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Corn and Grain Sorghum Research Verification Program

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University of Arkansas
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Arkansas ROW CROP VERIFICATION
DIVISION OF AGRICULTURE RESEARCH & EXTENSION University of Arkansas System

Arkansas Corn & Grain Sorghum Board

Table of Contents

CORN & GRAIN SORGHUM RESEARCH VERIFICATION PROGRAM, 2015

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INTRODUCTION

The 2015 growing season was the sixteenth 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.

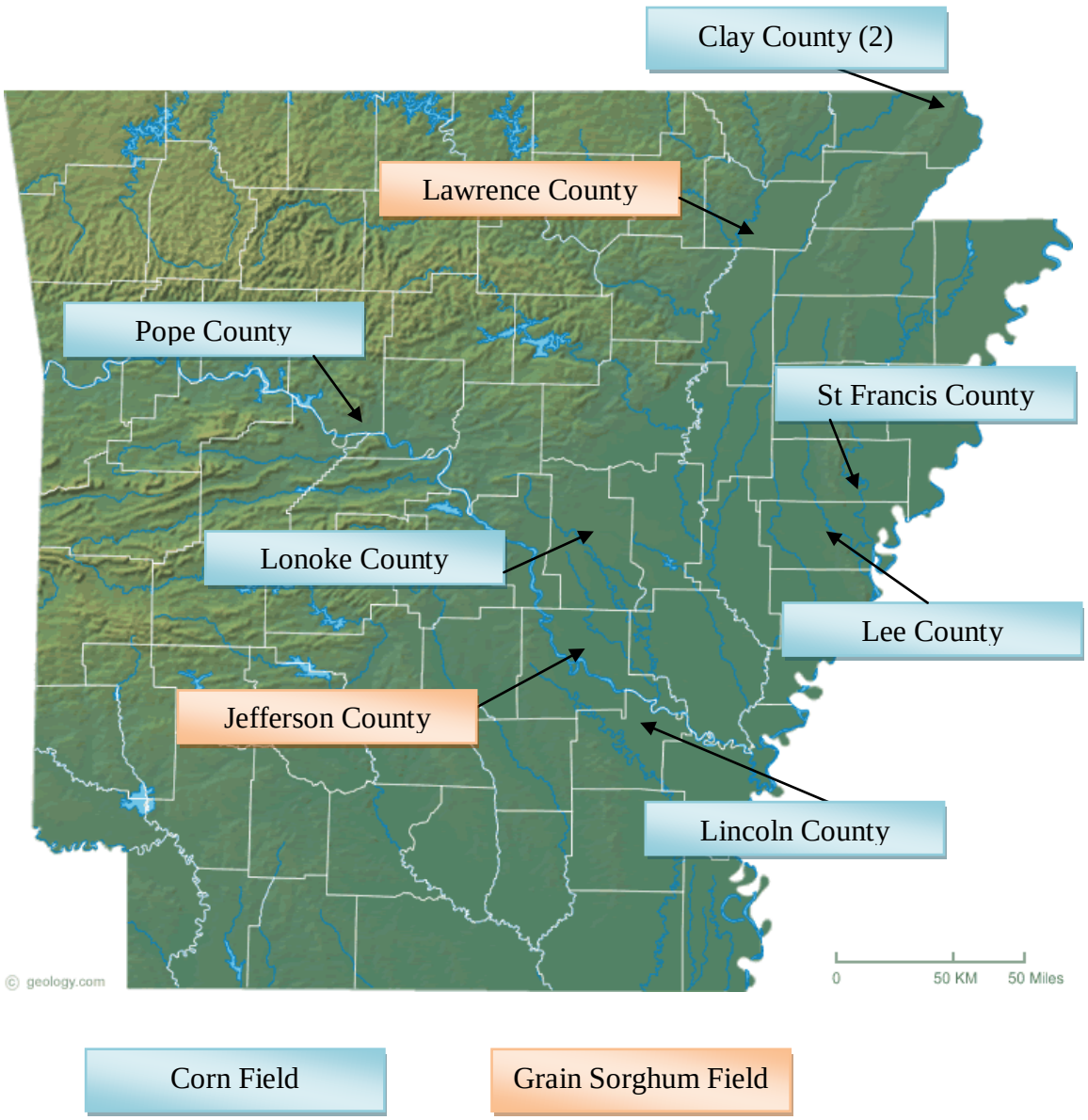
Each CGSRVP field and cooperator was selected prior to planting. Cooperators agreed to pay production expenses, provide crop expense data for economic analysis and implement the recommended production practices in a timely manner from seedbed preparation to harvest. Nine growers enrolled in the CGSRVP in the spring of 2015, seven corn and two grain sorghum fields. The fields were located on commercial farms and ranged in size from 22.8 to 67.4 acres for the corn fields with an average field size of 44.2 acres. The grain sorghum fields were 33.9 and 38.2 acres and averaged 36.1 acres.

