



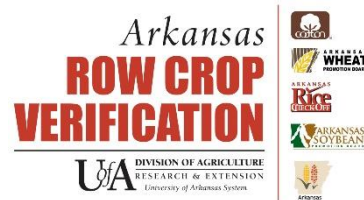
DIVISION OF AGRICULTURE
RESEARCH & EXTENSION

University of Arkansas System

2019
University of Arkansas
Corn and Grain Sorghum Research
Verification Program

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University of Arkansas
Cooperative Extension Service
Agriculture Experiment Station
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CORN & GRAIN SORGHUM RESEARCH VERIFICATION PROGRAM, 2019

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INTRODUCTION

The 2019 growing season was the twentieth 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 2019 for a total of ten corn fields. The fields were located on commercial farms and ranged in size from 15 to 146 acres with an average field size of 61.4 acres.

The 2019 CGSRVP corn fields were in Arkansas, Chicot, Clay, Desha, Jefferson, Lawrence, Mississippi, Monroe, Prairie, and White Counties. Management decisions were based on field history, soil test results, hybrids, and data collected from each individual field during the growing season.

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

www.uaex.edu/verification
www.uaex.edu/cgsrvp

www.uaex.edu/corn
www.uaex.edu/grain-sorghum

Figure 1. Location of 2019 Corn and Grain Sorghum Research Verification Fields

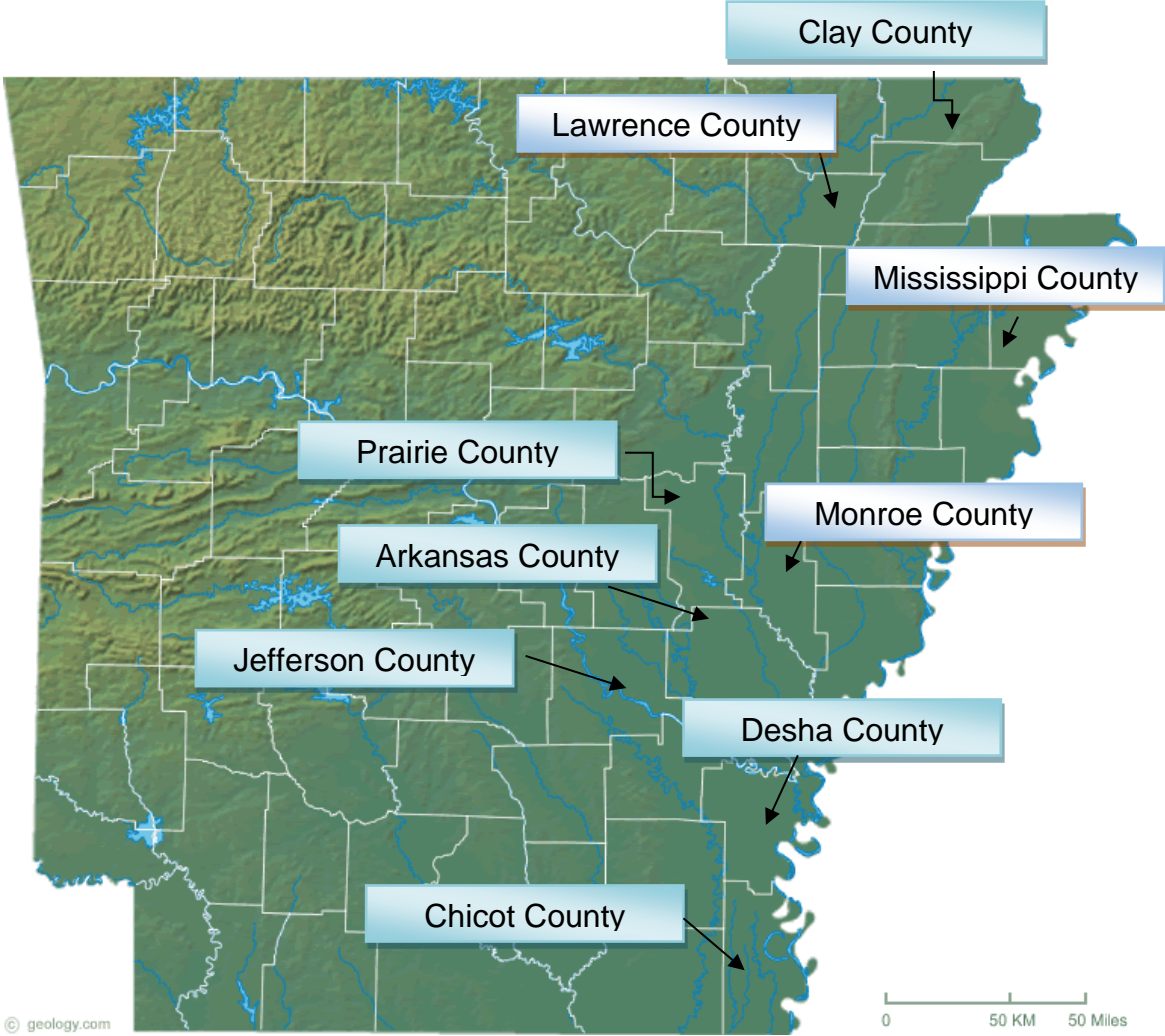


Figure 1

Corn Field

CORN FIELD REVIEWS

Arkansas County

The Arkansas County corn research verification field was located near Stuttgart on an Ethel Silt Loam. The field was 44 acres and the previous crop was soybean. The field was Kelley Resi-Till twice and field cultivated once on April 23. A pre-plant fertilizer of 50-110-115-0-5 was applied and followed by a hipper/roller on April 23. The field was planted on April 24 with AgriGold A6499 VT2RIB at 35,500 seeds per acre on 30-inch row spacing. The field emerged on April 30 and the final plant population was 33,333 plants per acre. On May 27, 3.6 pints of Halex GT and 2 quarts of atrazine were applied by the producer for weed control followed by 25 gallons per acre of 28-0-0-5 UAN. An application of 100 pounds of urea was applied on June 10 due to rainfall preventing second liquid application of nitrogen prior to corn getting too tall for ground application. Pre-tassel application of 100 pounds per acre of urea was made on June 14. Total fertilizer for this field was 220-110-115-14-5. The field was irrigated three times. The field was harvested on October 1 at 16.5% moisture and yielded 220.1 bushels per acre adjusted to 15.5% moisture.

