Mississippi FS/NC field to a high of \$703.19 in the S.W. NT/C field. Returns to operating costs averaged \$463.25/acre. The range was from a low of \$103.95 in the Wellcot FS/NC field to a high of \$669.16 in the Weaver NT/C field. Average fixed costs were \$163.82 which led to average total costs of \$719.22/acre. The average return to total specified costs are \$299.43/acre. The low was -\$58.83 in the Wellcot FS/NC field and the high was \$503.18 in the Weaver NT/C field. Wellcot was the only field in which a negative return was observed. Excluding Wellcot, the Mississippi NT/C generated the least return to specific expenses at \$167.56. The reason for such a low yield in the Wellcot Field is believed to be caused by nematode and soil salinity issues. This field has had lower yields than others in the past but was locked into cotton. This field will be rotated to corn. Total specified costs averaged \$0.50/lb lint. With a land rental agreement of 20% crop share with no cost share would raise the total specified cost to \$0.63/lb lint and does not include return to management and overhead.

### **Practical Applications**

The CRVSP 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 meet its goals and provide timely information to the Arkansas Cotton Community.

### **Acknowledgements**

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**Table 1. Summary of revenue and expenses per acre for 2019 Cotton Research Verification Sustainability Program fields comparing farmer standard tillage (FS) without a cover crop to no-till (NT) with cover crop.**

