



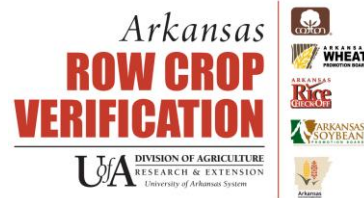
**DIVISION OF AGRICULTURE  
RESEARCH & EXTENSION**

*University of Arkansas System*

**2016  
University of Arkansas  
Corn and Grain Sorghum Research  
Verification Program**

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University of Arkansas  
Cooperative Extension Service  
Agriculture Experiment Station  
U.S. Department of Agriculture  
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## Table of Contents

	<b>Page</b>
Authors and Acknowledgments.....	2
Introduction.....	3
Figure 1. Location of the 2016 Corn and Grain Sorghum Research Verification Fields.....	4
Corn Field Reviews, Clay and Lincoln Counties.....	5
Corn Field Reviews, Pope, Prairie Counties and River Valley.....	6
Corn Field Reviews, St Francis County.....	7
Grain Sorghum Field Reviews, Jefferson and White Counties.....	8
Tables 1 & 2. Agronomic information for the 2016 Research Verification Fields.....	9
Tables 3 & 4. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2016 Research Verification Fields .....	10
Tables 5 & 6. Pesticide information for the 2016 Research Verification Fields.....	11
Tables 7 & 8. Irrigation information and rainfall for the 2016 Research Verification Fields.....	11
Table 9. Corn growth stages and corresponding Growing Degree Days for the 2016 Corn Research Verification Fields.....	12
Economic Analysis.....	13
Table 10. Operating Costs, Total Costs, Costs per Bushel, and Returns for the 2016 Research Verification Fields.....	15
Table 11. Summary of Revenue and Expenses per Acre for the 2016 Corn Research Verification Fields.....	16
Table 12. Summary of Revenue and Expenses per Acre for the 2016 Grain Sorghum Research Verification Field.....	17

## 2016 CORN & GRAIN SORGHUM RESEARCH VERIFICATION PROGRAM

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## INTRODUCTION

The 2016 growing season was the seventeenth 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. Eight growers enrolled in the CGSRVP in the spring of 2016, six corn and two grain sorghum fields. The fields were located on commercial farms and ranged in size from 35.2 to 71.1 acres for the corn fields with an average field size of 52.5 acres. The grain sorghum fields were 33.9 and 51.9 acres and averaged 42.9 acres.

The 2016 CGSRVP corn fields were in Clay, Lincoln, Pope, Prairie, and St Francis Counties; and the grain sorghum fields were in Jefferson and White Counties. There was another corn field in the River Valley that was a collaboration between six County Agents. Six corn hybrids (Armor 1555PRO2, DeKalb DKC 66-87VT2P, Pioneer 1319HR, Pioneer 1637YHR, Pioneer P2089YHR and Terral REV 23BHR55) and two grain sorghum hybrids (Armor Maverick and Pioneer 83P99) were planted. Management decisions were based on field history, soil test results, hybrids, and data collected from each individual field during the growing season.

