



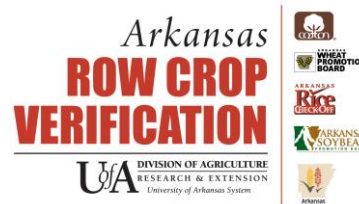
**DIVISION OF AGRICULTURE
RESEARCH & EXTENSION**

University of Arkansas System

**2014
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
U.S. Department of Agriculture
And County Governments Cooperating



The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.

Table of Contents

	Page
Authors and Acknowledgments.....	2
Introduction.....	3
Figure 1. Location of the 2014 Corn and Grain Sorghum Research Verification Fields.....	4
Corn Field Reviews, Arkansas, Clay and Jefferson Counties.....	5
Corn Field Reviews, Lee, Lonoke and Mississippi Counties.....	6
Corn Field Reviews, St Francis and White Counties.....	7
Grain Sorghum Field Reviews, Chicot and Prairie Counties.....	8
Tables 1 & 2. Agronomic information for the 2014 Research Verification Fields.....	9
Tables 3 & 4. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2014 Research Verification Fields	10
Tables 5 & 6. Pesticide information for the 2014 Research Verification Fields.....	11
Tables 7 & 8. Irrigation information and rainfall for the 2014 Research Verification Fields.....	12
Economic Analysis.....	13
Table 9. Operating Costs, Total Costs, Costs per Bushel, and Returns for the 2014 Research Verification Fields.....	14
Table 10. Summary of Revenue and Expenses per Acre for the 2014 Corn Research Verification Fields.....	15
Table 11. Summary of Revenue and Expenses per Acre for the 2014 Grain Sorghum Research Verification Field.....	16

CORN & GRAIN SORGHUM RESEARCH VERIFICATION PROGRAM, 2014

Conducted by:

Mr. Kevin Lawson, Program Associate
Dr. Jason Kelley, Extension Agronomist – Wheat and Feed Grains
Dr. Archie Flanders – Extension Economists

Acknowledgments:

Cooperating Corn and Grain Sorghum Producers:

Lloyd Inman – Arkansas County	Jeff Smith – Lonoke County
Clay Poole – Chicot County	Brandon Veach – Mississippi County
Drew Woolverton – Clay County	Jeffery Reidhar – Prairie County
Keith Woolverton – Clay County	Brian McDaniel – St Francis County
Kris Baker – Jefferson County	Keith Watkins – White County
Keith Freeland – Lee County	

Cooperating County Extension Agents:

Chuck Capps – Arkansas County	Keith Perkins – Lonoke County
Gus Wilson – Chicot County	Ray Benson – Mississippi County
Andy Vangilder – Clay County	Brent Griffin – Prairie County
Anthony Whittington – Jefferson County	Mitch Crow – St Francis County
Zach Hill – Jefferson County	Brett Gordon – White County
Stan Baker – Lee County	Brian Haller – White County

Cooperative Extension Service:

Dr. Trenton Roberts, Extension Soils Specialist
Dr. Leo Espinoza, Extension Soils Specialist
Dr. Travis Faske, Extension Plant Pathologist
Dr. Glenn Studebaker, Extension Entomologist
Dr. Tom Barber, Extension Weed Scientist
Dr. Chris Henry, Extension Irrigation Specialist
Mr. Chris Meux, Extension Design Specialist

Agricultural Experiment Station:

Dr. Paul McLeod, Department of Entomology

Arkansas Corn and Grain Sorghum Promotion Board:

Mr. Trent Dabbs (Chairman)	Mr. Jon Carroll
Mr. Mike Richardson (Vice Chairman)	Mr. Tommy Young
Mr. Stewart Weaver (Secretary/Treasurer)	Mr. Keith Woolverton
Mr. David Gammill	