Revenue/Expenses	Field														Average
	Clay NT/C	Clay FS/NC	Weaver NT/C	Weaver FS/NC	Shop NT/C	Shop FS/NC	S.W. NT/C	S.W. FS/NC	Miss. NT/C	Miss. FS/NC	St. Francis NT/C	St. Francis FS/NC	Homeplace FS/NC	Wellcot FS/NC	
<b>Revenue</b>															
Yield (lb)	1427	1525	1757	1660	1516	1565	1841	1708	1208	1125	1340	1348	1403	950	1455.21
Price (\$/lb)	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
<b>Tot. Crop Rev.</b>	<b>998.90</b>	<b>1067.50</b>	<b>1229.90</b>	<b>1162.00</b>	<b>1061.20</b>	<b>1095.50</b>	<b>1288.70</b>	<b>1195.60</b>	<b>845.60</b>	<b>787.50</b>	<b>938.00</b>	<b>943.60</b>	<b>982.10</b>	<b>665.00</b>	<b>1018.65</b>
<b>Cottonseed Value</b>	<b>213.91</b>	<b>228.60</b>	<b>263.37</b>	<b>248.83</b>	<b>227.25</b>	<b>234.59</b>	<b>275.97</b>	<b>256.03</b>	<b>181.08</b>	<b>168.64</b>	<b>200.87</b>	<b>202.07</b>	<b>210.31</b>	<b>142.41</b>	<b>218.14</b>
<b>Expenses</b>															
Seed	139.48	116.33	117.15	94.00	125.15	121.13	127.70	104.55	184.78	129.30	145.35	134.24	94.00	94.00	123.37
Fert. & Nutrients	55.50	55.50	75.42	75.42	93.63	93.63	85.00	84.99	54.10	54.10	66.89	66.89	75.42	75.42	72.28
Herbicides	64.48	69.43	58.48	60.60	58.48	53.85	137.44	142.01	38.35	38.35	109.53	109.69	58.69	53.85	75.23
Insecticides	61.58	61.58	96.40	89.26	125.26	118.56	132.29	132.29	60.08	60.08	40.25	40.25	144.96	122.66	91.82
Other Chemicals	19.23	25.89	18.44	18.44	21.30	17.16	60.92	60.92	23.86	23.82	34.75	34.75	18.44	18.44	28.31
Custom Applications	0.00	0.00	40.00	32.00	32.00	40.00	8.00	16.00	0.00	0.00	23.00	23.00	40.00	40.00	21.00
Other Inputs	27.65	29.29	3.88	3.88	3.88	3.88	34.55	32.34	3.88	3.88	22.32	22.46	3.88	3.88	14.26
Diesel Fuel	16.67	16.43	27.62	28.48	27.19	26.46	19.89	21.65	30.65	28.62	15.34	15.02	28.15	28.15	23.59
Irr. Energy Costs	13.29	13.29	27.55	37.35	27.43	35.43	14.76	13.29	8.86	8.86	6.73	6.73	21.29	28.52	18.81
<b>Input Costs</b>	<b>397.88</b>	<b>387.74</b>	<b>464.94</b>	<b>439.43</b>	<b>514.32</b>	<b>510.10</b>	<b>620.55</b>	<b>608.04</b>	<b>404.56</b>	<b>347.01</b>	<b>464.16</b>	<b>453.03</b>	<b>484.83</b>	<b>464.92</b>	<b>468.68</b>
Fee's	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	21.41	21.41
Repairs and Maintenance <sup>1</sup>	27.02	26.82	30.32	31.48	30.30	30.06	29.93	30.46	32.21	29.78	26.79	26.41	29.79	30.38	29.41
Labor, Field Act.	9.88	9.51	29.06	29.66	29.06	28.14	12.48	13.19	31.04	29.47	7.33	7.14	29.22	29.33	21.04
<b>Production Exp.</b>	<b>456.19</b>	<b>445.48</b>	<b>545.73</b>	<b>521.98</b>	<b>595.09</b>	<b>589.71</b>	<b>684.37</b>	<b>673.10</b>	<b>489.22</b>	<b>427.67</b>	<b>519.69</b>	<b>507.99</b>	<b>565.25</b>	<b>546.04</b>	<b>540.54</b>
Interest	12.54	12.25	15.01	14.35	16.36	16.22	18.82	18.51	13.45	11.76	14.29	13.97	15.54	15.02	14.86
Post Harvest Exp.	213.91	228.60	263.37	248.83	227.25	234.59	275.97	256.03	181.08	168.64	200.87	202.07	210.31	142.41	218.14
<b>Operating Exp.</b>	<b>468.72</b>	<b>457.72</b>	<b>560.74</b>	<b>536.33</b>	<b>611.45</b>	<b>605.93</b>	<b>703.19</b>	<b>691.61</b>	<b>502.68</b>	<b>439.44</b>	<b>534.00</b>	<b>521.95</b>	<b>580.79</b>	<b>561.05</b>	<b>555.40</b>
<b>Returns to Op. Exp.</b>	<b>530.18</b>	<b>609.78</b>	<b>669.16</b>	<b>625.67</b>	<b>449.75</b>	<b>489.57</b>	<b>585.51</b>	<b>503.99</b>	<b>342.92</b>	<b>348.06</b>	<b>404.00</b>	<b>421.65</b>	<b>401.31</b>	<b>103.95</b>	<b>463.25</b>
Cap. Recovery and Fixed Costs	150.88	150.75	165.98	170.49	164.89	160.88	175.65	181.06	175.36	167.06	156.00	151.99	159.75	162.78	163.82
<b>Tot. Specified exp.<sup>2</sup></b>	<b>619.60</b>	<b>608.47</b>	<b>726.72</b>	<b>706.82</b>	<b>776.35</b>	<b>766.81</b>	<b>878.85</b>	<b>872.67</b>	<b>678.04</b>	<b>606.50</b>	<b>690.00</b>	<b>673.94</b>	<b>740.54</b>	<b>723.83</b>	<b>719.22</b>
<b>Returns to Spec. Exp.</b>	<b>379.30</b>	<b>459.03</b>	<b>503.18</b>	<b>455.18</b>	<b>284.85</b>	<b>328.69</b>	<b>409.85</b>	<b>322.93</b>	<b>167.56</b>	<b>181.00</b>	<b>248.00</b>	<b>269.66</b>	<b>241.56</b>	<b>-58.83</b>	<b>299.43</b>
Operating Exp./lb	0.33	0.30	0.32	0.32	0.40	0.39	.38	.40	0.42	0.39	0.40	0.39	0.41	0.59	0.39
Total Expenses/lb	0.43	0.40	0.41	0.43	0.51	0.49	.48	.51	0.56	0.54	0.51	0.50	0.53	0.76	0.50

<sup>1</sup> Includes employee labor allocated to repairs and maintenance.

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

<sup>3</sup> Abbreviations: C=Cover, NC= No Cover.