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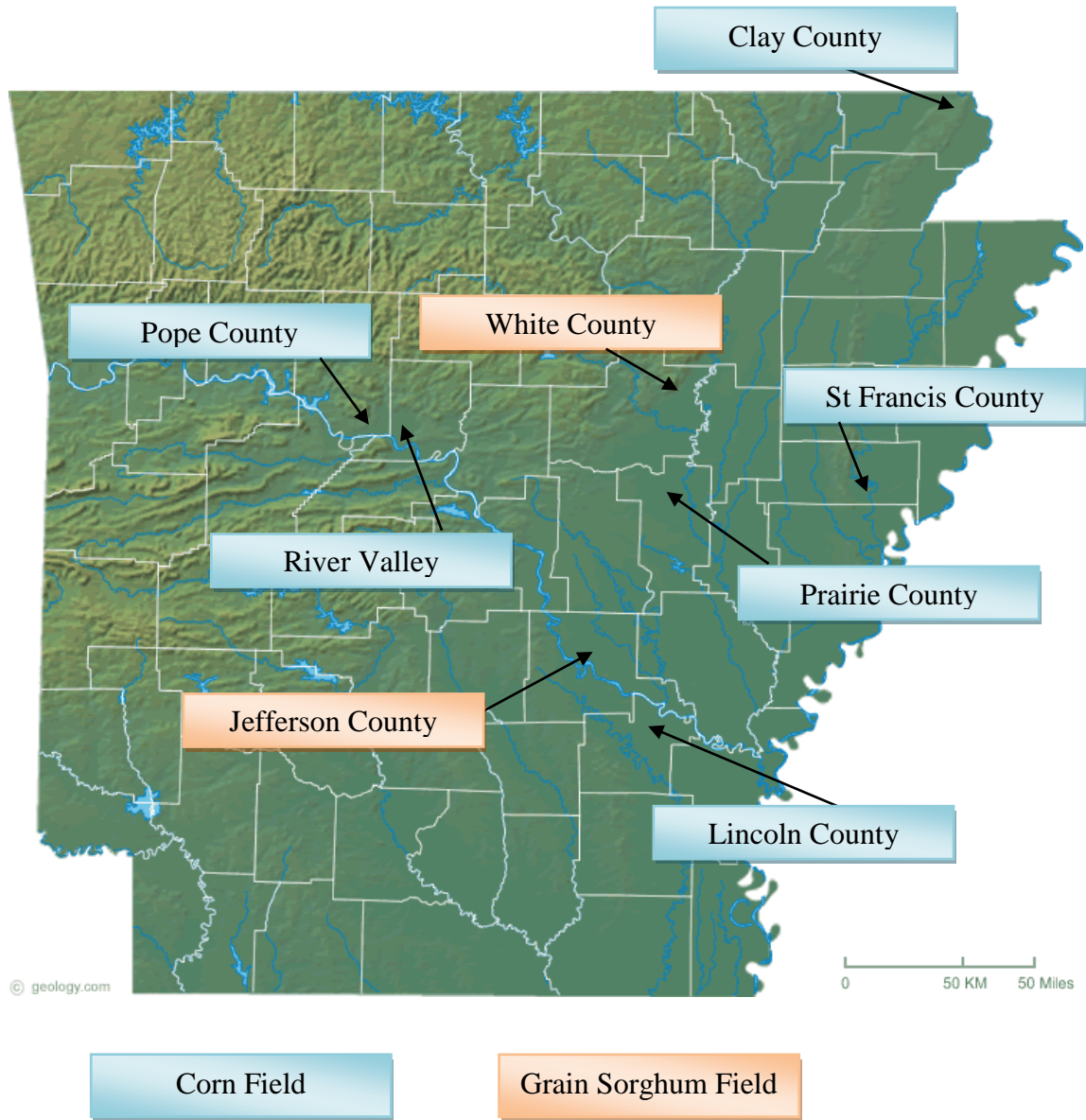
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[www.uaex.edu/grain-sorghum](http://www.uaex.edu/grain-sorghum)

**Figure 1. Location of 2016 Corn and Grain Sorghum Research Verification Fields**



## CORN FIELD REVIEWS

### Clay County

The Clay County corn research verification field was located in the northeastern part of the county near Pollard. The field was 35.2 acres and the previous crop was soybeans. The soil type was Faylata Silt Loam. The field was turbo tilled on March 15 and a mixed preplant fertilizer of 102-45-114-12-10 was custom applied on March 28 followed by bedding. The field was planted on March 28 with Pioneer 1637YHR at 34,500 seeds per acre on 30 inch row spacing. A herbicide application of 1 quart of glyphosate plus 1.3 pints of metolachlor was applied by the producer on March 30. Heavy rains packed the soil and the plants had trouble emerging so in late April a decision was made to replant the field. The field was turbo tilled again and replanted on April 25 with the same hybrid at the same seeding rate. The field emerged on May 7 and the final plant population was 33,000 plants per acre. A sidedress application of fertilizer containing 240 pounds of Urea (110 units N) and 50 pounds of Ammonium Sulfate (11 units N, 12 units S) was applied on May 23. Since there were several inches of rain after planting, it was feared that some of the early nitrogen may have been lost, so an extra 50 units was applied. 3.6 pints of Halex GT plus 1.5 quarts of atrazine was applied by the producer on June 2 for weed control. A pretassel application of 100 pounds of Urea (46 units N) was applied on June 20. Total fertilizer for this field was 269-45-114-24-10. The field received 21.7 inches of rain from planting to R6 (black layer) and 22.9 inches from planting until harvest. The field was furrow irrigated 5 times. The field was harvested on September 13 at 14.5% moisture and yielded 175.3 bushels per acre adjusted to 15.5% moisture.

