

Economic Summary of 2022 Arkansas Hay Verification Program

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Introduction and Program

This report summarizes results from the 2022 Arkansas Hay Verification Program. The Arkansas Hay Verification Program (AHVP) is a collaborative effort between Arkansas forage producers, county extension agents, and state extension specialists. The goal of AHVP is to implement extension recommendations for increased hay production in accordance with goals established by both the producer and the county extension agent. The aim is to assist hay producers in Arkansas to improve the production and quality of their hay and forage resources.

The 2022 hay season was the first official year of AHVP. Eight hay fields from seven farms participated in the 2022 AHVP and were all located in the Ozark district. Participating farms are from Cleveland, Faulkner, Franklin, Izard, Marion, Van Buren and White counties. Table 1 summarizes acreage and production for participating farms. The total acreage participating in 2022 AHVP was 252.5 acres or 36.1 acres per field. Hay production from the 2022 AHVP totaled

826.2 tons or 3.27 tons per acre. The estimated value of production from the 2022 AHVP totaled \$127,239.42.

Mississippi State University Budget Generator

Table 1. 2022 AHVP Acreage and Production.

County	Acreage	Production (Tons/Acre)	Total Production (Tons)
Cleveland	11.0	5.14	56.54
Faulkner	100.0	2.08	208.00
Franklin 1	20.0	6.36	127.20
Franklin 2	17.0	4.04	68.68
Izard	10.0	5.69	56.90
Marion	46.0	2.88	132.48
Van Buren	41.0	3.93	161.13
White	7.5	2.04	15.30

The Mississippi State University (MSU) farm budget generator is a tool developed by the university's extension service to help farmers and ranchers in Mississippi develop budgets for their agricultural operations. The generator allows users to input information specific to their operation, such as crop type, acreage and expected yields, as well as costs for inputs such as seed, fertilizer and labor. The tool then generates a budget that estimates expected revenue and expenses and profitability

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measures such as net income and return on investment.

Participating farms worked with county extension agents to collect and record production and economic data that was used as an input into the Mississippi State budget generator. Budgets for each farm are in Appendix A, and each table reports revenue from hay production. A price of \$154/ton is used as a placeholder. Operating, fixed, and total specified costs are calculated for each farm. Operating costs (total direct costs) are costs used in the production of the crop and generally include herbicides, fertilizers, insecticides, fuel, custom rate application and labor. Hay hauling was assumed to be a separate farm enterprise. Fixed costs include depreciation, interest, and taxes and housing costs on tractors and equipment. Total specified costs are operating costs plus fixed costs.

Summary of Budgets

Table 2 reports summary information from each hay budget. Operating costs averaged \$375.14/acre with a range of \$192.96/acre in White County to \$577.50/acre in Van Buren County. Among all items, fertilizer represented the largest proportion of operating costs at 63 percent. Farms in the 2022 AHVP averaged \$244.43/acre on fertilizer (including poultry litter), with a range of \$92.00/acre in White County to \$428.15/acre in Van Buren County. Higher fertilizer expenses were positively correlated with per-acre hay yields. A negative correlation was observed between fertilizer expenses and breakeven hay prices, except for Van Buren County. Realized yield gains offset the higher costs of applying fertilizer.

Farms participating in the 2022 AHVP had fixed costs averaging \$46.89/acre. Depreciation on tractors averaged \$23.84/acre. Depreciation on implements was, on average, \$23.05/acre. Larger farms had lower fixed costs per acre reflecting economies of scale.

Breakeven prices are calculated by dividing total specified costs by production per acre (tons/acre). Note breakeven refers to the hay price where revenue equals costs. The average

Table 2. 2022 AHVP Costs, Returns and Breakeven Prices.

County	Total Direct Costs \$/ac	Total Specified Costs \$/ac	Net Returns ^a \$/ac	Breakeven ^b Price \$/ton
Cleveland	\$370.66	\$425.20	\$366.36	\$82.72
Faulkner	\$281.50	\$322.18	-\$1.86	\$154.89
Franklin 1	\$473.98	\$526.74	\$95.42	\$82.82
Franklin 2	\$443.05	\$496.17	\$483.27	\$122.81
Izard	\$430.16	\$473.19	\$403.07	\$83.16
Marion	\$231.34	\$262.32	\$181.20	\$91.08
Van Buren	\$577.50	\$632.71	-\$27.49	\$160.99
White	\$192.96	\$237.78	\$76.38	\$116.56

^aNet returns, revenue minus total specified costs, estimated using \$154/ton for hay prices.

