



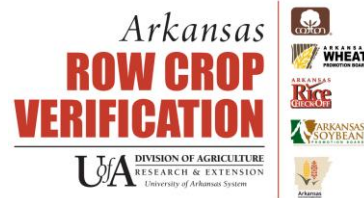
**DIVISION OF AGRICULTURE
RESEARCH & EXTENSION**

University of Arkansas System

**2018
University of Arkansas
Corn and Grain Sorghum Research
Verification Program**

The Corn and Grain Sorghum Research Verification Program is funded by Arkansas corn and grain sorghum producers through checkoff monies administered by the Arkansas Corn and Grain Sorghum Promotion Board.

University of Arkansas
Cooperative Extension Service
Agriculture Experiment Station
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CORN & GRAIN SORGHUM RESEARCH VERIFICATION PROGRAM, 2018

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INTRODUCTION

The 2018 growing season was the nineteenth year for the Corn and Grain Sorghum Research Verification Program (CGSRVP). The CGSRVP is an interdisciplinary effort between growers, county Extension agents, Extension specialists, and researchers. The CGSRVP is an on-farm demonstration of all the research-based recommendations required to grow corn and grain sorghum profitably in Arkansas. The specific objectives of the program are:

1. To verify research-based recommendations for profitable corn and grain sorghum production in all corn and grain sorghum producing areas of Arkansas.
2. To develop a database for economic analysis of all aspects of corn and grain sorghum production.
3. To demonstrate that consistently high yields of corn and grain sorghum can be produced economically with the use of available technology and inputs.
4. To identify specific problems and opportunities in Arkansas corn and grain sorghum production for further investigation.
5. To promote timely implementation of cultural and management practices among corn and grain sorghum growers.
6. To provide training and assistance to county agents with limited expertise in corn and grain sorghum production.

Each CGSRVP field and cooperator was selected prior to planting. Cooperators agreed to pay production expenses, provide crop expense data for economic analysis and implement the recommended production practices in a timely manner from seedbed preparation to harvest. Nine growers enrolled in the CGSRVP in the spring of 2018, seven corn and two grain sorghum fields. The fields were located on commercial farms and ranged in size from 35 to 80 acres for the corn fields with an average field size of 48.2 acres. The grain sorghum fields were 83 and 24 acres.

The 2018 CGSRVP corn fields were in Arkansas, Clay, Chicot, Desha, Jackson, Jefferson and Prairie Counties; and the grain sorghum fields were in Arkansas and Cross Counties. Management decisions were based on field history, soil test results, hybrids, and data collected from each individual field during the growing season.

An electronic copy of this publication can be found at the following web addresses:

www.uaex.edu/verification

www.uaex.edu/corn

www.uaex.edu/cgsrvp

www.uaex.edu/grain-sorghum

Figure 1. Location of 2018 Corn and Grain Sorghum Research Verification Fields



Figure 1

Corn Field

Grain Sorghum Field

CORN FIELD REVIEWS

Arkansas County

The Arkansas County corn research verification field was located near Casscoe on a Calloway Silt Loam. The field was 35 acres and the previous crop was corn. The field was hipped and rolled in the fall. A fertilizer blend of 50-60-90-10-10 was applied on April 20. The field was planted on April 20 with AgriGold A6499 VT2RIB at 35,000 seeds per acre on 30 inch row spacing. The field emerged on May 1 and the final plant population was 31,400 plants per acre. On May 19, 3.6 pints of Halex GT, 2 quarts of atrazine, and 1 oz per acre of Permit was applied by the producer for weed control. On May 22, 300 pounds of Urea (138 units N) was custom applied. A pre-tassel application of 100 pounds of Urea (46 units) was applied on June 13. Total fertilizer for this field was 234-60-90-10-10. The field was irrigated four times. The field was harvested on October 30 at 15% moisture and yielded 178.1 bushels per acre adjusted to 15.5% moisture.