### Lincoln County

The Lincoln County corn research verification field was located in the northern part of the county north of Grady. The field was 71.1 acres and the previous crop was soybeans. The soil type was Herbert Silt Loam. Chicken litter was applied at a rate of 2 tons per acre in the fall and the field was hipped. On March 21, 50 pounds of Urea (23 units N), 100 pounds of Ammonium Sulfate (21 units N, 24 units S) plus 33 pounds of Zinc Sulfate (10 units Zn) was applied by the producer. The field was then re-hipped with a bedder roller. The field was planted on March 21 with DeKalb DKC 66-87VT2P at 39,000 seeds per acre on 38 inch row spacing followed by 1.2 pints of metolachlor for preemergence weed control. The field emerged on March 31 but between planting and emergence the field received 5 inches of heavy rains. This eroded some of the beds and resulted in scattered rootless corn syndrome across the field. The final plant population was 34,500 plants per acre. On May 28, 225 pounds of Urea (104 units N) plus 100 pounds of Ammonium Sulfate (21 units N, 24 units S) were applied by the producer followed by a middle sweep for irrigation. The field was sprayed on April 29 with 2 quarts of atrazine, 1.5 pts of metolachlor plus 1 quart of glyphosate for weed control. A pre-tassel application of 100 pounds of Urea (46 units N) was aerially applied on May 19 followed by another application of 125 pounds of Urea (58 units N) on June 16. Total fertilizer for the field was 273-100-100-48-10. The field received 18.2 inches of rain from planting to R6 (black layer) and 25.1 inches from planting until harvest. The field was furrow irrigated 9 times. The field was harvested on August 25 at 19.1% moisture and yielded 226.2 bushels per acre adjusted to 15.5% moisture.

## **Pope County**

The Pope County corn research verification field was located in the southeastern part of the county near Atkins. The field was 40.3 acres and the previous crop was soybeans. The soil type was Dardanelle Silt Loam. The field was disked on April 15 and a mixed preplant fertilizer of 74-46-90-24-0 was applied by the producer and bedded in on April 23. The field was planted on April 23 with Pioneer 1319HR at 32,000 seeds per acre on 30 inch row spacing. The field emerged on April 30 and the final plant population was 31,500 plants per acre. 175 pounds of Urea (81 units N), 100 pounds of Ammonium Sulfate (21 units N, 24 units S) plus 100 pounds of potassium (60 units K) was aerially applied on May 21. The producer applied 3.6 pints of Halex GT plus 1 quart of atrazine on May 21 for weed control. A pre-tassel application of 100 pounds of Urea (46 units of N) was applied on June 15. The total fertilizer for the field was 222-46-150-48-0. The field received 11.1 inches of rain from planting until harvest. The field was furrow irrigated 3 times. The field was harvested for silage on July 25 and yielded 36 tons of silage per acre.

## **Prairie County**

The Prairie County corn research verification field was located in the northern part of the county west of Des Arc. The field was 63 acres and the previous crop was soybeans. The soil type was Immanuel Silt Loam. The field was disked and floated in the fall followed by a chisel plow and field cultivation in the spring. A mixed preplant fertilizer of 39-46-60-24-0 was custom applied on March 28 then bedded into a 60 inch bed. The field was planted on March 29 with Armor 1555PRO2 at 35,000 seeds per acre on 30 inch row spacing. The field emerged on April 12 and the final plant population was 32,000 plants per acre. The producer applied 1.5 pints of metolachlor plus 1 quart of glyphosate on April 26 followed by 300 pounds of Urea (138 units N) aerially applied. The field was sprayed on May 12 with 1.5 quarts of atrazine. A pre-tassel application of 100 pounds of Urea (46 units N) was aerially applied on May 31. Total fertilizer for the field was 223-46-60-24-0. The field received 19.3 inches of rain from planting to R6 (black layer) and 27.1 inches from planting until harvest. The field was furrow irrigated 7 times. The field was harvested on September 3 at 14.5% moisture and yielded 192.3 bushels per acre adjusted to 15.5% moisture.