Chicot County

The Chicot County corn research verification field was located near Macon Lake on a McGehee Silt Loam. The field was 42.2 acres and the previous crop was soybeans. A pre-plant fertilizer of 46-60-90-0-5 was applied on March 30 followed by a hipper/roller. The field was planted on April 23 with DeKalb DKC 67-44VT2P at 35,000 seeds per acre on 38-inch row spacing. The field emerged on April 30 and the final plant population was 32,800 plants per acre. On May 16, 225 pounds of urea per acre plus 100 pounds of ammonium sulfate was applied. On May 16, 3.6 pints of Halex GT, 2 quarts of atrazine, 1 ounce of permit, and 1 percent crop oil were applied per acre by the producer for weed control. A pre-tassel application of 100 pounds of urea (46 units) was applied on June 13. Total fertilizer for this field was 222-60-90-24-5. The field was furrow irrigated five times. The field was harvested on September 18 at 16% moisture and yielded 208 bushels per acre adjusted to 15.5% moisture.

Clay County

The Clay County corn research verification field was located near Knob on a Falaya Silt Loam soil. The field was 34 acres and the previous crop was soybeans. A burndown application of Makaze at 32 ounces per acre plus 12.8 ounces per acre of Salvo was applied on March 14. 51-80-80 was applied on April 1 followed by bedding. The field was planted on April 1 with DeKalb DKC 70-27VT2P at 34,000 seeds per acre on 30-inch row spacing followed the next day by a pre-emerge application of metolachlor at 1.3 pints per acre. The field emerged on April 12 and the final plant population was 33,000 plants per acre. On May 8, 225 pounds of urea per acre plus 100 pounds of ammonium sulfate was applied and 3.6 pints of Halex GT plus 2 quarts of atrazine was applied by the producer for weed control. A pre-tassel application of 100 pounds of urea (46 units) was applied on June 4. Total fertilizer for this field was 221-80-80-24-0. The field was irrigated two and a half times for a total of 5.273 acre inches of irrigation water applied. The field was harvested on September 8 at 16% moisture and yielded 232.2 bushels per acre adjusted to 15.5% moisture.