Chicot County

The Chicot County corn research verification field was located near Lake Village on a Rilla Silt Loam. The field was 48 acres and the previous crop was soybeans. A burdown application of glyphosate and Verdict was applied on April 18. The field was planted on April 21 with Ag-Venture AV8614 at 34,000 seeds per acre on 38 inch row spacing followed by a fertilizer blend of 60-60-60-0-5. The field emerged on April 30 and the final plant population was 28,400 plants per acre. On May 22, 113 units N plus 24 units of sulfur was applied. On May 23, 3.6 pints of Halex GT plus 2 quarts of atrazine was applied by the producer for weed control. A pre-tassel application of 100 pounds of Urea (46 units) was applied on June 9. Total fertilizer for this field was 219-60-60-24-5. The field was not irrigated due issues with irrigation well. This area did receive some rainfall that surrounding areas did not. The field was harvested on September 14 at 16% moisture and yielded 208 bushels per acre adjusted to 15.5% moisture.

Clay County

The Clay County corn research verification field was located near Knob on a Falaya Silt Loam soil. The field was 50 acres and the previous crop was soybeans. The field was disked and land planed on March 15. 40-0-80-24 was applied on April 11 followed by bedding. The field was planted on April 12 with Pioneer 1870YHR at 34,000 seeds per acre on 30 inch row spacing followed the next day by a pre-emerge application of Dual II Magnum at 1 pint per acre and 1 quart per acre of glyphosate. The field emerged on May 1 and the final plant population was 31,400 plants per acre. Two hail storms over the first month reduced the stand to 29,000 plants per acre. On May 14, 290 pounds of Urea (134 units N) was custom applied and 3.6 pints of Halex GT plus 2 quarts of atrazine was applied by the producer for weed control. A pre-tassel application of 100 pounds of Urea (46 units) was applied on June 11. Total fertilizer for this field was 220-0-50-24-0. The field was irrigated six times. The field was harvested on September 14 at 16% moisture and yielded 217.5 bushels per acre adjusted to 15.5% moisture.

Desha County

The Desha County corn research verification field was located just south of Dumas. The field was 45 acres and the previous crop was soybeans. A bedder/roller was ran in the fall and a burndown application was made on February 26. The field was planted on March 21 with Pioneer 1870YHR at 34,000 seeds per acre on 38 inch row spacing followed the next day by a pre-emerge application of Dual II Magnum at 1 pint per acre. The field emerged on April 3 and the final plant population was 30,000 plants per acre. On April 19, 92-25-0-12-10 blend of fertilizer was applied. 200 pounds of Urea (92 units N) was custom applied on May 10. On May 11, 3.6 pints of Halex GT plus 1.5 quarts of atrazine was applied by the producer for weed control. A pre-tassel application of 100 pounds of Urea (46 units) was applied on May 31. Total fertilizer for this field was 230-25-0-12-10. The field was irrigated six times. The field was harvested on Septmeber 15 at 15.5% moisture and yielded 198 bushels per acre adjusted to 15.5% moisture.

Jackson County

The Jackson/Poinsett County corn research verification field was located in the eastern part of Jackson County East of Amagon and was a collaborative effort between the Jackson and Poinsett County extension agents. The field was just over 40 acres and the previous crop was corn. The soil type was Calhoun Silt Loam. A mixed preplant fertilizer of 60-90-90-0-10 was custom applied on April 10, followed by hipper roller on 30 inch beds. The field was planted the same day with Pioneer 1870YHR at 34,000 seeds per acre on 30 inch row spacing. The field emerged on April 24 and the final plant stand was 32,100 plants per acre. The producer applied 1 pint of Dual II Magnum, 1 quart of atrazine, and 1 quart of glyphosate per acre on April 11. 250 pounds per acre of Urea plus 12 pounds of sulfur was applied on May 17. A pre-tassel application of 100 pounds of Urea (46 units N) was aerially applied on June 4. Total fertilizer for the field was 221-90-90-12-10. The field was furrow irrigated 7 times. The field was harvested on September 19 at 13.4% moisture and yielded 240.1 bushels per acre adjusted to 15.5% moisture.