## **River Valley**

The River Valley corn research verification field was located in the southwest part of Conway County near Blackwell. This field was a collaborative effort between agents in Conway, Faulkner, Logan, Perry, Pope and Yell counties. The field was 40.5 acres and the previous crop was corn. The soil type was Dardanelle Silt Loam. The field was disked and field cultivated in the spring. On April 8, 100 pounds of Urea (46 units N) plus 100 pounds of Ammonium Sulfate (21 units N, 24 units S) was applied by the producer and bedded after application. The field was planted on April 8 with Terral REV 23BHR55 at 32,000 seeds per acre on 30 inch row spacing. The field emerged on April 17 and the final plant population was 32,000 plants per acre. The producer applied 230 pounds of Urea (106 units N) on April 27 followed by 3.6 pints of Halex GT plus 1.5 quarts of atrazine for weed control. A pre-tassel application of 100 pounds of Urea (46 units N) was aerially applied on May 31. Total fertilizer for the field was 219-0-0-24-0. The field received 15.8 inches of rain from planting to R6 (black layer) and 23.5 inches from planting until harvest. The field was furrow irrigated 7 times. The field was harvested on September 14 at 12.8% moisture and yielded 192.4 bushels per acre adjusted to 15.5% moisture.



## **St Francis County**

The St Francis County corn research verification field was located in the western part of the county south of Widener. The field was 64.8 acres and the previous crop was soybeans. The soil type was Bowdre Silty Clay Loam. The field was field cultivated in February. On March 21, 100 pounds of Urea (46 units N) plus 100 pounds of Ammonium Sulfate (21 units N, 24 units S) was custom applied and field cultivated in. The field was planted on March 22 with Pioneer 2089YHR at 35,000 seeds per acre on 38 inch twin row spacing. The field emerged on April 4 and the final plant population was 32,500 plants per acre. 250 pounds of Urea (115 units N) plus 100 pounds of ammonium sulfate (21 units N, 24 units S) was custom applied on April 25. On May 5, 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 June 7. Total fertilizer for this field was 249-0-0-48-0. The field received 21.5 inches of rain from planting to R6 (black layer) and 23.4 inches from planting until harvest. The field was pivot irrigated 11 times. The field was harvested on August 31 at 15.5% moisture and yielded 172.3 bushels per acre adjusted to 15.5% moisture.

## GRAIN SORGHUM FIELD REVIEW

### Jefferson County

The Jefferson County grain sorghum research verification field was located in the northern part of the county near Sherrill. The field was 33.9 acres and previous crop was grain sorghum. The soil type was McGehee/Rilla Silt Loam. The field was disked then and a preplant fertilizer of 21-80-60-24-0 was custom applied on April 27. The field was bedded on 60 inch beds and planted on April 28 with Armor Maverick at 8 pounds (approximately 100,000 seeds/acre) per acre on 30 inch spacing. The field emerged on May 8 and the plant stand was less than optimum due to planter issues. The final plant population was 37,000 plants per acre but it was evenly distributed so the final recommendation was to keep the stand. 1.5 pints of metolachlor was custom applied on May 9. On June 1, 250 pounds of Urea (115 units N) was custom applied. Total fertilizer for the field was 136-80-60-24-0. Frequent rains delayed weed control. 1.5 quarts of atrazine plus 15 ounces of Huskie was applied on June 12. The field was sprayed with 14 ounces of Prevathon on July 27 for headworm control. As the field reached maturity in mid-August, rains began to fall which led to the seed sprouting while still on the head. Some of this seed shattered from the head leading to decreased yield and the seed that stayed on the head was low quality. The field received 15.9 inches of rain from planting to maturity and 21.1 inches from planting until harvest. The field was furrow irrigated 2 times. The field was harvested on September 15 at 14.4% moisture and yielded 75.2 bushels per acre adjusted to 14% moisture.