Desha County

The Desha County corn research verification field was located just south of Dumas. The field was 57 acres and the previous crop was soybeans. A burndown application was made on February 28. On April 22, a pre-plant fertilizer application of 69-90-147-0-0 was applied. The field was planted on April 24 to Mission A1687VT2P at 35,000 seeds per acre on 38-inch row spacing followed by a pre-emerge application of Verdict at 5 ounces per acre plus Zidua at 2.5 ounces per acre. The field emerged on April 30 and the final plant population was 32,500 plants per acre. 200 pounds of Urea plus 100 pounds of ammonium sulfate was applied on May 16. On May 23, 1.5 quarts of atrazine plus 3 ounces per acre of Capreno and 1.5 pints per acre of Round-Up PowerMax was applied by the producer for weed control. A pre-tassel application of 100 pounds of urea was applied on June 12. Total fertilizer for this field was 228-90-147-24-0. The field was irrigated six times. The field was harvested on September 5 at 18% moisture and yielded 207.7 bushels per acre adjusted to 15.5% moisture.

Jefferson County

The Jefferson County corn research verification field was located near Grider Field Airport just south of Pine Bluff. The field was 146 acres and the previous crop was soybean. The field was disked, field cultivated, and had poultry litter applied at two tons/acre in the fall. On April 22, a pre-plant fertilizer application of 46-40-60-0-0 was made followed by a hipper/roller. The field was planted on April 23 with Dyna-Gro DG57VC51 at 35,000 seeds per acre on 30-inch row spacing. The field emerged on April 30 and the final plant population was 32,800 plants per acre. On April 26, a pre-emerge application of 1 quart per acre of atrazine plus 1 pint per acre of Dual II Magnum and 1.5 pints/acre of Round-Up PowerMax was made by the grower. The producer applied 235 pounds per acre of urea plus 100 pounds per acre of ammonium sulfate on May 22. On May 29, the producer applied 3.6 pints per acre of Halex GT plus 1 quart per acre of atrazine. A pre-tassel application of 100 pounds of urea was aerially applied on June 14. Total fertilizer for this field was 222-40-60-24-0. The field was irrigated 5 times. The field was harvested on September 12 at 13% moisture and yielded 255.5 bushels per acre adjusted to 15.5% moisture.

Lawrence County

The Lawrence County corn research verification field was about 2 miles west of Walnut Ridge. The field was 15 acres and the previous crop was soybeans. The soil type was a Beulah Sandy Loam. A burndown application of 2-4,D at 1 pint per acre plus 1.5 pints per acre of Round-Up PowerMax was made by the producer on March 26. A mixed pre-plant fertilizer of 46-70-60-0-10 was applied on April 6 then bedded and rolled into a 48-inch bed. The field was planted on April 6 with Pioneer 1870AM at 34,000 seeds per acre on 30-inch row spacing. The field emerged on April 14 and the final plant population was 35,800 plants per acre. The producer applied 3.6 pints per acre of Halex GT and 1.5 quarts per acre of atrazine on May 8 followed by 235 pounds per acre of urea and 100 pounds per acre of ammonium sulfate. A pre-tassel application of 100 pounds of urea was aerially applied on June 10. Total fertilizer for the field was 222-70-60-24-10. The field was furrow irrigated five times. The field was harvested on September 10 at 16% moisture and yielded 220.3 bushels per acre adjusted to 15.5% moisture.

Mississippi County

The Mississippi County corn research verification field was located in the southern part of the county about 7 miles east of Tyronza. The field was 33 acres and previous crop was soybeans. The soil type was an Earle Clay. The field was field cultivated followed by hipper/roller on April 1. A mixed pre-plant fertilizer of 78-79-0-0-10 was applied on April 29 and planted to Progeny 6116VT2P at 35,000 seeds/acre on 30-inch row spacing followed by a pre-emerge application of Verdict at 10 ounces per acre on April 30. The field emerged on May 5 to a final plant population of 33,000 plants per acre. On May 31, 282 pounds of urea was applied followed by an irrigation plow. On June 3, the grower applied 2.5 quarts per acre of Acuron for weed control. A pre-tassel application of urea of 100 pounds per acre was made on June 24. Total fertilizer for the field was 254-79-0-0-10. The field was irrigated four times. The field was harvested on September 30 at 17% moisture and yielded 187.3 bushels per acre adjusted to 15.5% moisture.

