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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
And County Governments Cooperating

Arkansas ROW CROP VERIFICATION
UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

ARKANSAS CORN & GRAIN SORGHUM BOARD

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CORN & GRAIN SORGHUM RESEARCH VERIFICATION PROGRAM, 2010

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INTRODUCTION

The 2010 growing season was the eleventh 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.

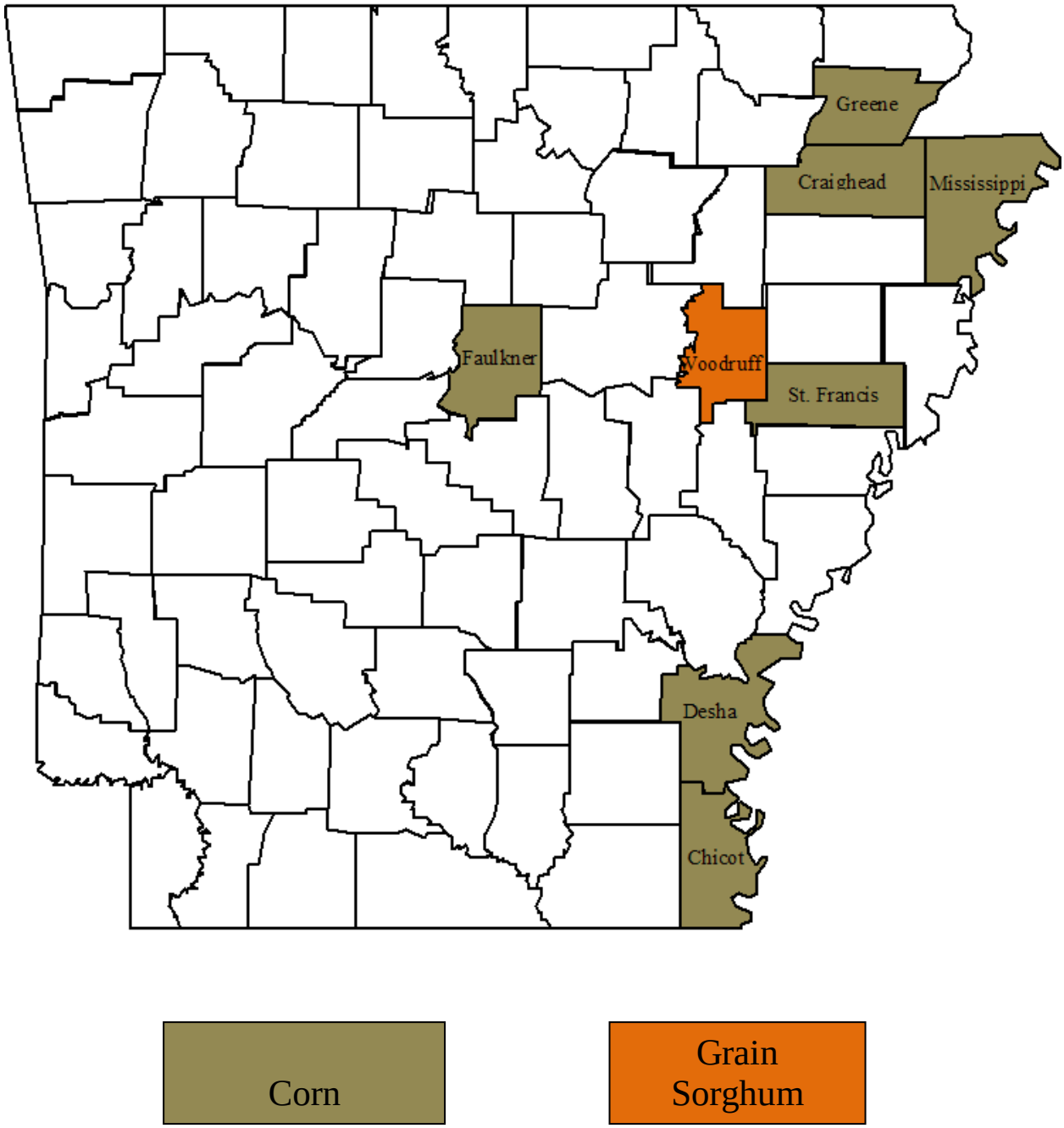
5. To promote timely implementation of cultural and management practices among corn and grain sorghum growers.

