



**DIVISION OF AGRICULTURE  
RESEARCH & EXTENSION**

*University of Arkansas System*

# 2015 University of Arkansas Division of Agriculture Wheat 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

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**ROW CROP  
VERIFICATION**

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## **Introduction**

The Wheat Research Verification Program (WRVP) represents an interdisciplinary effort of farmers, county Extension agents, Extension specialists, and researchers committed to improving the profitability of wheat production in Arkansas. The WRVP program began in 1986 under the direction of the University of Arkansas Cooperative Extension Service. The Arkansas Wheat Promotion Board has allocated the funding necessary for the WRVP program each year since its inception.

The WRVP program is designed as on-farm demonstrations of all the research-based recommendations required to grow wheat profitably in Arkansas. The WRVP program is part of the University of Arkansas Extension Service's goal of helping wheat producers make economical, agronomical, and environmentally sound decisions on their farms. The specific objectives of the program are:

1. To verify research-based recommendations for profitable wheat production in all wheat producing areas of Arkansas.
2. To develop a database for economic analysis of all aspects of wheat production to demonstrate that consistently high yields of wheat can be produced economically
3. To identify specific problems and opportunities in Arkansas wheat production for further investigation.
4. To promote timely cultural and management practices among all wheat farmers.
5. To provide training and assistance to county agents with limited expertise in wheat production.

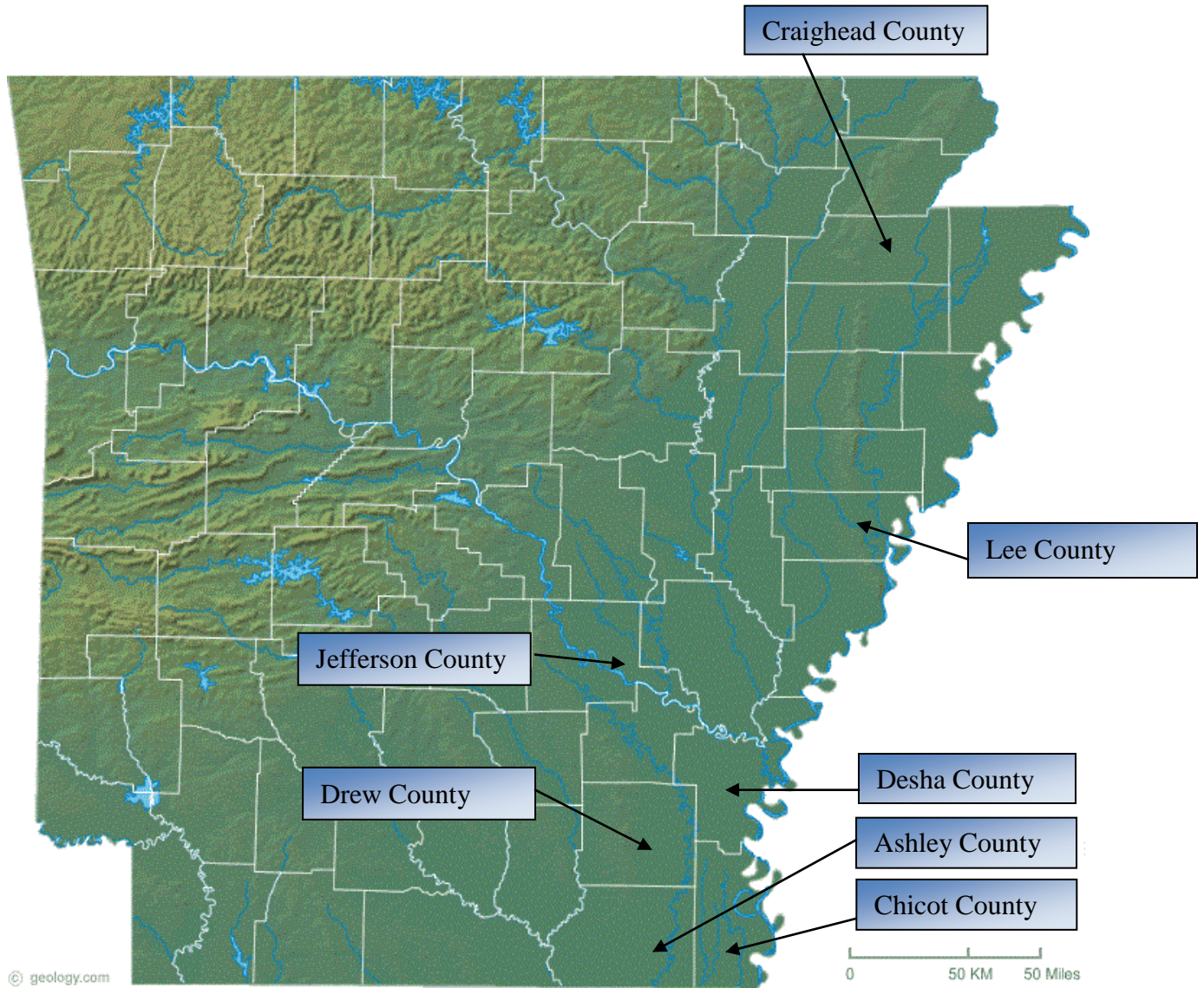
Seven producer fields were enrolled in the WRVP for the 2014-2015 growing season. Cooperators from the counties selected varieties from a short list provided by the agent and research verification coordinator. These varieties were selected based upon multi-year performance and characteristics determined by the University of Arkansas wheat variety testing program.