Jefferson County

The Jefferson County corn research verification field was located near Grider Field Airport just south of Pine Bluff. The field was 80 acres and the previous crop was soybean. The field was disked, field cultivated, limed, and had poultry litter applied at two tons/acre in the fall. On March 20, a burndown application of glyphosate and FirstShot was made. The field was planted on April 19 with DeKalb 67-72 at 34,000 seeds per acre on 30 inch row spacing. The field emerged on April 30 and the final plant population was 32,000 plants per acre. The producer applied 250 pounds of Urea (115 units N) on May 15 followed by 3.6 pints per acre of Halex GT and 1.5 quarts of atrazine for weed control. A pre-tassel application of 100 pounds of Urea (46 units N) was aerially applied on June 12. The field was pivot irrigated 6 times. The field was harvested on October 4 at 15% moisture and yielded 198.4 bushels per acre adjusted to 15.5% moisture which included a 14% yield adjustment from crop insurance due to wind damage on June 13.

Prairie County

The Prairie County corn research verification field was located in the northern part of the county near Des Arc. The field was 40 acres and the previous crop was soybeans. The soil type was an Immanuel Silt Loam. The field was turbo tilled and floated on March 20. A mixed preplant fertilizer of 56-104-76-0-0 was applied on March 20 then bedded and rolled into a 60 inch bed the following day. The field was planted on March 21 with Dyna-Gro D57VC51 at 34,000 seeds per acre on 30 inch row spacing. The field emerged on April 11 and the final plant population was 30,500 plants per acre. The producer applied 3.6 pints per acre of Halex GT and 2 quarts per acre of atrazine on May 12 followed by 250 pounds of Urea. A pre-tassel application of 100 pounds of Urea (46 units N) was aerially applied on June 5. Total fertilizer for the field was 219-104-76-0-0. The field was furrow irrigated 6 times. The field was harvested on September 19 at 14% moisture and yielded 188 bushels per acre adjusted to 15.5% moisture.

GRAIN SORGHUM FIELD REVIEW

Arkansas County

The Arkansas County grain sorghum research verification field was located in the northern part of the county near Casscoe. The field was 24 acres and previous crop was soybeans. The soil type was a Calloway Silt Loam. A mixed pre-plant fertilizer of 50-60-60-24-5 was applied on May 1 followed by field cultivator. The field was planted on May 1 to DeKalb 53-53 at 70,000 seeds/acre on 30 inch row spacing with no beds. 1 pint per acre of Dual II Magnum and 1 quart per acre of atrazine was applied by the producer on May 22. The field emerged on May 8 to a final plant population of 64,875 plants per acre. On May 22, 150 pounds of Urea (69 units N) was custom applied. Total fertilizer for the field was 119-60-60-24-5. The field was sprayed with 16 ounces of Prevathon on July 17 for headworm control. The field was harvested on September 24 at 13.7% moisture and yielded 58 bushels per acre adjusted to 14% moisture. The field was not irrigated, and dry weather during heading reduced yield potential. We had some wind damage in early June that caused lodging in some areas that reduced yields as well.

Cross County

The Cross County grain sorghum research verification field was located near Cherry Valley. The field was 83 acres and previous crop was soybeans. The field was leveled just prior to planting with some deep cuts in places. Two tons of chicken litter was applied followed by a 46-60-60-12-10. The field was planted on May 3 to DeKalb 53-53 at 94,700 seeds/acre on 30 inch row spacing. The field emerged on May 9 to a final plant population of 94,000 plants per acre. On May 22, 250 pounds of Urea (115 units N) was custom applied. Total fertilizer for the field was 161-60-60-12-10. 30 ounces per acre of Facet L and 1 quart per acre of atrazine was applied on May 28. The field was sprayed with 16 ounces of Prevathon on July 16 for headworm control. The field was harvested on September 21 at 14% moisture and yielded 130.3 bushels per acre adjusted to 14% moisture.

Table 1. Agronomic information for the 2018 Corn Research Verification Fields.