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 were enrolled in the CGSRVP in the spring of 2010, seven corn and one grain sorghum field. The fields were located on commercial farms ranging in size from 27.3 to 75 acres for corn fields, and 68 acres for the grain sorghum field. The average field size was 38.4 acres for the corn fields.

The 2010 CGSRVP corn fields were conducted in Chicot, Craighead, Desha, Faulkner, Greene, Mississippi, and St. Francis Counties; and one grain sorghum field in Woodruff County. Five different corn hybrids (DeKalb DKC 64-83VT3P, Pioneer 32D79, Pioneer 33D49, Pioneer 2023HR, and Terral REV 28HR20) and one grain sorghum variety (Pioneer 84G62) 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 2010 Corn and Grain Sorghum Research Verification Fields



CORN FIELD REVIEWS

Chicot County

The Chicot County corn research verification field was located in the south part of the county just south of Eudora. The field was 37 acres and the previous crop was soybeans. The soil type was Sharkey clay. The field was tilled and hipped in the fall. A preplant fertilizer of 18-47-45-0-0 was applied on March 10 and cultivated in. The field was planted on March 18 with Pioneer 2023HR at 35,000 seeds per acre with 38 inch row spacing. Corn emergence date was March 30. The final plant stand was 34,800 plants per acre. 32% UAN was applied April 1 at 50 gallons per acre (175 units). Another 20 gallons of UAN 32% (70 units) was applied on April 8 due to a problem with the knifing equipment. Total fertilizer for this field was 263-47-45-0-0. On April 10, 2 quarts of Atrazine plus 1 quart of Glyphosate was applied by the producer for weed control. Furrow irrigation started on May 7 and the field was irrigated 4 times. Southern rust came in late, but was not treated because of the maturity of the crop. The field was harvested on August 10 at 15.5% moisture and yielded 202.11 bushels per acre.

Craighead County

The Craighead County corn research verification field was located in the eastern part of the county just southwest of Lake City. The field was 35.5 acres and the previous crop was soybeans. The soil type was Dundee Fine Sandy Loam. The field was disked and land-planed in the fall. On April 1, mixed fertilizer of 90-0-60-24-0 was custom applied and the field hipped and rolled. The field was planted on April 2 with Pioneer 32D79 at 35,000 seeds per acre with 38 inch twin row spacing using a Monosem twin row planter. Corn emergence date was April 10. The final plant stand was 34,000 plants per acre. On April 16 the producer applied 2 quarts of Atrazine plus 22 ounces of Roundup Powermax for weed control. 40 gallons of UAN 32% (140 units) was applied on April 28 at the V4 growth stage. At the V5 growth stage, the field suffered a wind storm that sand blasted the plants. The field recovered but looked ragged for a week. Furrow irrigation started on May 22, and the field was irrigated 11 times. A pre tassel application of 100 pounds of Urea (46 units) was aerially applied on May 27. The total fertilizer for this field was 276-0-60-24. The field received a hail storm on June 3. The upper leaves of the plants were split, but did not die or fall off the plant. The field was harvested on August 13 at 14.5% moisture and yielded 193.82 bushels per acre when adjusted to 15.5% moisture.

Desha County

The Desha County corn research verification field was located in the southern part of the county near McGehee. The field was 75 acres and the previous crop was soybeans. The soil type was Herbert Silt Loam. A burndown application of Glyphosate, 2,4-D and Harmony Extra was applied on February 1. A mixed fertilizer of 0-60-90 was applied by the producer and the field was bedded. The field was planted on March 31 with DeKalb 64-83 VT3P at 33,000 seeds per acre with 38 inch row spacing. Corn emergence date was April 10. The final plant stand was 33,000 plants per acre. 43 gallons of UAN 32% (150 units), 74 pounds of Urea (34 units) and 75 pounds of Ammonium Sulfate (16 units of N and 18 units of S) were applied on April 20 at the V3 growth stage. On April 21 the producer applied 1 quart of Atrazine, 2 quarts of Glyphosate plus 1 quart of Dual for weed control. A quart of foliar Zinc was also included in this application. Furrow irrigation started on May 13, and the field was irrigated 12 times. A pre tassel application of 100 pounds of Urea (46 units) was aerially applied on May 25. The total fertilizer for this field was 246-60-90-18-1. The field was harvested on August 10 at 18.5% moisture and yielded 219.83 bushels per acre when adjusted to 15.5% moisture.