The 2015 CGSRVP corn fields were in Clay, Lee, Lincoln, Lonoke, Pope and St Francis Counties; and the grain sorghum fields were in Jefferson and Lawrence Counties. Seven corn hybrids (Armor 1616PRO2, DeKalb DKC 62-06, DeKalb DKC 64-69 VT3P, DeKalb DKC 63-87 VT3P, Pioneer 1319, Pioneer P2089YHR and Terral REV 23BHR55) and two grain sorghum hybrids (Armor Maverick 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.

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/grain-sorghum www.arkansascrops.com

Figure 1. Location of 2015 Corn and Grain Sorghum Research Verification Fields



CORN FIELD REVIEWS

Clay County - Woolverton

The Clay County - Woolverton corn research verification field was located in the northeastern part of the county near Pollard. The field was 49.0 acres and the previous crop was soybeans. The soil type was Falaya Silt Loam. The field was turbo tilled and a mixed preplant fertilizer of 65-46-90-0-5 was custom applied on April 11. The field was turbo tilled again; field cultivated then hipped and planted on April 12 with Terral REV 23BHR55 at 34,000 seeds per acre on 30 inch row spacing. The field emerged on April 25. The field received approximately 3 inches of rain before emergence which led to a low final plant population of 28,500 plants per acre. Rain continued to fall on the field which delayed the nitrogen sidedress application. On May 15, 50 pounds of Urea (23 units of N) plus 50 pounds of ammonium sulfate (11 units of N, 12 units of S) was aerially applied to the field to supply nutrients to the plants until the liquid sidedress nitrogen could be applied. On May 23, 1 quart of glyphosate per acre was applied for grass control. 36 gallons of 32% (126 units of N) was applied by the producer on May 27. Total fertilizer for this field was 225-46-90-12-5. 3.6 pints of Halex GT was applied by the producer for weed control on June 4. The field received 14.03 inches of rain from planting to R6 (black layer) and was furrow irrigated 5 times. The field was harvested on September 8 at 16.1% moisture and yielded 205.7 bushels per acre adjusted to 15.5% moisture.