INTRODUCTION

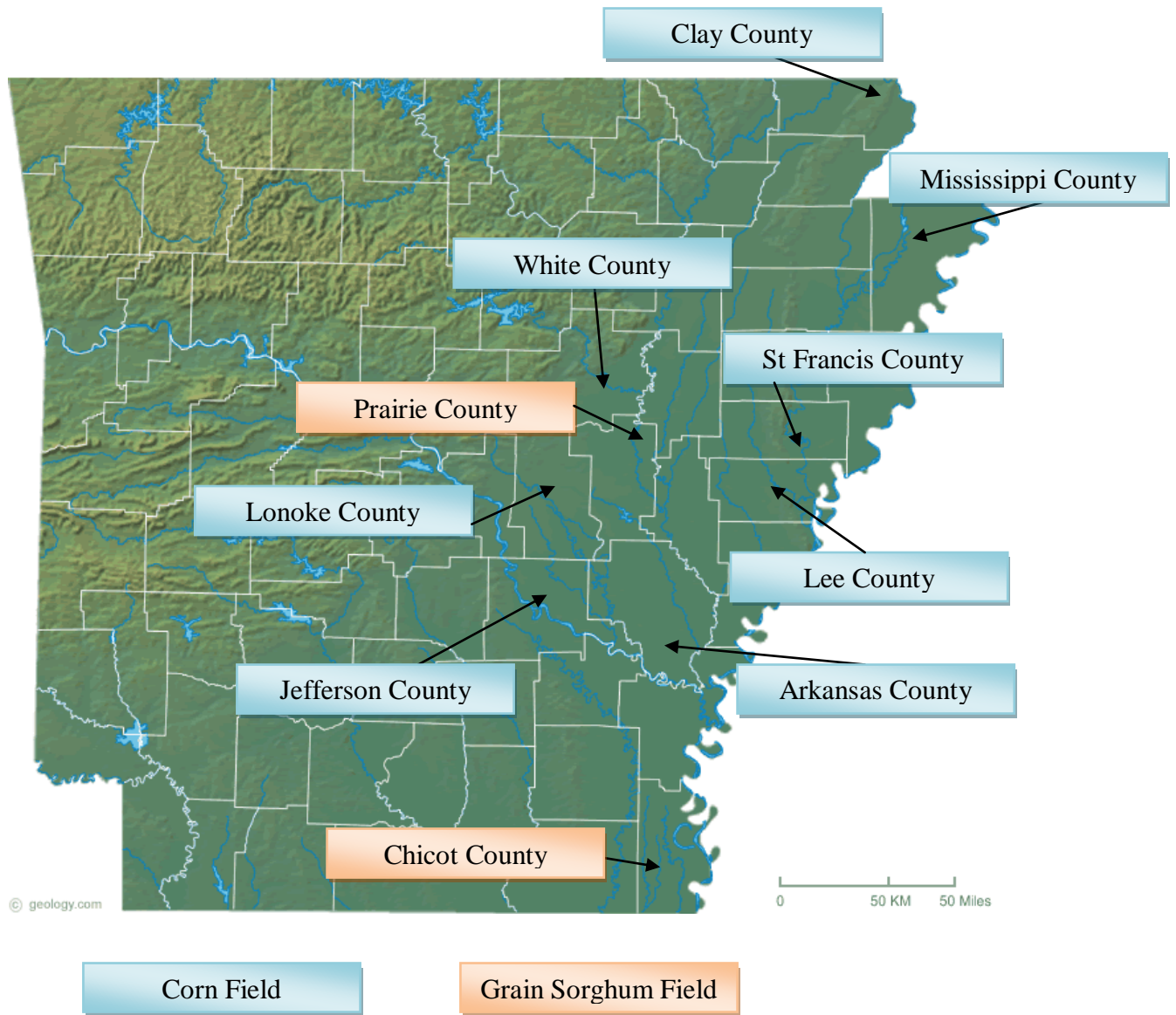
The 2014 growing season was the fifteenth year for the Corn and Grain Sorghum Research Verification Program (CGSRVP). The CGSRVP is an interdisciplinary effort between growers, county Extension agents, Extension specialists, and researchers. The CGSRVP is an on-farm demonstration of all the research-based 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. Ten growers enrolled in the CGSRVP in the spring of 2014, eight corn and two grain sorghum fields. The fields were located on commercial farms and ranged in size from 37.5 to 73.5 acres for the corn fields with an average field size of 56.4 acres. The grain sorghum fields were 58.5 and 15.4 acres.

The 2014 CGSRVP corn fields were in Arkansas, Clay, Jefferson, Lee, Lonoke, Mississippi, St Francis and White Counties; and the grain sorghum fields were in Chicot and Prairie Counties. Eight different corn hybrids (Armor 1330, Armor 1550PRO, DeKalb DKC 62-08, DeKalb DKC 64-69, DeKalb DKC 64-83, DeKalb DKC 66-87, Pioneer P2089YHR and Terral REV 26BHR50) and two grain sorghum hybrids (Dyna-Gro 756B and Pioneer 84P80) were planted. Management decisions were based on field history, soil test results, hybrids, and data collected from each individual field during the growing season.