^bTotal specified expenses divided by hay production per acre.

breakeven price of hay among farms in the 2022 AHVP was \$111.88/ton and ranged from \$82.72/ton to \$160.99/ton. It is recommended that farms get accurate estimates for bale weights and price hay on a per-ton basis because bales are not a standard unit of measurement and do not accurately reflect the value of production when priced on that basis.

The Livestock Marketing Information Center forecasts a 16 percent year-over-year increase in national hay prices for the 2022-2023 marketing year. Arkansas hay prices for the 2021-2022 marketing year averaged \$133/ton (USDA-NASS, 2022). Based on past prices and LMIC forecasts, Arkansas hay prices will average \$154/ton for the 2022-2023 marketing year. The \$154/ton hay price forecast is the price used to estimate revenue and net returns. Net returns, returns above total specified costs, for 2022 AHVP farms averaged \$197.04/acre with a range of -\$27.49/acre to \$483.27/acre.

Appendix A. Farm Budgets¹

Table A.1: Estimated costs and returns per acre,
Cleveland County, AR, 2022

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bahiagrass	tons	\$154.00	5.14	\$791.56
TOTAL INCOME				\$791.56
DIRECT EXPENSES				
<i>FERTILIZER</i>				
Litter	tons	\$10.00	2.00	\$20.00
Urea + Potash	lbs	\$0.62	150.00	\$93.00
Urea + Potash 2	lbs	\$0.41	225.00	\$92.25
<i>HERBICIDE</i>				
Latigo	pints	\$7.51	1.50	\$11.27
<i>OTHER</i>				
Netwrap	bale	\$1.35	11.40	\$15.39
<i>CUSTOM FERTILIZER</i>				
Custom Spread	acre	\$7.00	4.00	\$28.00
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	2.08	\$31.82
<i>HAND LABOR</i>				
Implements	hour	\$9.06	0.03	\$0.28
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	11.26	\$37.06
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$26.22	1.00	\$26.22
Tractors	acre	\$4.36	1.00	\$4.36
INTEREST ON OP. CAP.	acre	\$11.01	1.00	\$11.01
TOTAL DIRECT EXPENSES				\$370.66
RETURNS ABOVE DIRECT EXPENSES				\$420.90
FIXED EXPENSES				
Implements	acre	\$29.15	1.00	\$29.15
Tractors	acre	\$25.39	1.00	\$25.39
TOTAL FIXED EXPENSES				\$54.54
TOTAL SPECIFIED EXPENSES				\$425.20
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$366.36

Table A.2: Estimated costs and returns per acre,
Faulkner County, AR, 2022

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bermuda hay	ton	\$154.00	2.08	\$320.32
TOTAL INCOME				\$320.32
DIRECT EXPENSES				
<i>FERTILIZER</i>				
Ammonium Nitrate	lbs	\$0.41	200.00	\$82.00
<i>OTHER</i>				
Netwrap	bale	\$1.35	5.07	\$6.84
<i>CUSTOM FERTILIZER</i>				
Custom Spread	acre	\$7.00	2.00	\$14.00
Fertilizer	tons	\$50.00	2.00	\$100.00
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	1.52	\$23.15
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	8.19	\$26.96
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$19.53	1.00	\$19.53
Tractors	acre	\$3.27	1.00	\$3.27
INTEREST ON OP. CAP.	acre	\$5.75	1.00	\$5.75
TOTAL DIRECT EXPENSES				\$281.50
RETURNS ABOVE DIRECT EXPENSES				\$38.82
FIXED EXPENSES				
Implements	acre	\$21.72	1.00	\$21.72
Tractors	acre	\$18.96	1.00	\$18.96
TOTAL FIXED EXPENSES				\$40.68
TOTAL SPECIFIED EXPENSES				\$322.18
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				-\$1.86

Footnote:¹ The mention in this report of any commercial product does not imply its endorsement by MSU-ES, MAFES, or USDA over other products not named nor does the omission imply they are not satisfactory.