Monroe County

The Monroe County corn research verification field was located about a mile east of Holly Grove. The field was 71 acres and previous crop was soybeans. The soil type was a Basket Fine Sandy Loam. The field was field cultivated on May 1. A mixed pre-plant fertilizer of 46-0-81-0-0 was applied on May 17 followed by a hipper/roller. On May 18, the field was planted to Progeny 5115VT2P at 38,000 seeds/acre on 30-inch row. Planting was delayed due to wet weather. The field emerged on May 22 to a final plant population of 38,000 plants per acre. On June 3, the grower applied 1 quart per acre of atrazine plus 2 pints per acre of glyphosate and 1 pint per acre of Dual II Magnum for weed control. On June 14, 235 pounds per acre of urea plus 100 pounds per acre of ammonium sulfate was applied followed by a herbicide application of 1 quart per acre of atrazine plus 1 ounce per acre of Permit and 2 pints per acre of glyphosate and 1 percent crop oil. A pre-tassel application of urea of 100 pounds per acre was made on July 9. Total fertilizer for the field was 221-0-81-24-0. The field was irrigated six times. The field was harvested on September 30 at 17% moisture and yielded 142 bushels per acre adjusted to 15.5% moisture.

Prairie County

The Prairie County corn research verification field was located near Des Arc on an Immanuel Silt Loam soil. The field was 110 acres and the previous crop was soybeans. A pre-plant fertilizer 46-100-108-0-10 was applied on March 26 followed by hipper/roller. The field was planted on March 27 to Dyna-Gro 57VC51 at 35,000 seeds per acre on 30-inch row spacing. The field emerged on April 9 and the final plant population was 33,000 plants per acre. On April 30, 150 pounds of urea per acre was applied and 3.6 pints of Halex GT plus 1.5 quarts of atrazine was applied by the producer for weed control. An application of urea at 130 pounds per acre was made on May 18 and a pre-tassel application of 100 pounds of urea was made on June 10. Total fertilizer for this field was 220-100-108-0-10. The field was irrigated five times. The field was harvested on September 6 at 16% moisture and yielded 195.4 bushels per acre adjusted to 15.5% moisture.

White County

The White County corn research verification field was located about 1 mile north of Griffithville. The field was 64.5 acres and previous crop was soybeans. The soil type was a Calhoun Silt Loam. A burndown application of 8 ounces per acre of dicamba plus 2 pints per acre of glyphosate was made on March 1. The field was field disked on April 1. A mixed pre-plant fertilizer of 23-0-120-0-0 was applied on April 1 followed by a hipper/roller. On May 18, the field was planted to Dyna-Gro DG 57CC51 at 38,000 seeds/acre on 30-inch row spacing. Planting was delayed due to wet weather. The field emerged on May 22 to a final plant population of 36,333 plants per acre. On June 3, the grower applied 2 quarts per acre of atrazine plus 3 ounces per acre of Capreno and 1 percent crop oil for weed control. On June 11, 36 gallons per acre of 28-0-0-5 UAN was applied followed by another application of 34 gallons per acre on July 1 (applied via high clearance sprayer using y-drops). Total fertilizer for the field was 241-0-120-39-0. The field was irrigated five times. The field was harvested on September 30 at 16% moisture and yielded 212.2 bushels per acre adjusted to 15.5% moisture.

Table 1. Agronomic information for the 2019 Corn Research Verification Fields.

County	Hybrid	Field Size (ac)	Row Space (in)	Previous Crop	Plants per acre	Plant Date	Harvest Date	Yield (bu/ac)
Arkansas	AgriGold 6499 VT2P	44	30	soybean	33,333	4/24	10/1	220.1
Chicot	DeKalb DKC67-44VT2P	42	38	soybean	32,800	4/23	9/18	208.0
Clay	DeKalb DKC70-27VT2P	34	30	soybean	33,000	4/1	9/8	232.2
Desha	Mission A1687VT2P	57	38	soybean	32,500	4/24	9/5	207.7
Jefferson	Dyna-Gro DG57VC51	146	30	soybean	32,800	4/23	9/12	255.5
Lawrence	Pioneer P1870AM	15	30	soybean	35,800	4/6	9/10	220.3
Mississippi	Progeny PGY 6116VT2P	30	30	soybean	33,000	4/29	9/30	187.3
Monroe	Progeny PGY 5115VT2P	71	30	soybean	39,000	5/18	9/28	142.0
Prairie	Dyna-Gro D57VC51	110	30	soybean	33,000	3/27	9/6	195.4
White	Dyna-Gro D57CC51 Conv	65	30	soybean	36,333	5/18	9/30	212.2
Average	---	61.4	---	---	33,957	4/22	9/18	208.1