County	Hybrid	Field Size (ac)	Row Spacing (in)	Previous Crop	Planting Population (seeds/ac)	Plant Stand (plants/ac)	Planting Date	Emergence Date	Harvest Date	Yield (bu/ac)
Arkansas	AgriGold A6499 VT2RIB	35.0	30"	Corn	35,000	31,400	4/20/18	5/1/18	10/30/18	178.1
Chicot	Ag Venture AV8614	48.0	38"	Soybean	34,000	28,400	4/21/18	4/30/18	9/14/18	208.0
Clay	Pioneer 1870YHR	50.0	30"	Soybean	34,000	29,000	4/11/18	5/1/18	9/14/18	217.5
Desha	Pioneer 1870YHR	45.0	38"	Soybean	34,000	30,000	3/21/18	4/3/18	9/15/18	198
Jackson	Pioneer 1870YHR	40.0	30"	Corn	34,000	32,100	4/10/18	4/24/18	9/19/18	240.1
Jefferson	DeKalb 67-72	80	38"	Soybean	34,000	32,000	4/19/18	4/30/18	10/4/18	198.4
Prairie	Dyna-Gro D57VC51	40	30"	Soybean	34,000	30,500	3/21/18	4/11/18	9/19/18	188.0
Average		48.2			34,143	30,486	4/9/18	4/23/18	10/1/18	204.0

Traits – ¹ YieldGard, Herculex I, Roundup Ready Corn 2, Liberty Link

² Genuity VT Double Pro

³ Herculex I, Roundup Ready Corn 2, Liberty Link

Table 2. Agronomic information for the 2018 Grain Sorghum Research Verification Fields.

County	Hybrid	Field Size (ac)	Row Spacing (in)	Previous Crop	Planting Population (lbs/ac)	Plant Stand (plants/ac)	Planting Date	Emergence Date	Harvest Date	Yield (bu/ac)
Arkansas	DeKalb 53-53	24	30"	Soybeans	70,000	64,875	5/1/18	5/8/18	9/24/18	58.0
Cross	DeKalb 53-53	83	30"	Soybeans	94,700	94,000	5/3/18	5/9/18	9/21/18	130.3
Average		53.5			82,350	79,438	5/2/18	5/9/18	9/23/18	94.2

Table 3. Fertility Program for 2018 Corn RVP Fields.

County	Applied Fertilizer N-P-K-S-Zn ¹ (lb/ac)			Total Applied Fertilizer N-P-K-S-Zn	Soil Classification
	Preplant	Sidedress	Pre Tassel		
Arkansas	50-60-90-10-10	138-0-0-0-0	46-0-0-0-0	234-60-90-10-10	Calloway Silt loam
Chicot	60-60-60-0-5	113-0-0-24-0	46-0-0-0-0	219-60-60-24-5	Rilla Silt Loam
Clay	40-0-80-24-0	134-0-0-0-0	46-0-0-0-0	220-0-50-24-0	Falaya Silt Loam
Desha	92-25-0-12-10	92-0-0-0-0	46-0-0-0-0	230-25-0-12-10	Tutwiler Silt Loam
Jackson	60-90-90-0-10	115-0-0-12-0	46-0-0-0-0	221-90-90-12-10	Calhoun Silt Loam
Jefferson	60-60-60-0-10	115-0-0-0-0	46-0-0-0-0	221-60-60-0-10	Rilla Silt Loam
Prairie	56-104-76-0-0	115-0-0-0-0	46-0-0-0-0	217-104-76-0-0	Immanuel Silt Loam

Table 4. Fertility Program for 2018 Grain Sorghum RVP Fields.

County	Applied Fertilizer N-P-K-S-Zn ¹ (lb/ac)		Total Applied Fertilizer N-P-K-S-Zn	Soil Classification
	Preplant	Sidedress		
Arkansas	50-60-60-24-5	69-0-0-0-0	119-60-60-24-5	Calloway Silt Loam
Cross	46-60-60-12-10	115-0-0-0-0	161-60-60-12-10	Collins Silt Loam

¹ N=nitrogen, P= phosphorus, K=potassium, S=sulfur and Zn=zinc.

Table 5. Pesticide information for the 2018 Corn Research Verification fields.