Figure 1. Location of 2014 Corn and Grain Sorghum Research Verification Fields



CORN FIELD REVIEWS

Arkansas County

The Arkansas County corn research verification field was located in the south part of the county just southeast of DeWitt. The field was 73.5 acres and the previous crop was soybeans. The soil type was Immanuel Silt Loam. The field was disked, chisel plowed and then floated. A mixed preplant fertilizer of 65-0-60-0-10 was applied on April 18 and cultivated in. The field was hipped and planted on April 19 with DeKalb DKC 64-69 at 34,000 seeds per acre with a twin row planter on 38 inch beds. The field emerged on April 27 and the final plant stand was 34,000 plants per acre. On May 7, 3.6 pints of Halex GT plus 1.5 quarts of atrazine was custom applied for weed control. 250 pounds of Urea (115 units of N) was custom applied on May 8. A pretassel application of 100 pounds of Urea (46 units) was applied on June 5. Total fertilizer for this field was 226-0-60-0-10. The field received 16.15 inches of rain from planting to R6 (black layer) and was furrow irrigated 4 times. Greensnap damage from high winds in June storms was estimated at 15%. The field was harvested on September 11 at 15.1% moisture and yielded 247.5 bushels per acre adjusted to 15.5% moisture.

Clay County

The Clay County corn research verification field was located in the northeastern part of the county near Pollard. The field was 57 acres and the previous crop was soybeans. The soil type was Faylaya Silt Loam. The field was turbo tilled on April 1. A mixed preplant fertilizer of 70-23-60-24-0 was custom applied on April 2 followed by turbo tillage, field cultivation and hipped. The field was planted on April 2 with DeKalb DKC 63-87 at 34,000 seeds per acre on 30 inch row spacing. The field emerged on April 18. The producer applied 1 quart of glyphosate, 1 quart of atrazine plus 1.3 pints of Dual on April 19 for weed control. The field was damaged 6.50 inches of rain in late April that washed away all the beds and destroyed the stand. The producer turbo tilled the field on May 5 followed by hipping. The field was replanted on May 7 with DeKalb DKC 64-83 at 34,000 seeds per acre. The field emerged on May 15 and the final plant stand was 34,500 plants per acre. 50 pounds of Urea (23 units of N) plus 50 lbs of ammonium sulfate (10.5 units of N, 12 units of S) was custom applied on June 2, followed by 40 gallons of 32% (140 units N) applied by the producer. Total fertilizer for this field was 244-23-60-24-0. The producer applied 3.6 pints of Halex GT plus 1.5 quarts of atrazine on June 3 for weed control. The field received 13.51 inches of rain from replanting to R6 (black layer) and was furrow irrigated 5 times. The field was harvested on September 26 at 18.4% moisture and yielded 227.6 bushels per acre adjusted to 15.5% moisture.

Jefferson County

The Jefferson County corn research verification field was located in the central part of the county near Sherrill. The field was 55.6 acres and the previous crop was soybeans. The soil type was Caspiana Silt Loam. The field was field cultivated and floated on April 18. A mixed preplant fertilizer of 80-40-92-0-0 was variably rate applied on April 19, and then the field was bedded. The field was planted on April 25 with DeKalb DKC 62-08 at 34,000 seeds per acre on 30 inch row spacing. The field emerged on April 25 and the final plant stand was 34,000 plants per acre. 50 pounds of Urea (23 units N) plus 100 pounds of 18-46-0 (18 units N, 46 units P) was custom applied on May 8. A sidedress of 30 gallons of 32% (105 units of N) was applied by the producer on May 22. Total fertilizer for the field was 226-86-92-0-0. On May 22 the producer applied 3.6 pints of Halex GT plus 2 quarts of atrazine for weed control. The field received 17.15 inches of rain from planting to R6 (black layer) and was furrow irrigated 5 times. The field was harvested on September 19 at 16.4% moisture and yielded 248.4 bushels per acre adjusted to 15.5% moisture.