Table 2. Fertility Program for 2019 Corn RVP Fields.

County	Applied Fertilizer N-P-K-S-Zn ¹ (lb/ac)			Total Applied Fertilizer N-P-K-S-Zn	Soil Classification
	Preplant	Sidedress	Pre Tassel		
Arkansas	50-110-115-0-5	124-0-0-14-0	46-0-0-0-0	220-110-115-14-5	Ethel Silt loam
Chicot	46-60-90-0-5	130-0-0-24-0	46-0-0-0-0	222-60-90-24-5	McGehee Silt Loam
Clay	51-80-80-0-0	124-0-0-24-0	46-0-0-0-0	221-80-80-24-0	Falaya Silt Loam
Desha	69-90-147-0-0	113-0-0-24-0	46-0-0-0-0	228-90-147-24-0	Herbert Silt Loam
Jefferson	2 Tons Litter+ 46-40-60-0-0	130-0-0-24-0	46-0-0-0-0	222-40-60-24-0	Rilla Silt Loam
Lawrence	46-70-60-0-10	130-0-0-24-0	46-0-0-0-0	222-70-60-24-10	Beulah Sandy Loam
Mississippi	78-79-0-0-10	130-0-0-0-0	46-0-0-0-0	254-79-0-0-10	Earle Clay
Monroe	46-0-81-0-0	129-0-0-24-0	46-0-0-0-0	221-0-81-24-0	Bosket Fine Sandy Loam
Prairie	46-100-108-0-10	128-0-0-24-0	46-0-0-0-0	220-100-108-0-10	Immanuel Silt Loam
White	23-0-120-0-0	112-0-0-20-0	106-0-0-19-0	241-0-120-39-0	Calhoun Silt Loam

Table 3. Pesticide information for the 2019 Corn Research Verification fields.

County	Herbicide	Insecticide	Fungicide
Arkansas	1 qt/acre glyphosate + 1 qt/acre 2,4-D + 1 oz Sharpen, 3.6 pt/acre Halex GT + 2 qt/acre atrazine + 1% crop oil	None	None
Chicot	1 qt/acre glyphosate + 1 qt/acre atrazine, 3.6 pt/acre Halex GT + 1 qt/acre atrazine + 1% crop oil	None	None
Clay	1 qt/acre glyphosate + 12.8 oz Salvo, 3.6 pt/acre Halex GT + 2 qt/acre atrazine + 1% crop oil	None	None
Desha	1 oz/acre Elevore + 1 qt/acre glyphosate + 16 oz/acre Volunteer, 5 oz/acre Verifact + 2 oz per acre Zidua SC, 3.6 pt/acre Halex GT + 1.5 qt/acre atrazine	None	None
Jefferson	1 pt/acre Dual II Magnum + 1.5 pt/acre Round-Up PMax + 1 qt/acre atrazine, 3.6 pt/acre Halex GT + 1 qt/acre atrazine + 1% crop oil	None	None
Lawrence	1.5 pt/acre Round-Up PMax + 1 pt/acre 2-4,D, 3.6 pt/acre Halex GT + 1.5 qt/acre atrazine + 1% crop oil	None	None
Mississippi	10 oz/acre Verdict, 2.5 qt/acre Accuron	None	None
Monroe	1 qt/acre glyphosate + 1 qt/acre atrazine + 1 pt/acre Dual II Magnum, 3.6 pt/acre Halex GT + 1 qt/acre atrazine + 1% crop oil	None	None
Prairie	3.6 pt/acre Halex GT + 2 qt/acre atrazine	None	None
White	1 qt/acre glyphosate + 8 oz/acre dicamba (in burndown), 2 qt/acre atrazine + 3 oz/acre Capreno	None	None

Table 4. Irrigation type, frequency, and rainfall totals for the 2019 growing season.