Faulkner County

The Faulkner County corn research verification field was located in the western part of the county near the Toad Suck area (Adjacent to the Arkansas River). The field was 31.1 acres and the previous crop was soybeans. The soil type was Gallion Silt Loam. The field was fertilized with 300 pounds per acre of 19-19-19, 100 pounds of Ammonium Sulfate and 30 lbs of Zinc Sulfate (78-57-57-24-10) on April 13, and then the field was disked and cultivated. The field was planted on April 16 with Terral REV 28HR20 at 32,000 seeds per acre with 30 inch row spacing. Corn emergence date was April 23. The final plant stand was 31,400 plants per acre. On May 7 the producer applied 2 quarts of Atrazine plus 1 quart of Glyphosate for weed control. 325 pounds of Urea (150 units) was applied by the producer on May 19 at the V5 growth stage. The field was scouted the next week, and part of the field was wet when the Urea was applied and the corn was yellow. Another 100 pounds of Urea (46 units) was applied on 10 acres to compensate for nitrogen that had been lost. The total fertilizer for the field was 228-57-57-24-10. Pivot irrigation was started on June 1 and the field was irrigated 6 times. The field was harvested on September 13 at 14.7% moisture and yielded 194.04 bushels per acre when adjusted to 15.5% moisture.

Greene County

The Greene County corn research verification field was located in the southern part of the county just south of Paragould. The field was 27.3 acres and the previous crop was soybeans. The soil type was Calloway Silt Loam. On April 11th the field was disked, a mixed fertilizer of 80-80-100-24-8 was applied, and then the field was cultivated and hipped. The field was planted on April 13 with Pioneer 33D49 at 34,500 seeds per acre with 30 inch row spacing. Corn emergence date was April 22. The final plant stand was 33,900 plants per acre. On May 6 the producer applied 2 quarts of Halex GT plus 1 quart of Atrazine for weed control. 270 pounds of Urea (124 units) was applied on May 19 at the V6 growth stage. Furrow irrigation started on May 27 and the field was irrigated 8 times. A pre tassel application of 100 pounds of Urea (46 units) was aerially applied on June 3. Total fertilizer for the field was 250-80-100-24-8. The field was harvested on August 31 at 14.8% moisture and yielded 206.29 bushels per acre adjusted to 15.5% moisture.

Mississippi County

The Mississippi County corn research verification field was located in the western part of the county just south of Manila. The field was 31.2 acres and the previous crop was soybeans. The soil type was Routon-Dundee Complex. A mixed fertilizer of 79-0-60-24-0 was custom applied on April 13, and then the field was hipped. The field was planted on April 14 with Pioneer 33D49 at 32,500 seeds per acre with 38 inch row spacing. Corn emergence date was April 23. The final plant population was 30,400 plants per acre. On May 8 the producer applied 2 quarts of Atrazine, 1 quart of Glyphosate plus 1 ounce of Resolve Q for weed control. Urea was custom applied at 275 pounds per acre (127 units) on May 14 at the V5 growth stage. Pivot irrigation was started on May 23 and the field was irrigated 11 times. A pre tassel application of 100 pounds of Urea per acre (46 units) was applied on June 5. The total fertilizer for the field was 252-0-60-24-0. The field was harvested on August 23 at 17.7% moisture and yielded 193.98 bushels per acre when adjusted to 15.5% moisture.

St Francis County

The St Francis County corn research verification field was located in the northwestern part of the county near Wheatley. The field was 32 acres and the previous crop was soybeans. The soil type was Loring Silt Loam. The field was cultivated and floated then a mixed fertilizer of 82-90-90-0-10 was custom applied on March 30 followed by bedding. The field was planted on March 30 with DeKalb 64-83 VT3P at 33,800 seeds per acre with 30 inch row spacing. Corn emergence date was April 6. The final plant population was 33,600 plants per acre. On April 17, 1 quart of Atrazine plus 1 quart of Glyphosate was custom applied. Urea was custom applied at 275 pounds per acre (127 units) on April 29 at the V4 growth stage. Another 1 quart of Atrazine plus 1 quart of Glyphosate was custom applied on May 10. Furrow irrigation was started on May 25 and the field was irrigated 7 times. A pre tassel application of 100 pounds per acre of Urea (46 units) was aerially applied on May 31. The total fertilizer for the field was 255-90-90-0-10. The field was harvested on August 6 at 18% moisture and yielded 216.98 bushels per acre when adjusted to 15.5% moisture.