Clay County - Yount

The Clay County - Yount corn research verification field was located in the northeastern part of the county near Pollard. The field was 34.2 acres and the previous crop was soybeans. The soil type was Faylaya Silt Loam. The field was turbo tilled on April 25 and a mixed preplant fertilizer of 62-69-90-0-0 was custom applied on May 1 followed by bedding. The field was planted on May 1 with DeKalb DKC 63-87 at 34,500 seeds per acre on 30 inch row spacing. The field emerged on May 7 and the final plant population was 33,000 plants per acre. The field received rain which made ground application of sidedress nitrogen difficult, so on May 24, 100 pounds of Urea (46 units of N) was aerially applied. 120 pounds of Urea (55 units of N) plus 50 pounds of ammonium sulfate (11 units of N, 12 units of S) was custom applied on May 30. The producer then plowed the middles to allow for better irrigation efficiency, followed by 3.6 pints of Halex GT on May 31 for weed control. A pretassel application of 100 pounds of Urea (46 units of N) was applied on June 26. Total fertilizer for this field was 222-69-90-12-0. Southern Rust infected the field and 4 ounces of propiconazole was aerially applied on August 3. The field received 14.09 inches of rain from planting to R6 (black layer) and was furrow irrigated 5 times. The field was harvested on September 14 at 13.5% moisture and yielded 198.4 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 38.0 acres and the previous crop was soybeans. The soil type was Grenada Silt Loam. The field was field cultivated, ripped and then field cultivated again. A mixed preplant fertilizer of 65-90-90-0-10 was custom applied on April 4 and bedded in. The field was planted on April 4 with Armor 1616PRO2 at 33,000 seeds per acre on 38 inch row spacing followed by a custom application of 1.5 pints of metolachlor. The field emerged on April 13 and the final plant population was 33,000 plants per acre. As the plants developed, a zinc deficiency was observed. 235 pounds of Urea (108 units of N) plus 15 pounds of zinc sulfate (5 units of Zn) was custom applied on May 9. On May 15, 3.6 pints of Halex GT plus 1.5 quarts of atrazine was custom applied for weed control. 1 gallon of foliar zinc (1 unit of Zn) was aerially applied on May 29. A pretassel application of 100 pounds of Urea (46 units) was applied on June 6. Total fertilizer for this field was 219-90-90-0-16. The field received 17.67 inches of rain from planting to R6 (black layer) and was furrow irrigated 4 times. The field was harvested on August 24 at 19.0% moisture and yielded 181.2 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 south of Grady. The field was 67.4 acres and the previous crop was soybeans and cotton. The soil type was Herbert Silt Loam and Perry Clay. The field was disked, subsoiled and field cultivated. A mixed fertilizer of 0-70-100-0-5 was applied on April 1 by the producer then the field was hipped and rolled. The field was planted on April 1 with DeKalb DKC 64-69 at 32,000 seeds per acre on 38 inch row spacing. 27 gallons of 28-0-0-5-0 (81 units of N) was applied by the producer behind the planter. The field emerged on April 10 and the final plant population was 30,500 plants per acre. On May 4, 46 gallons of 32% (115 units of N) was applied by the producer followed by a middle sweep for irrigation. Total fertilizer for the field was 242-70-100-0-5. The field was sprayed on May 5 with 1.5 quarts of atrazine, 1.5 pts of metolachlor plus 1 quart of glyphosate for weed control. The field received 15.02 inches of rain from planting to R6 (black layer) and was furrow irrigated 7 times. The field was harvested on August 11 at 18.3% moisture and yielded 228.9 bushels per acre adjusted to 15.5% moisture.

Lonoke County

The Lonoke County corn research verification field was located in the southern part of the county near Keo. The field was 54.4 acres and the previous crop was soybeans. The soil type was Herbert Silt Loam. The field was disked, turbo tilled and floated. A mixed preplant fertilizer of 65-0-90-0-6 was custom applied on April 1 and bedded in. The field was planted on April 1 with Pioneer 1319 (conventional hybrid) at 34,000 seeds per acre on 30 inch row spacing followed by a custom application of 1.5 pints of metolachlor. The field emerged on April 10 and the final plant population was 34,000 plants per acre. On May 1, glyphosate drift was observed on the field at levels severe enough to warrant replanting. 1 quart of glyphosate was applied on May 3 to destroy the old stand and the field was replanted on May 4 with Pioneer 1319 at 34,000 seeds per acre. The field emerged on May 9 and the final plant population was 33,000 plants per acre. On May 24, 1.5 quarts of atrazine, 0.75 ounces of Armezon plus 2 ounces of Zidua were custom applied for weed control. 250 pounds of Urea (115 units of N) was custom applied on May 24. A pretassel application of 100 pounds of Urea (46 units) was applied on June 25. Total fertilizer for this field was 226-0-90-0-6. The field received 12.28 inches of rain from replanting to R6 (black layer) and was furrow irrigated 5 times. The field was harvested on August 31 at 21.0% moisture and yielded 145.0 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 22.8 acres and the previous crop was soybeans. The soil type was Rilla Silt Loam. The field was disked and subsoiled. A mixed preplant fertilizer of 67-0-90-24-0 was applied by the producer and bedded in on May 2. The field was planted on May 2 with DeKalb DKC 62-06 (conventional hybrid) at 34,000 seeds per acre on 30 inch row spacing. 1.25 pints of metolachlor was applied by the producer on May 5. The field emerged on May 8 and the final plant population was 33,500 plants per acre. 200 pounds of Urea (92 units of N) plus 100 pounds of ammonium sulfate (21 units of N, 24 units of S) was aerially applied on May 23. The producer applied 1.5 quarts of atrazine, 1.3 pints of metolachlor plus 0.75 ounces of Permit Plus on May 23 for weed control. A pretassel application of 100 pounds of Urea (46 units of N) was applied on June 22. The total fertilizer for the field was 226-0-90-48-0. The field received 14.86 inches of rain from planting to harvest and was furrow irrigated 3 times. Storms came through at the end of June causing approximately 35% greensnap damage. The producer decided to cut the field for silage at that point instead of grain. The field was harvested on August 5 and yielded 23 tons of silage per acre.