County	Herbicide	Insecticide	Fungicide
Arkansas	3.6 pt/acre Halex GT + 2 qt/acre atrazine + 1 oz/acre Permit + 0.25% AMS	None	None
Chicot	1 qt/acre glyphosate + 10 oz/acre Verdict, 3.6 pt/acre Halex GT + 2 qt/acre atrazine	None	None
Clay	1 pt/acre Dual II Magnum + 1 qt/acre glyphosate, 3.6 pt/acre Halex GT + 2 qt/acre atrazine	None	None
Desha	1.5 oz/acre Leadoff + 1 pt/acre 2,4-D, 1 qt/acre Power Max, 1 pt/acre Dual II Magnum, 3.6 pt/acre Halex GT + 1.5 qt/acre atrazine	None	None
Jackson	1 pt/acre Dual II Magnum + 1 qt/acre glyphosate + 1 qt/acre atrazine, 3.6 pt/acre Halex GT + 1 qt/acre atrazine	None	None
Jefferson	1 qt/acre glyphosate + 0.5 oz/acre FirstShot, 3.6 pt/acre Halex GT + 1.5 qt/acre atrazine	None	None
Prairie	3.6 pt/acre Halex GT + 2 qt/acre atrazine	None	None

Table 6. Pesticide information for the 2018 Grain Sorghum Research Verification field.

County	Herbicide	Insecticide	Fungicide
Arkansas	1 pt/acre Dual II Magnum + 1 qt/acre atrazine	16 oz Prevathon – July 17	None
Cross	30 oz/acre Facet L + 1 qt/acre atrazine	16 oz Prevathon – July 16	None

Table 7. Irrigation type, frequency, and rainfall totals for growing season.

County	Irrigation Type	*Number of Irrigations	**Rainfall (in) Planting to Black Layer (R6)
Arkansas	Furrow	4	8.85
Chicot	Non Irrigated	---	10.72
Clay	Furrow	6	12.84
Desha	Furrow	6	16.96
Jackson	Furrow	7	13.09
Jefferson	Furrow	6	11.33
Prairie	Furrow	6	17.33

Table 8. Irrigation type, frequency, and rainfall totals for growing season.

County	Irrigation Type	*Number of Irrigations	**Rainfall (in) Planting to Maturity
Arkansas	Non Irrigated	---	8.03
Cross	Furrow	4	8.23

*Each furrow irrigation provided approximately 2 acre/inches of water.

**Rainfall amount measured in verification field by weather stations.

Table 9. Corn growth stages and corresponding Growing Degree Days for the 2018 Corn Research Verification Fields. *

Growth Stage	Accumulated Growing Degree Days (GDD50)							Average
	Arkansas	Chicot	Clay	Desha	Jackson	Jefferson	Prairie	
VE	161	148	219	204	161	143	173	173
V2	294	290	345	291	273	281	287	294
V4	420	441	501	489	436	430	503	460
V6	604	607	678	647	623	632	620	630
V8	794	777	836	798	767	798	774	792
V10	996	945	998	933	928	978	934	959
V12	1093	1062	1097	1039	1016	1081	1065	1065
V14	1225	1195	1222	1178	1164	1184	1207	1196
V16	1341	1310	1336	1289	1279	1323	1334	1316
R1	1538	1485	1568	1536	1542	1556	1523	1535
R2	1653	1686	1758	1707	1742	1732	1697	1711
R3	1835	1808	1967	1884	1886	1912	1864	1879
R4	2014	1961	2136	2029	2038	2088	2014	2040
R5	2191	2139	2255	2181	2213	2237	2196	2202
R6	2828	2758	2877	2846	2833	2767	2825	2819

*Based on weekly field visits

Economic Analysis – Breana Watkins

This section provides information on production costs for the 2018 CGSRVP. Records of field operations on each field provide the basis for estimating these costs. The field records were compiled by the CGSRVP coordinator, county Extension agents, and cooperators. Production data from the 9 fields (7 corn and 2 grain sorghum) were applied to determine costs and returns above operating costs, as well as total specified costs. Operating costs and total costs per bushel indicate the commodity price needed to meet each costs type.