GRAIN SORGHUM FIELD REVIEW

Woodruff County

The Woodruff County grain sorghum research verification field was located in the southern part of the county near Cotton Plant. The field was 68.8 acres and the previous crop was soybeans. The soil type was Bosket Fine Sandy Loam. An application of Glyphosate and Dicamba was used as a burndown on March 15, then a bedder and conditioner was used on March 31. The field was planted on March 31 with Pioneer 84G62 at 6 lbs per acre with 38 inch row spacing. Grain sorghum emergence date was April 7th. The final plant population was 68,400 plants per acre. Starwarp was applied at 1.3 pints per acre on March 31 by the producer for weed control. On April 21, Urea and Triple Super Phosphate were applied with a variable rate applicator. The average fertilizer applied at this time was 75 pounds of Urea per acre(34.5 units) and 92 pounds of Triple Super Phosphate (42 units). Another application of Urea and potassium was variably applied on April 29 at the V5 growth stage. The average fertilizer applied at this time was 125 pounds of Urea (57.5 units) and 144 pounds of potassium (86 units). Total fertilizer for the field was 92-42-86. On May 13, the producer applied 1.5 qts of Atrazine for weed control. Furrow irrigation was started on May 25 and the field was irrigated 5 times. An application of 14 ounces of Quilt Excel was applied by the producer on June 10 for anthracnose and other diseases in the field. The field was harvested on August 16 at 14% moisture and yielded 116.58 bushels per acre.

Table 1. Agronomic information for the 2010 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)
Chicot	Pioneer 2023HR[1]	37.0	38	Soybeans	35,000	34,800	March 18	March 30	August 10	202.1
Craighead	Pioneer 32D79[1]	35.5	38 twin	Soybeans	35,000	34,000	April 2	April 10	August 13	193.8
Desha	DeKalb 64-83 VT3P[2]	75.0	38	Soybeans	33,000	33,000	March 31	April 10	August 10	219.8
Faulkner	Terral REV 28HR20[1]	31.1	30	Soybeans	32,000	31,400	April 16	April 23	Sept. 13	194.0
Greene	Pioneer 33D49[1]	27.3	30	Soybeans	34,500	33,900	April 13	April 22	August 31	206.3
Mississippi	Pioneer 33D49[1]	31.2	38	Soybeans	32,500	30,400	April 14	April 23	August 23	193.9
St Francis	DeKalb 64-83 VT3P[2]	32.0	30	Soybeans	33,800	33,600	March 30	April 6	August 6	216.9
Average	---	**38.4**	**---**	**---**	**33,686**	**33,014**	**April 4**	**April 13**	**August 19**	**203.8**

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

Table 2. Agronomic information for the 2010 Grain Sorghum Research Verification Field.

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)
Woodruff	Pioneer 84G62	68.8	38	Soybeans	6	68,400	March 31	April 7	August 16	116.6

Table 3. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2010 Corn Research Verification Fields.

	Soil Test (lb/ac)					Applied Fertilizer N-P-K-S-Zn[1] (lb/ac)			Total Applied Fertilizer	
County	pH	P	K	S	Zn	Preplant	Sidedress	Pre Tassel	N-P-K-S-Zn	Soil Classification
Chicot	6.4	106	552	32	9.2	18-47-45-0-0	245-0-0-0-0	0-0-0-0-0	263-47-45-0-0	Sharkey Clay
Craighead	7.1	198	244	16	6.2	90-0-60-24-0	140-0-0-0-0	46-0-0-0-0	276-0-60-24-0	Dundee Fine Sandy Loam
Desha	7.0	92	212	18	6.8	0-60-90-0-0	200-0-0-18-1	46-0-0-0-0	246-60-90-18-1	Herbert Silt Loam
Faulkner	5.5	64	266	34	7.6	78-57-57-24-10	150-0-0-0-0	0-0-0-0-0	228-57-57-24-10	Gallion Silt Loam
Greene	6.8	34	106	10	7.4	80-80-100-24-8	124-0-0-0-0	46-0-0-0-0	250-80-100-24-8	Calloway Silt Loam
Mississippi	6.3	106	300	18	6.6	79-0-60-24-0	127-0-0-0-0	46-0-0-0-0	252-0-60-24-0	Routon-Dundee Complex
St Francis	7.8	24	140	36	7.2	82-90-90-0-10	127-0-0-0-0	46-0-0-0-0	255-90-90-0-10	Loring Silt Loam

Table 4. Soil test results, applied fertilizer, total fertilizer and soil classification for the 2010 Grain Sorghum Research Verification Field.