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 43.7 acres and the previous crop was soybeans. The soil type was Earle Clay. The field received a burndown application of 0.5 pints of Dicamba, 0.75 ounces of FirstShot, plus 28 ounces of Touchdown on March 10. A mixed preplant fertilizer of 90-90-60-0-0 was applied on April 2 and the field was planted no-till with Pioneer 2089YHR at 33,000 seeds per acre on 38 inch row spacing. An application of 1.25 pints of metolachlor was applied by the producer right after planting. The field emerged on April 12 and the final plant population was 32,000 plants per acre. 290 pounds of Urea (133 units of N) plus 100 pounds of ammonium sulfate (21 units of N, 24 units of S) was custom applied on May 5. On May 14, 3.6 pints of Halex GT plus 2 quarts of atrazine was applied by the producer for weed control. A pretassel application of 100 pounds of Urea (46 units) was applied on June 9. Total fertilizer for this field was 290-90-60-24-0. The field received 14.52 inches of rain from planting to R6 (black layer) and was pivot irrigated 6 times. The field was harvested on September 4 at 14.2% moisture and yielded 184.8 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 soybeans. The soil type was McGehee/Rilla Silt Loam. The field was disked then and a preplant fertilizer of 48-48-48-0-0 was appled on May 1. The field was bedded on 60 inch beds and planted on May 2 with Armor Maverick at 8 pounds (approximately 100,000 seeds/acre) per acre on 30 inch spacing. 1.3 pints of metolachlor was custom applied on May 6. The field emerged on May 9 and the final plant population was 89,500 plants per acre. On May 29, 240 pounds of Urea (110 units of N) plus 50 pounds of ammonium sulfate (11 units of N, 12 units of S) was custom applied. Total fertilizer for the field was 169-48-48-12-0. 1.3 quarts of atrazine was applied on May 29 for weed control. On June 3 glyphosate drift was noticed in the central part of the field. This stunted the plants severely but never completely killed the plants, and eventually they grew out of the injury. The field was sprayed with 14 ounces of Prevathon on July 29 for headworm control. 1 ounce of Transform for White Sugarcane Aphids and 1 quart of glyphosate for harvest aid was aerially applied on August 28. The field received 13.27 inches of rain from planting to maturity and was furrow irrigated 2 times. The field was harvested on September 17 at 13.9% moisture and yielded 113.3 bushels per acre adjusted to 14% moisture.