### White County

The White County grain sorghum research verification field was located in the northern part of the county near Bald Knob. The field was 51.9 acres and previous crop was soybeans. The soil type was Calhoun Silt Loam. The field was subsoiled in the fall. A burndown application of 32 ounces of Roundup plus 24 ounces of 2,4-D was applied on March 31. The field was field cultivated on April 22 followed by a mixed preplant fertilizer of 23-0-60-0-0. The field was field cultivated again on April 23 and then planted with Pioneer 83P99 at 6 pounds per acre (approximately 75,000 seeds/acre) on 30 inch row spacing. 1.5 pints of metolachlor was applied by the producer on April 24. A flush of pigweeds was noticed a few days after the metolachlor application so since the field had not emerged yet 1 quart of Gramoxone was applied by the producer. The field emerged on May 1. The final plant population was 61,500 plants per acre. 1.1 quarts of atrazine was applied by the producer on May 15 for another flush of pigweeds. On May 19, 200 pounds of Urea (92 units N) was custom applied. Total fertilizer for the field was 115-0-60-0-0. In early June, another flush of pigweeds emerged so 1.4 quarts of atrazine was custom applied. The field was sprayed with 14 ounces of Prevathon on July 22 for headworm control. As the field reached maturity in mid-August, rains began to fall which led to the seed sprouting while still on the head. Some of this seed shattered from the head leading to decreased yield and the seed that stayed on the head was low quality. The field received 16.3 inches of rain from planting to maturity and 17.3 inches from planting until harvest. The field was non-irrigated. The field was harvested on September 6 at 13.7% moisture and yielded 48.1 bushels per acre adjusted to 14% moisture.

**Table 1. Agronomic information for the 2016 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)
Clay	Pioneer 1637YHR <sup>1</sup>	35.2	30"	Soybeans	34,500	33,000	April 25	May 7	September 13	175.3
Lincoln	DeKalb 66-87VT2P <sup>2</sup>	71.1	38"	Soybeans	37,000	34,500	March 21	March 31	August 25	226.2
Pope	Pioneer 1319HR <sup>3</sup>	40.3	30"	Soybeans	32,000	31,500	April 23	April 30	July 25	36 tons
Prairie	Armor 1555PRO <sup>2</sup>	63.0	30"	Soybeans	35,000	32,000	March 29	April 12	September 3	192.3
River Valley	Terral REV 23BHR55 <sup>1</sup>	40.5	30"	Corn	32,000	32,000	April 8	April 17	September 14	192.4
St Francis	Pioneer 2089YHR <sup>1</sup>	64.8	38" twin	Soybeans	35,000	32,500	March 22	April 4	August 31	172.3
<b>Average</b>		<b>52.5</b>			<b>34,000</b>	<b>32,500</b>	<b>April 5</b>	<b>April 16</b>	<b>September 4</b>	<b>191.7</b>

Traits – <sup>1</sup> YieldGard, Herculex I, Roundup Ready Corn 2, Liberty Link

<sup>2</sup> Genuity VT Double Pro

<sup>3</sup> Herculex I, Roundup Ready Corn 2, Liberty Link

**Table 2. Agronomic information for the 2016 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)
Jefferson	Maverick	33.9	30"	Grain Sorghum	8	37,000	April 28	May 8	September 15	75.2
White	Pioneer 83P99	51.9	30"	Soybeans	6	61,500	April 23	May 1	September 6	48.1
<b>Average</b>		<b>42.9</b>					<b>April 25</b>	<b>May 5</b>	<b>September 10</b>	<b>61.7</b>

**Table 3. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2016 Corn Research Verification Fields.**

County	Soil Test (lb/ac)					Applied Fertilizer N-P-K-S-Zn <sup>1</sup> (lb/ac)			Total Applied Fertilizer N-P-K-S-Zn	Soil Classification
	pH	P	K	S	Zn	Preplant	Sidedress	Pre Tassel		
Clay	7.3	48	168	14	18.2	102-45-114-12-10	121-0-0-12-0	46-0-0-0-0	269-45-114-24-10	Falaya Silt Loam
Lincoln	7.3	176	384	18	4.6	44-100-100-24-10	171-0-0-24-0	58-0-0-0-0	273-100-100-48-10	Herbert Silt Loam
Pope	5.9	92	164	24	4.8	74-46-90-24-0	102-0-60-24-0	46-0-0-0-0	222-46-150-48-0	Dardanelle Silt Loam
Prairie	7.7	46	182	26	10.8	39-46-60-24-0	138-0-0-0-0	46-0-0-0-0	223-46-60-24-0	Immanuel Silt Loam
River Valley	6.6	156	364	16	14.6	67-0-0-24-0	106-0-0-0-0	46-0-0-0-0	219-0-0-24-0	Dardanelle Silt Loam
St Francis	6.2	148	380	10	10.6	67-0-0-24-0	136-0-0-24-0	46-0-0-0-0	249-0-0-48-0	Bowdre Silty Clay Loam
Clay	7.3	48	168	14	18.2	102-45-114-12-10	121-0-0-12-0	46-0-0-0-0	269-45-114-24-10	Falaya Silt Loam