Table A.3.1: Estimated costs and returns per acre,
Franklin County, AR, 2022

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bermuda	tons	\$154.00	4.04	\$622.16
TOTAL INCOME				\$622.16
DIRECT EXPENSES				
<i>FERTILIZER</i>				
Clean Out Litter	tons	\$20.00	2.50	\$50.00
Ammonium Nitrate	lbs	\$0.41	544.00	\$223.04
Potash (60% K2O)	cwt	\$42.25	1.00	\$42.25
<i>HERBICIDE</i>				
Glyphosate	oz	\$0.26	32.00	\$8.32
Patriot	oz	\$3.56	1.00	\$3.56
Rezilon	oz	\$9.00	3.00	\$27.00
<i>CUSTOM FERTILIZER</i>				
Custom Spread	acre	\$7.00	3.00	\$21.00
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	1.78	\$27.23
<i>HAND LABOR</i>				
Implements	hour	\$9.06	0.03	\$0.26
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	10.01	\$32.94
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$22.89	1.00	\$22.89
Tractors	acre	\$4.84	1.00	\$4.84
INTEREST ON OP. CAP.	acre	\$10.65	1.00	\$10.65
TOTAL DIRECT EXPENSES				\$473.98
RETURNS ABOVE DIRECT EXPENSES				\$148.18
FIXED EXPENSES				
Implements	acre	\$24.61	1.00	\$24.61
Tractors	acre	\$28.15	1.00	\$28.15
TOTAL FIXED EXPENSES				\$52.76
TOTAL SPECIFIED EXPENSES				\$526.74
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$95.42

Table A.3.2: Estimated costs and returns per acre,
Franklin County, AR, 2022

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bermuda	tons	\$154.00	6.36	\$979.44
TOTAL INCOME				\$979.44
DIRECT EXPENSES				
<i>FERTILIZER</i>				
Cake Litter	tons	\$20.00	1.90	\$38.00
Ammonium Nitrate	lbs	\$0.41	550.00	\$225.50
Potash (60% K2O)	cwt	\$42.25	1.00	\$42.25
<i>HERBICIDE</i>				
Princept	oz	\$0.19	32.00	\$6.08
Patriot	oz	\$3.56	1.00	\$3.56
Glyphosate	oz	\$0.26	32.00	\$8.32
<i>CUSTOM FERTILIZER</i>				
Custom Spread	acre	\$7.00	3.00	\$21.00
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	1.78	\$27.23
<i>HAND LABOR</i>				
Implements	hour	\$9.06	0.03	\$0.26
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	10.01	\$32.94
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$22.89	1.00	\$22.89
Tractors	acre	\$4.90	1.00	\$4.90
INTEREST ON OP. CAP.	acre	\$10.12	1.00	\$10.12
TOTAL DIRECT EXPENSES				\$443.05
RETURNS ABOVE DIRECT EXPENSES				\$536.39
FIXED EXPENSES				
Implements	acre	\$24.61	1.00	\$24.61
Tractors	acre	\$28.51	1.00	\$28.51
TOTAL FIXED EXPENSES				\$53.12
TOTAL SPECIFIED EXPENSES				\$496.17
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$483.27

Table A.4: Estimated costs and returns per acre,
Izard County, AR, 2022

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bermuda	tons	\$154.00	5.69	\$876.26
TOTAL INCOME				\$876.26
DIRECT EXPENSES				
<i>FERTILIZER</i>				
Fertilizer	lbs	\$0.46	150.00	\$69.00
Poultry Litter	tons	\$27.00	2.00	\$54.00
<i>HERBICIDE</i>				
Glyphosate	pts	\$6.00	1.00	\$6.00
Patriot	oz	\$2.18	0.50	\$1.09
<i>CUSTOM FERTILIZER</i>				
Custom Spread	acre	\$7.00	3.00	\$21.00
Poultry Litter	tons	\$46.00	4.00	\$184.00
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	2.26	\$34.44
<i>HAND LABOR</i>				
Implements	hour	\$9.06	0.03	\$0.26
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	8.79	\$28.93
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$20.32	1.00	\$20.32
Tractors	acre	\$3.07	1.00	\$3.07
INTEREST ON OP. CAP.	acre	\$8.05	1.00	\$8.05
TOTAL DIRECT EXPENSES				\$430.16
RETURNS ABOVE DIRECT EXPENSES				\$446.10
FIXED EXPENSES				
Implements	acre	\$25.13	1.00	\$25.13
Tractors	acre	\$17.90	1.00	\$17.90
TOTAL FIXED EXPENSES				\$43.03
TOTAL SPECIFIED EXPENSES				\$473.19
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$403.07