Lawrence County

The Lawrence County grain sorghum research verification field was located in the southern part of the county near Alicia. The field was 38.2 acres and previous crop was soybeans. The soil type was Bosket Fine Sandy Loam. The field was disked on April 20. A mixed preplant fertilizer of 0-48-69-5-10 was applied on February 23 by the producer and bedded in. A burndown of 2 ounces of Sharpen plus 1.5 quarts of glyphosate was aerially applied on April 18. The beds were cleaned up on April 25 and the field was planted on April 30 with Pioneer 84P80 at 8 pounds per acre (approximately 100,000 seeds/acre) on 38 inch twin row spacing. 1.3 pints of metolachlor was custom applied, and 100 lbs of Urea (46 units of N) was aerially applied on April 30 after planting. The field emerged on May 7. The field had some planting issues and the final plant population was only 64,000 plants per acre. On May 23, 110 pounds of 41-0-0-4 (45 units of N, 5 units of S) was applied by the producer. 1.2 quarts of atrazine was custom applied on May 29 for weed control. 195 pounds of 31-0-0-10 (61 units N, 20 units of S) was applied by the producer on May 30. Total fertilizer for the field was 152-48-69-30-10. The field received 18.49 inches of rain from planting to maturity and was furrow irrigated 2 times. The field was harvested on August 26 at 14.2% moisture and yielded 97.7 bushels per acre adjusted to 14% moisture.

Table 1. Agronomic information for the 2015 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 – Wool.	Terral 23BHR55[1]	49.0	30	Soybeans	34,000	28,500	April 12	April 25	September 8	205.7
Clay – Yount	DeKalb DKC 63-87[2]	34.2	30	Soybeans	34,500	33,000	May 1	May 7	September 14	198.4
Lee	Armor 1616 PRO2[3]	38.0	38	Soybeans	33,000	33,000	April 4	April 13	August 24	181.2
Lincoln	DeKalb DKC 64-69[2]	67.4	38	Soybeans	32,000	30,500	April 1	April 10	August 11	228.9
Lonoke	Pioneer 1319	54.4	30	Soybeans	34,000	33,000	May 4	May 9	August 31	145.0
Pope	DeKalb DKC 62-06	22.8	30	Soybeans	34,000	33,500	May 2	*May 8*	August 5	23 tons
St Francis	Pioneer 2089YHR[1]	43.7	38	Soybeans	33,000	32,000	April 2	April 12	September 4	184.8
Average		**44.2**			**33,500**	**32,000**	**April 16**	**April 24**	**August 30**	**190.7**

Traits – [1] YieldGard, Herculex I, Roundup Ready Corn 2, Liberty Link
[2]Genuity VT Triple Pro
[3]Genuity VT Double Pro

Table 2. Agronomic information for the 2015 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----------										
Jefferson	Armor Maverick	33.9	30	Soybeans	8	89,500	May 2	May 9	September 17	113.3
Lawrence	Pioneer 84P80	38.2	38 twin	Soybeans	8	64,000	April 30	May 8	August 26	97.7
Average		**36.1**			**8**	**76,500**	**May 1**	**May 8**	**September 6**	**105.5**

Table 3. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2015 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		
Clay – Wool.	6.5	70	244	20	8.0	65-46-90-0-5	160-0-0-12-0	0-0-0-0-0	225-46-90-12-5	Falaya Silt Loam
Clay – Yount	6.4	56	160	21	16.3	62-69-90-0-0	114-0-0-12-0	46-0-0-0-0	222-69-90-12-0	Falaya Silt Loam
Lee	7.8	35	195	22	2.0	65-90-90-0-10	108-0-0-0-6	46-0-0-0-0	219-90-90-0-16	Grenada Silt Loam
Lincoln	7.3	100	409	16	4.0	81-70-100-0-5	161-0-0-0-0	0-0-0-0-0	242-70-100-0-5	Herbert Silt Loam
Lonoke	6.5	76	220	14	5.0	65-0-90-0-6	115-0-0-0-0	46-0-0-0-0	226-0-90-0-6	Herbert Silt Loam
Pope	6.0	120	180	26	5.4	67-0-90-24-0	113-0-0-24-0	46-0-0-0-0	226-0-90-48-0	Rilla Silt Loam
St Francis	6.2	55	500	12	4.7	90-90-60-0-0	154-0-0-24-0	46-0-0-0-0	290-90-60-24-0	Earle Clay

Table 4. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2015 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		
Jefferson	7.5	67	183	21	6.2	48-48-48-0-0	121-0-0-12-0	169-48-48-12-0	Rilla Silt Loam
Lawrence	6.7	72	228	16	4.4	46-48-69-5-10	106-0-0-25-0	152-48-69-30-10	Bosket Fine Sandy Loam

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

Table 5. Pesticide information for the 2015 Corn Research Verification fields.