	Soil Test (lb/ac)					Applied Fertilizer N-P-K-S-Zn[1] (lb/ac)		Total Applied Fertilizer	
County	pH	P	K	S	Zn	Preplant	Sidedress	N-P-K-S-Zn	Soil Classification
Woodruff	6.0	84	196	---	---	34.5-42-0-0-0	57.5-0-86-0-0	92-42-86-0-0	Bosket Fine Sandy Loam

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

Table 5. Pesticide information for the 2010 Corn Research Verification fields.

County	Herbicide	Insecticide	Fungicide
Chicot	2 qts atrazine + 3 pts glyphosate April 10	None	None
Craighead	2 qts atrazine + 22 oz Roundup Powermax April 10	None	None
Desha	1 qt atrazine + 2 qts glyphosate + 1 qt Dual April 21	None	6 oz Quadris June 24
Faulkner	2 qts atrazine + 1 qt glyphosate May 7	None	None
Greene	2 qts Halex + 1 qt atrazine May 9	None	None
Mississippi	2 qts atrazine + 1 qt glyphosate +1 oz Resolve Q May 8	None	None
St Francis	1 qt atrazine + 1 qt glyphosate – April 17 1 qt atrazine + 1 qt glyphosate – May 10	None	None

Table 6. . Pesticide information for the 2010 Grain Sorghum Research Verification field.

County	Herbicide	Insecticide	Fungicide
Woodruff	1.3 pts Starwarp – March 31 1.2 qts atrazine – May 10	None	14 oz Quilt Excel June 10

Table 7. Irrigation information and rainfall for the 2010 Corn Research Verification Fields.

County	Irrigation Type	Number of Irrigations	Rainfall (in)*
Chicot	Furrow	4 times	11.5
Craighead	Furrow	11 times	15.8
Desha	Furrow	12 times	13.5
Faulkner	Pivot	6 times	15.2
Greene	Furrow	8 times	9.2
Mississippi	Pivot	11 times	6.5
St Francis	Furrow	7 times	16.2

Table 8. Irrigation information and rainfall for the 2010 Grain Sorghum Research Verification Field.

County	Irrigation Type	Number of Irrigations	Rainfall (in)*
Woodruff	Furrow	5 times	11.0

*****Rainfall amount measured in verification field by weather stations and represents rainfall from planting until harvest

ECONOMIC ANALYSIS

This section provides information on production costs for the 2010 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 8 fields (7 corn and 1 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 2010 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 Tables 9 and 10. Costs in this report do not include land costs, management, or other expenses and fees not associated with production. Price received for corn of $4.18/bu. is the Arkansas monthly average for August and September. The corresponding average price for grain sorghum is $4.62/bu. Budget summaries for corn are presented in Table 11 and a summary for the single grain sorghum field is in Table 12. Average corn yield was 204 bu/acre and grain sorghum was 117 bu/acre.

Average operating costs in Table 9 are $503.40 per acre. Table 11 indicates that fertilizer is the largest expense category at $188.20/acre, or 37% of total operating costs. Seed costs average $102.87, and irrigation energy costs average $42.49 per acre.

With average yield of 204 bu./acre, average operating costs are $2.47/bu. Operating costs range from a low of $439.69 in Chicot County to a high of $571.97 in Desha County. Returns to operating costs average $348.73 per acre with a low of $301.33 in Greene County and a high of $404.67 in Chicot County. Average fixed costs are $71.13 which leads to average total costs of $574.53 per acre. Returns to total costs average $277.59 per acre with a low of $229.11 in Faulkner County and a high of $331.24 in Chicot County. Total specified costs average $2.82/bu.

The grain sorghum field in Woodruff County has operating costs of $257.60 per acre which is $2.20/bu. Fertilizer accounted for 38% of operating costs with an average expense of $98.87 per acre in Table 12. Returns to operating costs are $282.94 per acre. Fixed costs are $52.34, and this leads to total costs of $309.95, or $2.65/bu. Returns to total specified costs are $230.59 per acre.

Table 9. Operating Costs, Total Costs[1], Costs per Bushel, and Returns for the 2010 Corn Research Verification Fields.