Production expenses are expenditures that would generally require annual cash outlays and would be included on an annual operating loan application. Actual quantities of all production inputs as reported by the cooperators are used in this analysis. Input prices are determined by data from the 2018 Crop Enterprise Budgets published by the Cooperative Extension Service and information provided by the producer cooperators. Fuel and repair costs for machinery are calculated using a budget calculator based on parameters and standards established by the American Society of Agricultural and Biological Engineers. Machinery repair costs should be regarded as estimated values for full service repairs, and actual cash outlays could differ as producers utilize employee labor or provide unpaid labor for equipment maintenance.

Operating expenses include production expenses, as well as interest paid on operating capital and all post-harvest expenses. Post-harvest expenses include, as applicable for each crop, hauling, drying, check-off fees, and other expenses typically incurred after harvest. Post-harvest expenses increase or decrease with yield.

Ownership costs of machinery are determined by a capital recovery method which determines the amount of money that should be set aside each year to replace the value of equipment used in production. Machinery costs are estimated by applying engineering formulas to represent prices of new equipment. This measure differs from typical depreciation methods, as well as actual annual cash expenses for machinery, but establishes a benchmark that estimates farm profitability.

Operating costs, total costs, costs per bushel, and returns are presented in Table 10 for corn and grain sorghum. Costs in this report do not include land costs, management or other expenses and fees not associated with production. Budget summaries for corn are presented in Table 11. A summary for grain sorghum is shown in Table 12. Price received for corn of \$3.35/bu is the 2018 average for the most active weeks of the harvest period. The corresponding average prices for grain sorghum is \$3.00/bu as determined by the most active weeks of the grain sorghum harvest period. Average corn yield from the verification fields harvested for grain is 194.87 bu/acre and the grain sorghum yield is 94.15 bu/acre.

Average production expenses for the corn fields harvested for grain in Table 11 are \$518.73 per acre. Table 11 indicates that seed costs are the largest expense category at \$138.71 per acre, or 27.4% of production expenses.

With average corn yield of 204.0 bu/acre, average operating costs are \$2.58/bu in Table 10. Operating costs range from a low of \$450.76 in the Chicot County field to a high of \$537.32 in Jefferson County. Returns to operating costs average \$160.60 per acre. Returns to operating costs have a low of \$67.09 in Arkansas County and a high of \$278.61 in the Jackson County field.

Average fixed costs are \$81.36 which leads to an average total costs of \$600.14 per acre. Returns to total costs average \$79.24 per acre with a low of -\$3.61 in Arkansas County and a high of \$199.95 in the Jackson County field. Total specified costs average \$2.98/bu.

The grain sorghum field has an average production expense of \$285.30 per acre in Table 12. Fertilizers and nutrients are 38% of production expenses with an average expense of \$107.13 per acre in Table 12. Operating expenses average \$285.30 which is \$3.35/bu as determined by the average yield of 94.15. Returns to operating costs average -\$2.85 per acre. Fixed costs average \$77.80 per acre. This leads to average total costs of \$363.11 per acre, or \$4.30/bu. Returns to total specified costs average -\$80.66 per acre.

Table 10. Operating Costs, Total Costs, and Returns, 2018 Corn & Grain Sorghum RVP in dollars.

Corn							
Field	Operating Costs	Operating Costs/Bu	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs/Bu
Arkansas	529.54	2.97	67.09	70.70	600.25	-3.61	3.37
Chicot	450.76	2.31	217.24	58.08	508.83	159.17	2.58
Clay	537.20	2.47	191.42	84.48	621.69	106.94	2.86
Desha	529.28	2.67	134.02	93.93	623.21	40.09	3.15
Jackson	525.72	2.19	278.61	78.66	604.69	199.95	2.52
Jefferson	537.32	2.71	127.32	90.48	627.81	36.83	3.16
Prairie	521.30	2.77	108.50	93.16	614.46	15.34	3.27
Average	518.73	2.58	160.60	81.36	600.14	79.24	2.98
Grain Sorghum							
Arkansas	244.26	4.21	-70.26	72.53	316.80	-142.80	5.46
Cross	326.34	2.50	64.56	83.07	409.41	-18.51	3.14
Average	285.30	3.35	-2.85	77.80	363.11	-80.66	4.30

Table 11. 2018 Corn RVP, Summary of Revenue and Expenses per Acre.