Lee County

The Lee County corn research verification field was located in the central part of the county just north of Moro. The field was 47.3 acres and the previous crop was soybeans. The soil type was Calloway Silt Loam. The field was field cultivated, ripped and then field cultivated again. A mixed preplant fertilizer of 65-100-120-0-10 was custom applied on April 13 and bedded in. The field was planted on April 13 with DeKalb DKC 66-97 at 33,000 seeds per acre with 38 inch row spacing followed by a custom application of 1.3 pints of Dual. The field emerged on April 25 and the final plant stand was 31,500 plants per acre. 250 pounds of Urea (115 units of N) was custom applied on May 21. On May 23, 1 quart of glyphosate plus 1.5 quarts of atrazine was custom applied for weed control. A pretassel application of 100 pounds of Urea (46 units) was applied on June 13. Total fertilizer for this field was 226-100-120-0-10. The field received 22.38 inches of rain from planting to R6 (black layer) and was furrow irrigated 4 times. The field was harvested on September 13 at 17.2% moisture and yielded 202.5 bushels per acre adjusted to 15.5% moisture.

Lonoke County

The Lonoke County corn research verification field was located in the central part of the county just south of Lonoke. The field was 39.2 acres and the previous crop was soybeans. The soil type was Calhoun Silt Loam. The field was disked, turbo tilled twice and floated. A mixed preplant fertilizer of 69-0-60-0-6 was custom applied on April 12 and bedded in. The field was planted on April 12 with Armor 1330 (conventional hybrid) at 34,000 seeds per acre with 30 inch row spacing followed by a custom application of 1.3 pints of Dual. The field emerged on April 22 and the final plant stand was 33,500 plants per acre. On May 20, 1.5 quarts of atrazine plus 1.3 pints of Dual was custom applied for weed control. 180 pounds of Urea (83 units of N) plus 100 pounds of ammonium sulfate (21 units of N, 24 units of S) was custom applied on May 25. A pretassel application of 100 pounds of Urea (46 units) was applied on June 12. Total fertilizer for this field was 219-0-60-24-6. The field received 18.19 inches of rain from planting to R6 (black layer) and was furrow irrigated 5 times. Greensnap damage from high winds in June storms was estimated at 15%. The field was harvested on September 4 at 16.1% moisture and yielded 188.5 bushels per acre adjusted to 15.5% moisture.

Mississippi County

The Mississippi County corn research verification field was located in the eastern part of the county south of Manila. The field was 72.4 acres and the previous crop was soybeans. The soil type was Crevasse Loamy Sand. The field was hipped and rolled on March 24. The field was planted on April 11 with Pioneer P2089YHR at 37,000 seeds per acre on 38 inch row spacing. The field emerged on April 22 and the final plant stand was 36,500 plants per acre. A mixed fertilizer of 65-0-75-24-0 was custom applied on May 7. The field was sprayed on May 7 with 1 quart of glyphosate plus 1 quart of atrazine for weed control. On May 23, 240 pounds of Urea (110 units of N) was custom applied followed by 1 quart of glyphosate plus 1 quart of atrazine for weed control. A pretassel application of 100 pounds of Urea (46 units of N) was applied on June 14. Total fertilizer for the field was 221-0-75-24-0. The field received 15.45 inches of rain from planting to R6 (black layer) and was pivot irrigated 3 times. Greensnap damage from high winds in June storms was estimated at 25%. The field was harvested on September 16 at 16.0% moisture and yielded 206.1 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 68.4 acres and the previous crop was cotton. The soil type was a mix of Dubbs Fine Sandy Loam and Earle Clay. The field was field cultivated and bedded. The field was planted on April 11 with Terral REV 26BHR50 at 37,000 seeds per acre with 38 inch row spacing and an application of 40 ounces of Sequence was applied with the planter. A mixed fertilizer of 80-90-90-0-0 was custom applied on April 13. The field emerged on April 21 and the final plant stand was 36,500 plants per acre. On May 19, 3.6 pints of Halex GT was applied by the producer for weed control. 200 pounds of Urea (92 units of N) plus 100 pounds of ammonium sulfate (21 units of N, 24 units of S) was custom applied on June 4. A pretassel application of 100 pounds of Urea (46 units) was applied on June 18. Total fertilizer for this field was 239-90-90-24-0. The field received 23.90 inches of rain from planting to R6 (black layer) and was pivot irrigated 4 times. The field was harvested on September 26 at 13.4% moisture and yielded 245.2 bushels per acre adjusted to 15.5% moisture.