Table A.5: Estimated costs and returns per acre,
Marion County, AR, 2022

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bermuda hay	ton	\$154.00	2.88	\$443.52
TOTAL INCOME				\$443.52
DIRECT EXPENSES				
<i>FERTILIZER</i>				
Urea and Potash	lbs	\$0.21	260.80	\$54.77
Urea and Potash Fall	lbs	\$0.25	261.00	\$65.25
<i>HERBICIDE</i>				
Patriot	oz	\$3.75	0.76	\$2.85
Roundup	qt	\$9.50	1.00	\$9.50
Top Surf	qt	\$11.85	0.11	\$1.29
Class Act	gal	\$12.95	0.07	\$0.84
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	1.18	\$18.04
<i>HAND LABOR</i>				
Implements	hour	\$9.06	0.11	\$1.02
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	17.04	\$56.05
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$14.07	1.00	\$14.07
Tractors	acre	\$2.53	1.00	\$2.53
INTEREST ON OP. CAP.	acre	\$5.13	1.00	\$5.13
TOTAL DIRECT EXPENSES				\$231.34
RETURNS ABOVE DIRECT EXPENSES				\$212.18
FIXED EXPENSES				
Implements	acre	\$16.27	1.00	\$16.27
Tractors	acre	\$14.71	1.00	\$14.71
TOTAL FIXED EXPENSES				\$30.98
TOTAL SPECIFIED EXPENSES				\$262.32
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$181.20

**Table A.6: Estimated costs and returns per acre,
Van Buren County, AR, 2022**

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bermuda/Tifton 44/Common Mix	tons	\$154.00	3.93	\$605.22
TOTAL INCOME				\$605.22
DIRECT EXPENSES				
<i>FERTILIZER</i>				
Fertilizer App 1	lbs	\$0.65	340.00	\$221.00
Fertilizer App 2	lbs	\$0.42	340.00	\$142.80
Fertilizer App 3	lbs	\$0.39	165.00	\$64.35
<i>HERBICIDE</i>				
Glyphosate+Patriot	qt	\$21.63	1.00	\$21.63
Glyphosate	oz	\$0.26	10.00	\$2.60
<i>CUSTOM FERTILIZER</i>				
Custom Spread	acre	\$7.00	2.83	\$19.78
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	1.74	\$26.58
<i>HAND LABOR</i>				
Implements	hour	\$9.06	0.10	\$0.92
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	12.67	\$41.69
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$16.19	1.00	\$16.19
Tractors	acre	\$6.35	1.00	\$6.35
INTEREST ON OP. CAP.	acre	\$13.61	1.00	\$13.61
TOTAL DIRECT EXPENSES				\$577.50
RETURNS ABOVE DIRECT EXPENSES				\$27.72
FIXED EXPENSES				
Implements	acre	\$18.33	1.00	\$18.33
Tractors	acre	\$36.88	1.00	\$36.88
TOTAL FIXED EXPENSES				\$55.21
TOTAL SPECIFIED EXPENSES				\$632.71
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				-\$27.49

**Table A.7: Estimated costs and returns per acre,
White County, AR, 2022**

ITEM	UNIT	PRICE	QUANTITY	TOTAL AMOUNT
INCOME				
Bermuda Mix	tons	\$154.00	2.04	\$314.16
TOTAL INCOME				\$314.16
DIRECT EXPENSES				
<i>OTHER</i>				
Netwrap	bale	\$1.35	4.53	\$6.12
<i>CUSTOM FERTILIZER</i>				
Poultry Litter	tons	\$46.00	2.00	\$92.00
Custom Spread	acre	\$7.00	1.00	\$7.00
<i>OPERATOR LABOR</i>				
Tractors	hour	\$15.27	1.85	\$28.25
<i>DIESEL FUEL</i>				
Tractors	gal	\$3.29	9.18	\$30.21
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$20.68	1.00	\$20.68
Tractors	acre	\$3.48	1.00	\$3.48
INTEREST ON OP. CAP.	acre	\$5.22	1.00	\$5.22
TOTAL DIRECT EXPENSES				\$192.96
RETURNS ABOVE DIRECT EXPENSES				\$121.20
FIXED EXPENSES				
Implements	acre	\$24.58	1.00	\$24.58
Tractors	acre	\$20.24	1.00	\$20.24
TOTAL FIXED EXPENSES				\$44.82
TOTAL SPECIFIED EXPENSES				\$237.78
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$76.38

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