**Table 4. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2016 Grain Sorghum Research Verification Fields.**

County	Soil Test (lb/ac)					Applied Fertilizer N-P-K-S-Zn <sup>1</sup> (lb/ac)		Total Applied Fertilizer N-P-K-S-Zn	Soil Classification
	pH	P	K	S	Zn	Preplant	Sidedress		
Jefferson	7.5	67	183	21	6.2	21-80-60-24-0	115-0-0-0-0	136-80-60-24-0	Rilla Silt Loam
White	6.5	86	210	18	3.0	23-0-60-0-0	92-0-0-0-0	115-0-60-0-0	Calhoun Silt Loam

<sup>1</sup> N=nitrogen, P= phosphorus, K=potassium, S=sulfur and Zn=zinc.

**Table 5. Pesticide information for the 2016 Corn Research Verification fields.**

County	Herbicide	Insecticide	Fungicide
Clay	1 qt glyphosate + 1.25 pts metolachlor – March 30 1.5 qts atrazine + 3.6 pts Halex GT – June 2	None	None
Lincoln	1.2 pts metolachlor – March 21 2 qts atrazine, 1.5 pts metolachlor + 1 qt glyphosate – April 29	None	None
Pope	1 qt atrazine + 3.6 pts Halex GT – May 21	None	None
Prairie	1 qt glyphosate + 1.5 pt metolachlor – April 26 1.5 qts atrazine – May 12	None	None
River Valley	3.6 pts Halex GT + 1.5 qts atrazine – April 27	None	None
St Francis	3.6 pts Halex GT + 1.5 qts atrazine – May 5	None	None

**Table 6. Pesticide information for the 2016 Grain Sorghum Research Verification field.**

County	Herbicide	Insecticide	Fungicide
Jefferson	1.5 pts metolachlor – May 9 1.5 qts atrazine + 15 oz Huskie – June 12	14 oz Prevathon – July 27	None
White	1.5 pts metolachlor – April 25 1 qt Gramoxone – April 28 1.1 qts atrazine – May 15 1.4 qts atrazine – June 9 40 oz Roundup – August 29	14 oz Prevathon – July 22	None

**Table 7. Irrigation information and rainfall for the 2016 Corn Research Verification Fields.**

County	Irrigation Type	Number of Irrigations	Rainfall (in) Planting to Black Layer (R6)	Rainfall (in) Planting to Harvest
Clay	Furrow	5	21.7	22.9
Lincoln	Furrow	9	18.2	25.1
Pope	Furrow	3	---	11.1
Prairie	Furrow	7	19.3	27.1
River Valley	Furrow	7	15.8	23.5
St Francis	Pivot	11	21.5	23.4

\*Field was harvested for silage and didn't reach R6.

**Table 8. Irrigation information and rainfall for the 2016 Grain Sorghum Research Verification Fields.**

County	Irrigation Type	Number of Irrigations	Rainfall (in) Planting to Maturity	Rainfall (in) Planting to Harvest
Jefferson	Furrow	2	15.9	21.1
White	Non Irrigated	---	16.3	17.3

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

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

**Table 9. Corn growth stages and corresponding Growing Degree Days for the 2016 Corn Research Verification Fields**

Growth Stage	Accumulated Growing Degree Days (GDD50)						
	Clay	Lincoln	Pope	Prairie	River Valley	St Francis	Average
VE	216	142	153	183	123	148	161
V2	353	324	261	306	288	284	303
V4	526	500	418	518	442	479	481
V6	703	673	623	635	586	609	638
V8	869	857	824	822	720	777	812
V10	1007	961	951	985	886	918	951
V12	1095	1075	1056	1116	959	1044	1058
V14	1212	1205	1145	1224	1062	1176	1171
V16	1333	1311	1268	1300	1136	1285	1272
R1	1577	1496	1450	1563	1447	1497	1505
R2	1783	1704	1592	1715	1595	1671	1677
R3	1985	1853	1740	1869	1768	1825	1840
R4	2134	2003	1890	2011	1942	1995	1996
R5	2254	2175	2061	2135	2119	2178	2154
R6	2909	2999	*	2886	2778	2989	2912

\* Field was harvested for silage and didn't reach R6.