County	Herbicide	Insecticide	Fungicide
Clay – Wool.	1 qt glyphosate – May 23 3.6 pts Halex GT – June 4	None	None
Clay – Yount	3.6 pts Halex GT – May 31	None	4 oz Propiconazole – Aug 3
Lee	1.5 pts metolachlor – April 4 3.6 pts Halex GT + 1.5 qts atrazine – May 15	None	None
Lincoln	1.5 qts atrazine + 1.5 pts metolachlor + 1 qt glyphosate – May 5	None	None
Lonoke	3 pts Cornerstone – March 25 1.5 pts metolachlor – April 4 1 qt glyphosate – May 3 1.5 qt atrazine + 0.75 oz Armezon + 2 oz Zidua – May 24	None	None
Pope	1.25 pts metolachlor – May 5 1.5 qts atrazine + 1.3 pts metolachlor + 0.75 oz Permit Plus – May 23	None	None
St Francis	0.5 pt Dicamba + 0.75 oz First Shot – March 10 1.25 pts Dual – April 2 3.6 pts Halex GT + 2 qts atrazine – May 14	None	None

Table 6. . Pesticide information for the 2015 Grain Sorghum Research Verification field.

County	Herbicide	Insecticide	Fungicide
Jefferson	1.3 pts metolachlor – May 6 1.3 qts atrazine – May 29 1 qt glyphosate – August 28	14 oz Prevathon – July 29 1 oz Transform – August 28	None
Lawrence	2 oz Sharpen + 1.5 qt glyphosate – April 18 1.3 pts metolachlor – April 30 1.2 qts atrazine – May 29	None	None

Table 7. Irrigation information and rainfall for the 2015 Corn Research Verification Fields.

County	Irrigation Type	Number of Irrigations	Rainfall (in) Planting to Black Layer (R6)	Rainfall (in) Planting to Harvest
Clay – Wool.	Furrow	5	14.03	16.02
Clay – Yount	Furrow	5	14.09	14.87
Lee	Furrow	4	17.67	20.64
Lincoln	Furrow	7	15.02	15.64
Lonoke	Furrow	5	12.28	13.41
Pope	Furrow	3	---*	14.86
St Francis	Pivot	6	14.52	18.16

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

Table 8. Irrigation information and rainfall for the 2015 Grain Sorghum Research Verification Fields.

County	Irrigation Type	Number of Irrigations	Rainfall (in) Planting to Maturity	Rainfall (in) Planting to Harvest
Jefferson	Furrow	2	13.27	14.27
Lawrence	Furrow	2	18.49	20.11

*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 2015 Corn Research Verification Fields

Growth Stage	Accumulated Growing Degree Days (GDD50)							
	Clay-Wool.	Clay-Yount	Lee	Lincoln	Lonoke	Pope	St Francis	Avg.
VE	171	147	150	159	151	154	165	157
V2	266	254	295	279	304	279	273	279
V4	456	399	469	377	442	431	494	438
V6	626	558	673	599	617	548	621	606
V8	834	816	833	760	811	713	854	803
V10	1032	959	990	938	1018	854	972	966
V12	1145	1102	1142	1035	1164	996	1129	1102
V14	1233	1222	1224	1134	1286	1140	1239	1211
V16	1373	1313	1342	1223	1375	1229	1379	1319
R1	1550	1504	1585	1409	1518	1408	1586	1509
R2	1683	1671	1739	1640	1703	1590	1796	1689
R3	1836	1825	1884	1849	1870	1791	1932	1855
R4	2023	1976	2028	1984	1996	1975	2044	2004
R5	2203	2125	2142	2177	2150	2218	2188	2172
R6	2720	2864	2800	2792	2760	*	2937	2812

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

Economic Analysis – Dr. Archie Flanders

This section provides information on production costs for the 2015 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.