White County

The White County corn research verification field was located in the southern part of the county near Griffithville. The field was 37.5 acres and the previous crop was soybeans. The soil type was Calhoun Silt Loam. The field was field cultivated and a mixed preplant fertilizer of 65-0-85-0-5 was custom applied and bedded in on April 4. The field was planted on April 5 with Armor 1550PRO at 34,000 seeds per acre on 30 inch row spacing. The field emerged on April 18 and the final plant population was 31,000 plants per acre. 230 pounds of Urea (106 units of N) was custom applied on May 6. The producer applied 3.6 pints of Halex GT plus 2 quarts of atrazine on May 22 for weed control. A pretassel application of 100 pounds of Urea (46 units of N) was applied on June 5. The total fertilizer for the field was 217-0-85-0-5. The field received 21.50 inches of rain from planting to R6 (black layer) and was furrow irrigated 5 times. Greensnap damage from high winds in June storms was estimated at 48%. The field was harvested on August 27 at 18.4% moisture and yielded 156.8 bushels per acre adjusted to 15.5% moisture.

GRAIN SORGHUM FIELD REVIEW

Chicot County

The Chicot County grain sorghum research verification field was located in the southern part of the county west of Eudora. The field was 58.5 acres and previous crop was soybeans. The soil type was Perry Clay. The field was hipped in the spring. The field was planted on April 23 with Dyna-Gro 756B at 8 pounds (approximately 100,000 seeds/acre) per acre with a twin row planter on 38 inch spacing. A liquid fertilizer of 4-9-2-0-0 was applied with the planter. 1 pint of Dual plus 40 ounces of Gramaxone was applied on April 23 after planting by the producer. The field emerged on April 29 and the final plant population was 78,500 plants per acre. On May 7, 50 pounds of Urea (23 units of N) plus 100 pounds of ammonium sulfate (21 units of N, 24 units of S) was applied by the producer. 34 gallons of 28% (105 units N) was applied by the producer on May 21. Total fertilizer for the field was 153-9-2-24-0. 1.5 quarts of atrazine was applied by the producer on May 22 for weed control. The field was sprayed with 1 ounce of Tombstone on June 27 for sorghum midge control. The field was sprayed on July 5 with 16 ounces of Dimethoate and again on July 14 with 1.5 ounces of Transform for White Sugarcane Aphids. The field received 15.70 inches of rain from planting to maturity and was furrow irrigated 1 time. 1 quart of glyphosate was applied by air as a harvest aid on August 11. The field was harvested on August 23 at 15.1% moisture and yielded 134.0 bushels per acre adjusted to 14% moisture.

Prairie County

The Prairie County grain sorghum research verification field was located in the northern part of the county east of Des Arc. The field was 15.4 acres and previous crop was soybeans. The soil type was Dewitt Silt Loam. The field was field cultivated on April 20. A mixed preplant fertilizer of 34-0-60-12-0 was applied on April 22 and field cultivated. The field was planted on April 23 with Pioneer 84P80 at 6 pounds per acre (approximately 78,000 seeds/acre) on 15 inch row spacing. 1.3 pints of Dual was custom applied on April 23 after planting. The field emerged on May 2 and the final plant population was 67,000 plants per acre. 1.5 quarts of atrazine was custom applied on May 24 for weed control. On May 35, 175 pounds of Urea (81 units of N) was custom applied. 2.6 ounces of Tombstone was applied on July 10 for sorghum midge control. The field received 18.90 inches of rain from planting to maturity and the field was non-irrigated. The field was harvested on August 29 at 13.2% moisture and yielded 102.2 bushels per acre adjusted to 14% moisture.

Table 1. Agronomic information for the 2014 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	DKC 64-69 VT3P ¹	73.5	38" twin	Soybeans	34,000	34,000	April 19	April 27	September 25	247.5
Clay	DKC 64-83 VT3P ¹	57	30"	Soybeans	34,000	34,500	May 7	May 15	September 28	227.6
Jefferson	DKC 62-08 SS ³	55.6	30"	Soybeans	34,000	34,000	April 19	April 25	September 19	248.4
Lee	DKC 66-87 VT2P ²	47.3	38"	Soybeans	33,000	31,500	April 13	April 25	September 13	202.5
Lonoke	Armor 1330	39.2	30"	Soybeans	34,000	33,500	April 12	April 22	September 4	188.5
Mississippi	Pioneer P2089YHR ⁴	72.4	38"	Soybeans	37,000	36,500	April 11	April 22	September 17	208.5
St Francis	Terral REV 26BHR50 ⁴	68.4	38"	Cotton	37,000	36,500	April 11	April 21	September 26	245.2
White	Armor 1550PRO ¹	37.5	30"	Soybeans	34,000	31,000	April 5	April 18	August 27	156.8
Average		56.4			34,500	34,000	April 15	April 25	September 16	215.6

Traits – 1 Genuity VT Triple Pro

2 Genuity VT Double Pro

3 Genuity SmartStax

4 YieldGard, Herculex I, Roundup Ready Corn 2, Liberty Link

Table 2. Agronomic information for the 2014 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)
-----Irrigated-----										
Chicot	Dyna-Gro 756B	58.5	38" twin	Soybeans	8	78,500	April 23	April 29	August 23	134.0
Prairie	Pioneer 84P80	15.4	15"	Soybeans	6	67,000	April 23	May 2	August 29	102.2

Table 3. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2014 Corn Research Verification Fields.