County	Operating Costs	Operating Costs per Bushel	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs per Bushel
Chicot	439.69	2.18	404.67	73.43	513.12	331.24	2.54
Craighead	495.18	2.55	315.74	66.28	561.46	249.46	2.89
Desha	571.97	2.60	347.63	61.56	633.53	286.07	2.88
Faulkner	474.67	2.45	336.25	97.15	571.81	239.11	2.95
Greene	559.75	2.72	301.33	57.94	617.69	243.39	3.00
Mississippi	446.62	2.30	364.30	86.13	532.75	278.17	2.75
St Francis	535.89	2.47	371.17	55.45	591.34	315.72	2.73
Average	**503.40**	**2.47**	**348.73**	**71.13**	**574.53**	**277.59**	**2.82**

Table 10. Operating Costs, Total Costs[1], Costs per Bushel, and Returns for the 2010 Grain Sorghum Research Verification Field.

County	Operating Costs	Operating Costs per Bushel	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs per Bushel
Woodruff	257.60	2.20	282.94	52.34	309.95	230.59	2.65

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

Table 11. Summary of Revenue and Expenses per Acre for the 2010 Corn Research Verification Fields.

	County							
Receipts	Chicot	Craighead	Desha	Faulkner	Greene	Mississippi	St. Francis	**Average**
Yield (bu.)	202	194	220	194	206	194	217	204
Price Received	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18
Total Crop Revenue	**844.36**	**810.92**	**919.60**	**810.92**	**861.08**	**810.92**	**907.06**	**852.12**
Operating Expenses								
Seed	101.64	107.80	101.64	98.56	106.26	100.10	104.10	102.87
Fertilizers & Nutrients	154.20	155.64	186.58	216.23	228.07	144.26	232.43	188.20
Chemicals	11.60	13.36	51.84	10.92	22.10	17.77	13.64	20.18
Custom Applications	0.00	12.00	13.00	0.00	18.50	17.50	28.50	12.79
Fuel & Lube	23.75	19.88	16.39	15.27	15.26	10.89	14.82	16.61
Repairs & Maintenance	15.34	16.94	15.53	13.30	14.02	12.23	11.29	14.09
Irrigation Energy Costs	23.62	64.96	70.87	22.43	47.25	49.34	18.97	42.49
Labor, Field Activities	10.96	8.03	7.10	7.37	5.29	4.59	5.19	6.93
Other Inputs & Fees, Pre-harvest	13.73	15.10	16.63	9.12	16.48	8.47	15.82	13.62
Post-harvest Expenses	84.84	81.48	92.40	81.48	86.52	81.48	91.14	85.62
Total Operating Expenses	**439.69**	**495.18**	**571.97**	**474.67**	**559.75**	**446.62**	**535.89**	**503.40**
Returns to Operating Expenses	**404.67**	**315.74**	**347.63**	**336.25**	**301.33**	**364.30**	**371.17**	**348.73**
Capital Recovery & Fixed Costs	73.43	66.28	61.56	97.15	57.94	86.13	55.45	71.13
Total Specified Expenses[1]	**513.12**	**561.46**	**633.53**	**571.81**	**617.69**	**532.75**	**591.34**	**574.53**
Returns to Specified Expenses	**331.24**	**249.46**	**286.07**	**239.11**	**243.39**	**278.17**	**315.72**	**277.59**
Operating Expenses/Bu	2.18	2.55	2.60	2.45	2.72	2.30	2.47	2.47
Total Expenses/Bu	2.54	2.89	2.88	2.95	3.00	2.75	2.73	2.82

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

Table 12. Summary of Revenue and Expenses per Acre for the 2010 Grain Sorghum Research Verification Field.

		County
Receipts		Woodruff
Yield (bu.)		117
Price Received		4.62
Total Crop Revenue		**540.54**
Operating Expenses		
Seed		19.08
Fertilizers & Nutrients		98.87
Chemicals		33.59
Custom Applications		11.00
Fuel & Lube		12.60
Repairs & Maintenance		10.46
Irrigation Energy Costs		29.53
Labor, Field Activities		4.71
Other Inputs & Fees, Pre-harvest		10.85
Post-harvest Expenses		26.91
Total Operating Expenses		**257.60**
Returns to Operating Expenses		**282.94**
Capital Recovery & Fixed Costs		52.34
Total Specified Expenses[1]		**309.95**
Returns to Specified Expenses		**230.59**
Operating Expenses/Yield Unit		2.20
Total Expenses/Yield Unit		2.65

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