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 2015 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.

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 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 $3.80/bu. is the 2015 projected U.S. marketing year average price of the World Agricultural Supply and Demand Estimate from the U.S.D.A. The corresponding average price for grain sorghum is $4.20/bu. as determined by field reports that establish a premium over corn price for 2015 production in Arkansas. Average corn yield from the verification fields harvested for grain is 190.7 bu./acre and the grain sorghum yield is 105.5 bu./acre. The corn field harvested for silage has a yield of 23.0 tons/acre.

Average operating costs for the corn fields harvested for grain in Table 10 are $561.81 per acre. Table 11 indicates that fertilizers and nutrients are the largest expense category at $182.92 per acre, or 33% of total operating costs. Seed costs average $123.29 which is 22% of total operating costs.

With average grain yield of 190.7 bu./acre, average operating costs are $3.00/bu. Operating costs range from a low of $526.18 in Lonoke County to a high of $606.41 in Lee County. Returns to operating costs average $162.73 per acre. Returns to operating costs have a low of $24.82 in Lonoke County and a high of $282.77 in Lincoln County. Average fixed costs are $91.81 which leads to average total costs of $653.61 per acre. Returns to total costs average $70.92 per acre with a low of -$72.52 in Lonoke County and a high of $174.68 in Lincoln County. Total specified costs average $3.49/bu.

Table 10. Operating Costs, Total Costs[1], Costs per Bushel, and Returns for 2015 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				
Clay-Woolverton	539.03	2.62	242.63	88.91	627.95	153.71	3.05
Clay-Yount	540.87	2.73	213.05	81.44	622.31	131.61	3.14
Lee	606.41	3.35	82.15	88.68	695.09	-6.53	3.84
Lincoln	587.05	2.56	282.77	108.09	695.14	174.68	3.04
Lonoke	526.18	3.63	24.82	97.34	623.52	-72.52	4.30
St Francis	571.29	3.09	130.95	86.38	657.67	44.57	3.56
Average, Grain	**561.81**	**3.00**	**162.73**	**91.81**	**653.61**	**70.92**	**3.49**
Pope, Silage	400.84	17.43	381.16	112.59	513.44	268.56	22.32
			Grain Sorghum				
Lawrence	362.88	3.71	47.46	68.54	431.42	-21.08	4.42
Jefferson	320.32	2.83	155.54	63.98	384.31	91.55	3.39
Average	**341.60**	**3.27**	**101.50**	**66.26**	**407.87**	**35.23**	**3.90**

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

The grain sorghum fields have average operating costs of $341.60 per acre which is $3.27/bu. Fertilizers and nutrients are 42% of operating costs with an expense of $143.82 per acre in Table 12. Returns to operating costs average $101.50 per acre. Fixed costs average $66.26, and this leads to average total costs of $407.87, or $3.90/bu. Returns to total specified costs average $35.23 per acre.