County	Irrigation Type	*Number of Irrigations	**Rainfall (in) Planting to Black Layer (R6)
Arkansas	Furrow	3	18.99
Chicot	Furrow	5	23.40
Clay	Furrow	2.5	25.30
Desha	Furrow	6	17.02
Jefferson	Furrow	5	22.45
Lawrence	Furrow	5	23.59
Mississippi	Furrow	4	16.90
Monroe	Furrow	6	15.71
Prairie	Furrow	5	22.50
White	Furrow	5	15.86

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

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

Table 5. Corn growth stages and corresponding Growing Degree Days for the 2019 Corn Research Verification Fields. *

Growth Stage	Accumulated Growing Degree Days (GDD50)										
	Arkan.	Chicot	Clay	Desha	Jeff.	Law.	Miss.	Monroe	Prairie	White	Avg
VE	135	142	151	153	155	121	134	129	158	124	140
V2	312	318	331	297	280	289	270	242	297	264	290
V4	469	449	458	434	419	432	418	434	443	421	438
V6	630	636	663	609	598	585	640	626	590	531	545
V8	775	812	778	809	765	779	820	816	781	718	785
V10	974	1012	947	1003	925	945	973	964	963	858	956
V12	1083	1180	1099	1140	1059	1095	1076	1125	1104	1004	1097
V14	1244	1275	1229	1252	1254	1223	1222	1327	1235	1143	1240
V16	1368	1408	1349	1362	1351	1374	1340	1418	1345	1371	1369
R1	1539	1585	1532	1508	1536	1514	1501	1561	1525	1580	1538
R2	1604	1699	1665	1648	1676	1676	1653	1701	1698	1708	1673
R3	1751	1852	1799	1818	1850	1882	1832	1838	1869	1872	1836
R4	2025	2023	2003	2030	2027	2062	1973	2030	2011	2044	2023
R5	2180	2229	2223	2176	2197	2228	2127	2234	2160	2290	2204
R6	2818	2832	2826	2858	2828	2901	2783	2889	2778	2902	2842

*Based on weekly field visits

Economic Analysis – Bob Stark

This section provides information on production costs for the 2019 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 10 corn fields 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. There were no grain sorghum fields in the research verification program in 2019 due to low state acreage.

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 2019 Crop Enterprise Budgets published by the Cooperative Extension Service, information provided by the producer cooperators, input data files from the Mississippi State Budget Generator, and communications with input company representatives. Fuel and repair costs for machinery are calculated using a budget calculator based on parameters and standards established by the American Society of Agricultural and Biological Engineers. Machinery repair costs should be regarded as estimated values for full service repairs, and actual cash outlays could differ as producers utilize employee labor or provide unpaid labor for equipment maintenance.

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

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

Operating costs, total costs, costs per bushel, and returns are presented in Table 6 for the ten corn fields in the 2019 program. 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 7. Price received for corn of \$3.75/bu was provided by Breana Watkins and represents her 2019 average for the most active weeks of the harvest period. Average corn yield from the verification fields harvested for grain is 208.05 bu/acre.

Average Total Operating Expenses for the corn fields harvested for grain in Table 7 are \$551.83 per acre. Table 7 indicates that fertilizer and nutrient costs is the largest expense category at \$165.04 per acre, or 29.91% of Total Operating Expenses.

With average corn yield of 208.05 bu/acre, average operating costs are \$2.70/bu in Table 6. Total Operating Costs range from a low of \$447.00 in the White County field to a high of \$639.04 in Desha County. Returns to Operating Costs average \$228.37 per acre. Returns to

Operating Costs have a low of \$3.65 in Monroe County and a high of \$348.00 in the White County field.

Average Fixed Cost is \$96.45 which leads to an Average Total Cost of \$648.28 per acre. Returns to Total Cost averages \$131.92 per acre with a low of \$-103.88 in Monroe County and a high of \$236.73 in the Jefferson County field. Total Specified Cost averages \$3.18/bu.