County	Soil Test (lb/ac)					Applied Fertilizer N-P-K-S-Zn ¹ (lb/ac)			Total Applied Fertilizer N-P-K-S-Zn	Soil Classification
	pH	P	K	S	Zn	Preplant	Sidedress	Pre Tassel		
Arkansas	7.6	78	250	42	8.8	65-0-60-0-10	115-0-0-0-0	46-0-0-0-0	226-0-60-0-10	Immanuel Silt Loam
Clay	6.3	82	368	26.8	17.4	70-23-60-24-0	174-0-0-12-0	0-0-0-0-0	244-23-60-36-0	Falaya Silt Loam
Jefferson	5.9	82	184	16	8.0	80-40-92-0-0	146-46-0-0-0	0-0-0-0-0	226-86-92-0-0	Caspiana Silt Loam
Lee	7.6	30	186	18	2.0	65-100-120-0-10	115-0-0-0-0	46-0-0-0-0	226-100-120-0-10	Calloway Silt Loam
Lonoke	6.3	86	252	42	3.6	69-0-60-0-6	104-0-0-24-0	46-0-0-0-0	219-0-60-24-6	Calhoun Silt Loam
Mississippi	6.1	102	216	14	8.2	65-0-75-24-0	110-0-0-0-0	46-0-0-0-0	221-0-75-24-0	Crevasse loamy sand
St Francis	6.6	83	279	13	4.8	80-90-90-0-0	113-0-0-24-0	46-0-0-0-0	239-90-90-24-0	Dubbs Fine Sandy Loam / Earle Clay
White	7.3	87	219	33	8.5	65-0-85-0-5	106-0-0-0-0	46-0-0-0-0	217-0-85-0-5	Calhoun Silt Loam

Table 4. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2014 Grain Sorghum Research Verification Fields.

County	Soil Test (lb/ac)					Applied Fertilizer N-P-K-S-Zn ¹ (lb/ac)		Total Applied Fertilizer N-P-K-S-Zn	Soil Classification
	pH	P	K	S	Zn	Preplant	Sidedress		
Chicot	7.5	113	598	49	9.1	4-9-2-0-0	149-0-0-24-0	153-9-2-24-0	Perry Clay
Prairie	5.2	61	187	35	12.9	34-0-60-12-0	81-0-0-0-0	115-0-60-12-0	Dewitt Silt Loam

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

Table 5. Pesticide information for the 2014 Corn Research Verification fields.

County	Herbicide	Insecticide	Fungicide
Arkansas	3.6 pts Halex GT + 1.5 qt Atrazine (May 7)	None	None
Clay	1 qt Atrazine, 1 qt Glyphosate + 1.3 pts Dual (April 19) 3.6 pts Halex GT + 1.5 qts Atrazine (June 3)	None	None
Jefferson	3.6 pts Halex GT + 2 qts Atrazine (May22)	None	None
Lee	1.3 pts Dual (April 13) 1.5 qts Atrazine + 1 qt Glyphosate (May 23)	None	None
Lonoke	1.3 pts Dual (April 13) 1.3 pts Dual + 1.5 qts Atrazine (May 20)	None	None
Mississippi	1.3 pts Dual (April 11) 1 qt Atrazine + 1 qt Glyphosate (May 7) 1 qt Atrazine + 1 qt Glyphosate (May 23)	None	None
St Francis	40 oz Sequence (April 11) 3.6 pts Halex GT (May 19)	None	None
White	3.6 pts Halex GT + 2 qts Atrazine (May 22)	None	None

Table 6. . Pesticide information for the 2014 Grain Sorghum Research Verification field.

County	Herbicide	Insecticide	Fungicide
Chicot	1.3 pts of Dual (April 23) 1.5 qts Atrazine (May 22)	1 oz Tombstone (June 27) 1 pt Dimethoate (July 5)	None
Prairie	1.3 pts Dual (April 23) 1.5 qts Atrazine (May 28)	2.6 oz Tombstone (July 10)	None

Table 7. Irrigation information and rainfall for the 2014 Corn Research Verification Fields.