## Economic Analysis – Dr. Archie Flanders

This section provides information on production costs for the 2016 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 7 fields (5 corn for grain harvest 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 2016 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, and 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 representative 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 in Table 12. Price received for corn of \$3.35/bu is the 2016 average for the most active weeks of the harvest period. The corresponding average price for grain sorghum is \$2.95/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 191.7 bu/acre and the grain sorghum yield is 61.7 bu/acre.

Average production expenses for the corn fields harvested for grain in Table 11 are \$419.58 per acre. Table 11 indicates that fertilizers and nutrients are the largest expense category at \$144.28 per acre, or 34% of production expenses. Seed costs average \$138.65 which is 33% of production expenses.

With average grain yield of 191.7 bu/acre, average operating costs are \$2.71/bu in Table 10. Operating costs range from a low of \$416.47 in the River Valley field to a high of \$619.50 in Clay County. Returns to operating costs average \$126.39 per acre. Returns to operating costs have a low of -\$32.24 in Clay County and a high of \$228.07 in the River Valley field. Average fixed costs are \$104.34 which leads to average total costs of \$620.15 per acre. Returns to total costs average \$22.04 per acre with a low of -\$142.36 in Clay County and a high of \$131.58 in the River Valley field. Total specified costs average \$3.26/bu.

The two grain sorghum fields have average production expenses of \$258.14 per acre in Table 12. Fertilizers and nutrients are 32% of production expenses costs with an average expense of \$81.56 per acre in Table 12. Operating expenses average \$283.30 which is \$4.70/bu as determined by the average yield. Returns to operating costs average -\$98.43 per acre. Fixed costs average \$64.73, and this leads to average total costs of \$345.03, or \$5.80/bu. Returns to total specified costs average -\$163.16 per acre.



**Table 10. Operating Costs, Total Costs, and Returns, 2016 Corn & Grain Sorghum RVP**

<b>Corn</b>							
Field	Operating Costs	Operating Costs per Bu.	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs per Bu.
Clay	619.50	3.53	-32.24	110.11	729.61	-142.36	4.16
Lincoln	587.94	2.60	169.83	98.84	686.78	70.99	3.04
Prairie	508.50	2.64	135.70	101.35	609.86	34.35	3.17
River Valley	416.47	2.16	228.07	96.49	512.96	131.58	2.67
St. Francis	446.63	2.59	130.58	114.92	561.55	15.65	3.26
<b>Average</b>	<b>515.81</b>	<b>2.71</b>	<b>126.39</b>	<b>104.34</b>	<b>620.15</b>	<b>22.04</b>	<b>3.26</b>
<b>Grain Sorghum</b>							
White	259.68	5.40	-117.78	62.54	322.22	-180.32	6.70
Jefferson	300.92	4.00	-79.08	66.92	367.84	-146.00	4.89
<b>Average</b>	<b>280.30</b>	<b>4.70</b>	<b>-98.43</b>	<b>64.73</b>	<b>345.03</b>	<b>-163.16</b>	<b>5.80</b>