Table 11. Corn RVP, 2015 Revenue and Expenses per Acre

	Field							
Revenue	Clay-Woolverton	Clay-Yount	Lee	Lincoln	Lonoke	St. Francis	**Average, Grain**	Pope, Silage
Yield (bu., ton)	205.7	198.4	181.2	228.9	145.0	184.8	190.7	23.0
Price ($/bu., ton)	3.80	3.80	3.80	3.80	3.80	3.80	3.80	34.00
Total Crop Revenue	**781.66**	**753.92**	**688.56**	**869.82**	**551.00**	**702.24**	**724.53**	**782.00**
Operating Expenses								
Seed	129.54	131.45	125.73	121.92	105.40	125.73	123.29	85.00
Fertilizers & Nutrients	175.26	158.56	220.14	204.06	140.08	199.43	182.92	145.30
Herbicides	26.46	21.46	45.87	29.41	58.45	62.84	40.75	36.88
Insecticides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Chemicals	0.00	3.36	0.00	0.00	0.00	0.00	0.56	0.00
Custom Applications	13.00	39.00	38.00	0.00	43.00	19.00	25.33	28.00
Other Inputs	3.45	3.45	3.45	3.45	3.45	0.00	2.88	3.45
Diesel Fuel	20.89	19.67	26.69	29.10	27.77	12.07	22.70	32.03
Irrigation Energy Costs	29.29	29.29	15.46	41.01	29.29	26.70	28.51	11.59
Input Costs	**397.88**	**406.24**	**475.33**	**428.95**	**407.43**	**445.76**	**426.93**	**342.26**
Repairs & Maintenance[1]	27.06	24.65	25.29	29.24	29.75	24.58	26.76	34.14
Labor, Field Activities	11.17	10.23	12.08	14.63	13.06	6.48	11.27	15.15
Production Expenses	**436.11**	**441.12**	**512.69**	**472.82**	**450.24**	**476.81**	**464.97**	**391.54**
Interest	10.36	10.48	12.18	11.23	10.69	11.32	11.04	9.30
Post-harvest Expenses	92.57	89.28	81.54	103.01	65.25	83.16	85.80	0.00
Total Operating Expenses	**539.03**	**540.87**	**606.41**	**587.05**	**526.18**	**571.29**	**561.81**	**400.84**
Returns to Operating Expenses	**242.63**	**213.05**	**82.15**	**282.77**	**24.82**	**130.95**	**162.73**	**381.16**
Capital Recovery & Fixed Costs	88.91	81.44	88.68	108.09	97.34	86.38	91.81	112.59
Total Specified Expenses[2]	**627.95**	**622.31**	**695.09**	**695.14**	**623.52**	**657.67**	**653.61**	**513.44**
Returns to Specified Expenses	**153.71**	**131.61**	**-6.53**	**174.68**	**-72.52**	**44.57**	**70.92**	**268.56**
Operating Expenses/bu., ton	2.62	2.73	3.35	2.56	3.63	3.09	3.00	17.43
Total Specified Expenses/bu., ton	3.05	3.14	3.84	3.04	4.30	3.56	3.49	22.32

[1]Includes employee labor allocated to repairs and maintenance.
[2]Does not include land costs, management, or other expenses and fees not associated with production.

Table 12. Grain Sorghum RVP, 2015 Revenue and Expenses per Acre

	Field		
Revenue	Lawrence	Jefferson	**Average**
Yield (bu.)	97.7	113.3	105.5
Price ($/bu.)	4.20	4.20	4.20
Total Crop Revenue	**410.34**	**475.86**	**443.10**
Operating Expenses			
Seed	29.76	29.76	29.76
Fertilizers & Nutrients	170.24	117.40	143.82
Herbicides	39.58	26.16	32.87
Insecticides	0.00	13.13	6.56
Other Chemicals	0.00	0.00	0.00
Custom Applications	26.00	38.00	32.00
Other Inputs	3.45	3.45	3.45
Diesel Fuel	17.65	17.12	17.38
Irrigation Energy Costs	11.72	11.72	11.72
Input Costs	**298.39**	**256.73**	**277.56**
Repairs & Maintenance[1]	20.24	17.44	18.84
Labor, Field Activities	11.03	9.95	10.49
Production Expenses	**329.65**	**284.12**	**306.89**
Interest	7.83	6.75	7.29
Post-harvest Expenses	25.40	29.46	27.43
Total Operating Expenses	**362.88**	**320.32**	**341.60**
Returns to Operating Expenses	**47.46**	**155.54**	**101.50**
Capital Recovery & Fixed Costs	68.54	63.98	66.26
Total Specified Expenses[2]	**431.42**	**384.31**	**407.87**
Returns to Specified Expenses	**-21.08**	**91.55**	**35.23**
Operating Expenses/bu	3.71	2.83	3.27
Total Expenses/bu	4.42	3.39	3.90

[1]Includes employee labor allocated to repairs and maintenance.
[2]Does not include land costs, management, or other expenses and fees not associated with production.