County	Irrigation Type	Number of Irrigations	Rainfall (in) Planting to Black Layer	Rainfall (in) Planting to Harvest
Arkansas	Furrow	4	16.15	18.50
Clay	Furrow	5	13.51	15.25
Jefferson	Furrow	5	17.15	21.70
Lee	Furrow	4	22.38	23.97
Lonoke	Furrow	5	18.19	19.26
Mississippi	Pivot	3	15.45	17.61
St Francis	Pivot	4	23.90	25.58
White	Furrow	5	21.50	22.88

Table 8. Irrigation information and rainfall for the 2014 Grain Sorghum Research Verification Fields.

County	Irrigation Type	Number of Irrigations	Rainfall (in) Planting to Maturity	Rainfall (in) Planting to Harvest
Chicot	Furrow	1	15.70	16.30
Prairie	Non Irrigated		18.90	19.30

*Rainfall amount measured in verification field by weather stations.

*Each furrow irrigation provided approximately 2 acre/inches.

Economic Analysis – Dr. Archie Flanders

This section provides information on production costs for the 2014 CGSRVP. Records of field operations on each field provided the basis for estimating these costs. The field records were compiled by the CGSRVP coordinator, county Extension agents, and cooperators. Production data from the 10 fields (8 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.

Operating expenses are those expenditures that would generally require annual cash outlays and would be included on an annual operating loan application. Actual quantities of all operating inputs as reported by the cooperators are used in this analysis. Input prices are determined by data from the 2014 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 provide unpaid labor for equipment maintenance.

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.

Operating costs, total costs, costs per bushel, and returns are presented in Table 9 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 10. A summary for grain sorghum is in Table 11. Price received for corn of \$3.50/bu. is the 2014 projected marketing year average from the Food and Agricultural Policy Research Institute at the University of Missouri. The corresponding average price for grain sorghum is \$3.33/bu. Average corn yield from the verification fields is 215.6 bu./acre and the grain sorghum yield is 118.1 bu./acre.

Average operating costs for corn in Table 9 are \$547.01 per acre. Table 10 indicates that fertilizers and nutrients are the largest expense category at \$177.95 per acre, or 33% of total operating costs. Seed costs average \$131.01, and irrigation energy costs average \$28.91 per acre.

With average yield of 215.6 bu./acre, average operating costs are \$2.57/bu. Operating costs range from a low of \$471.19 in Lonoke County to a high of \$631.77 in Clay County. Returns to operating costs average \$207.68 per acre. Returns to operating costs have a low of \$50.96 in White County and a high of \$328.18 in Arkansas County. Average fixed costs are \$76.64 which leads to average total costs of \$623.75 per acre. Returns to total costs average \$130.94 per acre with a low of -\$17.08 in White County and a high of \$267.59 in Arkansas County. Total specified costs average \$2.93/bu.

Table 9. Operating Costs, Total Costs¹, Costs per Bushel, and Returns for 2014 CGSRVP

County	Operating Costs	Operating Costs per Bushel	Returns to Operating Costs	Total Fixed Costs	Total Costs ¹	Returns to Total Costs	Total Costs per Bushel
Corn							
Arkansas	538.07	2.17	328.18	60.58	598.66	267.59	2.42
Clay	631.77	2.78	164.83	99.46	731.23	65.37	3.21
Jefferson	576.62	2.32	292.78	67.74	644.36	225.04	2.59
Lee	594.92	2.94	113.83	75.28	670.20	38.55	3.31
Lonoke	471.19	2.50	188.56	69.62	540.80	118.95	2.87
Mississippi	487.39	2.34	242.36	87.05	574.44	155.31	2.76
St. Francis	578.29	2.36	279.91	86.14	664.43	193.77	2.71
White	497.84	3.18	50.96	68.04	565.88	-17.08	3.61
Average	547.01	2.57	207.68	76.74	623.75	130.94	2.93
Grain Sorghum							
Chicot	333.42	2.49	112.80	51.08	384.50	61.72	2.87
Prairie	210.92	2.06	129.40	31.33	242.25	98.07	2.37
Average	272.17	2.28	121.10	41.20	313.38	79.90	2.62

¹Does not include land costs, management, or other expenses and fees not associated with production.