**Table 11. Summary of Revenue and Expenses per Acre, 2016 Corn RVP**

Revenue	Field					Average
	Clay	Lincoln	Prairie	River Valley	St. Francis	
Yield: Grain (bu.)	175.3	226.2	192.3	192.4	172.3	191.7
Price: Grain (\$/bu.)	3.35	3.35	3.35	3.35	3.35	3.35
<b>Total Crop Revenue</b>	<b>587.26</b>	<b>757.77</b>	<b>644.21</b>	<b>644.54</b>	<b>577.21</b>	<b>642.20</b>
<b>Expenses</b>						
Seed	163.09	146.64	131.60	120.32	131.60	138.65
Fertilizers & Nutrients	217.45	183.00	127.75	86.95	106.25	144.28
Herbicides	50.01	46.01	29.76	30.75	30.75	37.45
Insecticides	0.00	0.00	0.00	0.00	0.00	0.00
Custom Applications	19.00	15.75	41.00	7.00	19.00	20.35
Other Inputs	3.50	3.50	3.50	3.50	0.00	2.80
Diesel Fuel	12.17	9.90	13.82	9.77	5.92	10.31
Irrigation Energy Costs	14.76	26.58	20.16	20.67	24.67	21.37
<b>Input Costs</b>	<b>479.98</b>	<b>431.37</b>	<b>367.59</b>	<b>278.96</b>	<b>318.19</b>	<b>375.22</b>
Fees	13.00	13.00	13.00	13.00	13.00	13.00
Repairs & Maintenance <sup>1</sup>	22.32	20.18	19.91	20.56	21.44	20.88
Labor, Field Activities	12.77	10.33	11.68	9.72	7.90	10.48
<b>Production Expenses</b>	<b>528.07</b>	<b>474.87</b>	<b>412.18</b>	<b>322.24</b>	<b>360.53</b>	<b>419.58</b>
Interest	12.54	11.28	9.79	7.65	8.56	9.96
Post-harvest Expenses	78.89	101.79	86.54	86.58	77.54	86.27
<b>Total Operating Expenses</b>	<b>619.50</b>	<b>587.94</b>	<b>508.50</b>	<b>416.47</b>	<b>446.63</b>	<b>515.81</b>
<b>Returns to Operating Expenses</b>	<b>-32.24</b>	<b>169.83</b>	<b>135.70</b>	<b>228.07</b>	<b>130.58</b>	<b>126.39</b>
Capital Recovery & Fixed Costs	110.11	98.84	101.35	96.49	114.92	104.34
<b>Total Specified Expenses<sup>2</sup></b>	<b>729.61</b>	<b>686.78</b>	<b>609.86</b>	<b>512.96</b>	<b>561.55</b>	<b>620.15</b>
<b>Returns to Specified Expenses</b>	<b>-142.36</b>	<b>70.99</b>	<b>34.35</b>	<b>131.58</b>	<b>15.65</b>	<b>22.04</b>
Operating Expenses/bu.	3.53	2.60	2.64	2.16	2.59	2.71
Total Specified Expenses/bu.	4.16	3.04	3.17	2.67	3.26	3.26

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

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

**Table 12. Summary of Revenue and Expenses per Acre, 2016 Grain Sorghum RVP**

Revenue	Field		
	White	Jefferson	Average
Yield (bu.)	48.1	75.2	61.7
Price (\$/bu.)	2.95	2.95	2.95
<b>Total Crop Revenue</b>	<b>141.90</b>	<b>221.84</b>	<b>181.87</b>
<b>Expenses</b>			
Seed	22.32	29.76	26.04
Fertilizers & Nutrients	56.50	106.63	81.56
Herbicides	59.41	36.68	48.04
Insecticides	18.76	18.76	18.76
Other Chemicals	0.00	0.00	0.00
Custom Applications	40.00	31.00	35.50
Other Inputs	0.00	3.50	1.75
Diesel Fuel	9.21	7.78	8.50
Irrigation Energy Costs	0.00	5.91	2.95
<b>Input Costs</b>	<b>206.20</b>	<b>240.01</b>	<b>223.10</b>
Fees	13.00	13.00	13.00
Repairs & Maintenance <sup>1</sup>	12.87	12.51	12.69
Labor, Field Activities	9.37	9.33	9.35
<b>Production Expenses</b>	<b>241.44</b>	<b>274.84</b>	<b>258.14</b>
Interest	5.73	6.53	6.13
Post-harvest Expenses	12.51	19.55	16.03
<b>Total Operating Expenses</b>	<b>259.68</b>	<b>300.92</b>	<b>280.30</b>
<b>Returns to Operating Expenses</b>	<b>-117.78</b>	<b>-79.08</b>	<b>-98.43</b>
Capital Recovery & Fixed Costs	62.54	66.92	64.73
<b>Total Specified Expenses<sup>2</sup></b>	<b>322.22</b>	<b>367.84</b>	<b>345.03</b>
<b>Returns to Specified Expenses</b>	<b>-180.32</b>	<b>-146.00</b>	<b>-163.16</b>
Operating Expenses/bu.	5.40	4.00	4.70
Total Specified Expenses/bu.	6.70	4.89	5.80

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

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