Revenue	Arkansas	Chicot	Clay	Desha	Jackson	Jefferson	Prairie	AVG
Yield: Grain (bu.)	198.4	208.0	217.5	198.0	240.1	198.4	188.0	204.0
Price: Grain (\$/bu.)	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35
Total Crop Revenue	596.64	696.80	728.63	663.30	804.34	664.51	629.80	683.43
Expenses								
Seed	142.19	138.13	138.13	138.13	138.13	138.13	138.13	138.71
Fertilizers & Nutrients	153.13	131.72	120.45	114.28	141.10	151.25	144.72	136.66
Herbicides	52.47	44.12	46.03	62.51	24.01	37.49	34.67	43.04
Insecticides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom Applications	21.00	14.00	28.00	21.00	21.00	21.00	21.00	21.00
Other Inputs	3.88	0.00	3.88	3.88	3.88	3.88	3.88	3.33
Diesel Fuel	12.33	10.21	14.32	10.64	11.11	13.48	17.64	12.82
Irrigation Energy Costs	12.22	0.00	31.18	31.18	21.39	18.34	18.34	18.10
Input Costs	397.22	338.18	381.99	381.62	360.62	389.93	378.36	374.54
Fees	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Repairs & Maintenance ¹	28.71	27.06	31.31	35.15	33.75	32.79	32.47	32.18
Labor, Field Activities	8.00	6.60	10.78	8.16	8.52	9.89	10.68	9.22
Production Expenses	439.94	377.84	430.08	430.92	408.08	438.61	427.51	421.66
Interest	9.46	8.12	9.25	9.26	8.79	9.43	9.19	9.07
Post-harvest Expenses	80.15	64.80	97.88	89.10	108.05	89.28	84.60	87.69
Total Operating Expenses	529.54	450.76	537.20	529.28	525.72	537.32	521.30	518.73
Returns to Operating Expenses	67.09	217.24	191.42	134.02	278.61	127.32	108.50	145.74
Capital Recovery & Fixed Costs	70.70	58.08	84.48	93.93	78.66	90.48	93.16	77.40
Total Specified Expenses²	600.25	508.83	621.69	623.21	604.39	627.81	614.46	584.45
Returns to Specified Expenses	-3.61	159.17	106.94	40.09	199.95	36.83	15.34	68.35
Operating Expenses/bu.	2.97	2.31	2.47	2.67	2.19	2.71	2.77	2.64
Total Specified Expenses/bu.	3.37	2.58	2.86	3.02	2.52	3.16	3.27	3.05

¹Includes employee labor allocated to repairs and maintenance and crop insurance.

Table 12. Summary of Revenue and Expenses per Acre, 2018 Grain Sorghum RVP

Revenue	Arkansas	Cross	Average
Yield (bu.)	58.0	130.3	94.15
Price (\$/bu.)	3.00	3.00	3.00
Total Crop Revenue	174.00	390.90	282.45
Expenses			
Seed	13.80	18.53	16.17
Fertilizers & Nutrients	105.28	108.97	107.13
Herbicides	17.25	33.06	25.16
Insecticides	18.50	18.50	18.50
Other Chemicals	0.00	0.00	0.00
Custom Applications	14.00	28.00	21.00
Other Inputs	0.00	0.00	0.00
Diesel Fuel	13.10	16.16	14.63
Irrigation Energy Costs	0.00	12.22	6.11
Input Costs	181.93	239.33	210.63
Fees	6.00	6.00	6.00
Repairs & Maintenance ¹	27.62	30.10	28.86
Labor, Field Activities	8.81	10.88	9.85
Production Expenses	224.36	286.31	255.34
Interest	4.82	6.16	5.49
Post-harvest Expenses	15.08	33.88	24.48
Total Operating Expenses	244.26	326.34	285.30
Returns to Operating Expenses	-70.26	64.56	-2.85
Capital Recovery & Fixed Costs	72.53	83.07	77.80
Total Specified Expenses²	316.80	409.71	363.11
Returns to Specified Expenses	-142.80	-18.51	-80.66
Operating Expenses/bu.	4.21	2.50	3.35
Total Specified Expenses/bu.	5.46	3.14	4.30