The grain sorghum fields have average operating costs of \$272.17 per acre which is \$2.28/bu. Fertilizers and nutrients are 42% of operating costs with an expense of \$115.07 per acre in Table 11. Returns to operating costs average \$121.10 per acre. Fixed costs average \$41.20, and this leads to average total costs of \$313.38, or \$2.62/bu. Returns to total specified costs average \$79.90 per acre.

Table 10. Corn RVP, 2014 Revenue and Expenses per Acre

Receipts	Field								Average
	Arkansas	Clay	Jefferson	Lee	Lonoke	Mississippi	St. Francis	White*	
Yield (bu)	247.5	227.6	248.4	202.5	188.5	208.5	245.2	156.8	215.6
Price (\$/bu)	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Total Crop Revenue	866.25	796.60	869.40	708.75	659.75	729.75	858.20	548.80	754.69
Operating Expenses									
Seed	129.88	162.35	129.88	126.06	87.38	141.34	141.34	129.88	131.01
Fertilizers & Nutrients	159.00	174.76	188.87	240.07	178.13	137.98	197.91	146.87	177.95
Herbicides	27.52	41.03	29.65	15.64	11.76	21.65	33.81	29.65	26.34
Insecticides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom Applications	19.00	12.00	12.00	31.00	25.00	19.00	19.00	19.00	19.50
Diesel Fuel	23.94	33.34	26.77	34.29	29.36	21.59	19.62	23.26	26.52
Repairs & Maintenance	20.91	32.79	23.86	25.25	23.55	24.39	22.83	24.23	24.73
Irrigation Energy Costs	29.95	52.42	37.44	12.65	15.81	17.06	22.75	37.44	28.19
Labor, Field Activities	10.43	11.63	9.44	9.66	8.52	7.53	7.02	8.22	9.06
Other Inputs & Fees	13.49	15.86	14.38	15.25	12.51	9.28	11.03	13.44	13.15
Post-harvest Expenses	103.95	95.59	104.33	85.05	79.17	87.57	102.98	65.86	90.56
Custom Harvest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Expenses	538.07	631.77	576.62	594.92	471.19	487.39	578.29	497.84	547.01
Returns to Operating Expenses	328.18	164.83	292.78	113.83	188.56	242.36	279.91	50.96	207.68
Land Rent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital Recovery & Fixed Costs	60.58	99.46	67.74	75.28	69.62	87.05	86.14	68.04	76.74
Total Specified Expenses¹	598.66	731.23	644.36	670.20	540.80	574.44	664.43	565.88	623.75
Returns to Specified Expenses	267.59	65.37	225.04	38.55	118.95	155.31	193.77	-17.08	130.94
Operating Expenses/bu	2.17	2.78	2.32	2.94	2.50	2.34	2.36	3.18	2.57
Total Expenses/bu	2.42	3.21	2.59	3.31	2.87	2.76	2.71	3.61	2.93

¹Does not include land costs, management, or other expenses and fees not associated with production.

* Significant greensnap greatly reduced yield

Table 11. Grain Sorghum RVP, 2014 Revenue and Expenses per Acre

Receipts	Field		
	Chicot	Prairie	Average
Yield (bu)	134.0	102	118.1
Price (\$/bu)	3.33	3.33	3.33
Total Crop Revenue	446.22	340.33	393.27
Operating Expenses			
Seed	28.56	21.42	24.99
Fertilizers & Nutrients	151.50	78.63	115.07
Herbicides	10.07	8.56	9.31
Insecticides	18.63	6.19	12.41
Other Chemicals	0.00	0.00	0.00
Custom Applications	28.00	37.25	32.63
Diesel Fuel	24.47	13.73	19.10
Repairs & Maintenance	18.26	12.59	15.43
Irrigation Energy Costs	3.74	0.00	1.87
Labor, Field Activities	8.94	4.70	6.82
Other Inputs & Fees	10.44	4.35	7.39
Post-harvest Expenses	30.82	23.51	27.16
Custom Harvest	0.00	0.00	0.00
Total Operating Expenses	333.42	210.92	272.17
Returns to Operating Expenses	112.80	129.40	121.10
Land Rent	0.00	0.00	0.00
Capital Recovery & Fixed Costs	51.08	31.33	41.20
Total Specified Expenses¹	384.50	242.25	313.38
Returns to Specified Expenses	61.72	98.07	79.90
Operating Expenses/bu	2.49	2.06	2.28
Total Expenses/bu	2.87	2.37	2.62

¹Does not include land costs, management, or other expenses and fees not associated with production.