Table 6. Operating Costs, Total Costs, and Returns, 2019 Corn RVP in dollars

Fields	Operating Costs	Operating Costs/Bu	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs/Bu
Arkansas	570.74	2.59	254.63	101.01	671.75	153.63	3.05
Chicot	496.82	2.39	283.18	89.35	586.17	193.83	2.82
Clay	575.61	2.48	295.14	82.19	657.81	212.94	2.83
Desha	639.04	3.08	139.95	99.27	738.30	40.68	3.55
Jefferson	622.19	2.44	355.94	99.20	721.39	236.73	2.82
Lawrence	534.51	2.43	291.62	82.06	616.57	209.56	2.80
Mississippi	539.16	2.88	163.21	101.67	640.84	61.54	3.42
Monroe	528.85	3.72	3.65	107.53	636.38	-103.88	4.48
Prairie	560.40	2.89	168.35	87.68	652.08	80.67	3.34
White	447.00	2.11	348.00	114.54	561.54	233.46	2.65
Average	551.83	2.71	225.98	96.45	650.67	129.53	3.18

Table 7. 2019 Corn RVP, Summary of Revenue and Expenses per Acre ⁽¹⁾

	Ark.	Chicot	Clay	Desha	Jeff.	Law.	Miss.	Monroe	Prairie	White	Avg
Revenue											
Yield: (Bu/A)	220.1	208.0	232.2	207.7	255.5	220.3	187.3	142.0	195.4	212.0	208.05
Price: (\$/Bu)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
Total Crop Revenue	825.38	780.00	870.75	778.88	958.13	826.13	702.38	532.50	732.75	795.00	780.19
Expenses											
Seed	137.56	135.63	131.75	135.63	135.63	131.75	135.63	147.25	135.63	106.88	133.33
Fertilizers	172.90	113.13	180.44	210.44	195.88	151.68	169.95	138.44	213.75	103.81	165.04
Herbicides (2)	49.02	54.56	41.75	76.40	46.50	34.21	45.16	55.57	25.65	37.58	46.64
Insecticide (2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fungicide (2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Chemicals (2)	0.00	0.00	0.00	4.88	0.00	0.00	0.00	0.00	0.00	0.00	0.49
Custom Applications	16.00	8.00	24.00	18.00	15.50	30.50	7.50	23.00	8.00	15.00	17.35
Diesel, Field Activity(3)	18.98	15.93	13.85	15.97	15.71	12.24	19.88	19.76	16.62	19.24	16.82
Irrigation Energy Costs	7.90	13.17	15.57	15.81	29.53	13.17	10.54	10.54	13.17	2.60	13.20
Other Inputs (Polypipe)	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88
Input Costs											
Fees	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Crop Insurance	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00
Repairs & Maintenance inc Employee Labor	22.36	19.43	18.21	21.89	22.18	17.56	20.21	22.16	18.29	23.39	20.57
Labor, Field Activities	11.47	9.71	10.06	9.08	9.83	9.73	10.96	12.91	9.73	10.82	10.43
Production Expenses											
Interest	12.62	10.79	12.61	14.60	13.58	11.65	12.17	12.44	12.75	9.41	12.33
Post-harvest Expenses	99.05	93.60	104.49	93.48	114.98	99.14	84.29	63.90	87.93	95.40	93.63
Total Operating Expenses	570.74	496.82	575.61	639.04	622.19	534.51	539.16	528.85	564.40	447.00	554.22
Returns to Operating Expenses	254.63	283.18	295.14	139.95	335.94	291.62	163.21	3.65	168.35	348.00	225.98
Capital Recovery & Fixed Costs	101.01	89.35	82.19	99.27	99.20	82.06	101.67	107.53	87.68	114.54	96.45
Total Specified Expenses	671.75	586.17	657.81	738.30	721.39	616.57	640.84	636.38	652.08	561.54	650.67
Returns to Specified Expenses	153.63	193.83	212.94	40.68	236.73	209.56	61.54	-103.88	80.67	233.46	129.53
Operating Expenses/bu.	2.59	2.39	2.48	3.08	2.44	2.43	2.88	3.72	2.89	2.11	2.71
Total Specified Expenses/bu.	3.05	2.82	2.83	3.55	2.82	2.80	3.42	4.48	3.34	2.65	3.18
(1) Does not include land costs, management or other costs associated with production (2) Combined as Chemicals in some previous reports, (3) Listed as fuel and lube in previous reports											