Soil types for fields enrolled in the program ranged from silt loam to clay, with previous crops of soybean, corn, or fallow. All fields were planted in late October to early November with seeding rates ranging from 120 to 180 lbs/acre. Five fields were drill seeded and two were broadcast. One field had one edge treated (two airplane swaths) for armyworms, however no other fields required insecticide treatment. No fields required fungicides to control foliar diseases. All fields required a herbicide with four fields having ryegrass as the main problem weed while the remaining three were treated for mainly broadleaves. The average yield for WRVP fields was 58.3 bu/acre, compared to the estimated state average yield of 56 bu/acre. Yields ranged from 35 bu/acre in Desha County to 84 bu/acre in Lee County. Wheat yields across Arkansas were lower in 2015 than in previous years due to wet weather from February through May. Wet conditions delayed spring nitrogen applications in many instances and overall

wet conditions reduced yields. Fusarium head blight levels were higher than in previous years and early flowering varieties generally had higher levels of scab than later flowering varieties. Even with higher levels of scab apparent in the field, DON levels were generally at acceptable levels. Harvested wheat acres were estimated at 240,000 acres, down from previous years.

The Wheat Research Verification Program continues to demonstrate that Extension's research-based recommendations can produce profitable, high yielding wheat across a wide range of conditions and soil types. Over a 28 year period, the WRVP has averaged approximately 13 bushels above the average state yield. The program is funded by wheat check-off dollars and is administered through the Arkansas Wheat Promotion Board.

Figure 1. Location of 2014-2015 Wheat Research Verification Program Fields



<b>County</b>	<b>Variety</b>	<b>Acres</b>	<b>Planting Method &amp; Rate</b>	<b>2014 Planting Date</b>	<b>Previous Crop</b>	<b>Yield Bu/A</b>
Ashley	Dixie McAlister	79	Broadcast 180 lbs/A	Oct. 22	Corn	64
Chicot	AgriMaxx 415	42	Drill 120 lbs/A	Nov. 3	Fallow	52
Craighead	Dixie McAlister	39	Drill 120 lbs/A	Nov. 1	Soybean	60
Desha	Armor Octane	20	Broadcast 180 lbs/A	Nov. 8	Fallow	35
Drew	Pioneer 26R41	24	Drill 120 lbs/A	Oct 21	Soybean	70
Jefferson	Progeny 870	50	Drill 120 lbs/A	Oct. 22	Soybean	43
Lee	Armor Havoc	100	Drill 120 lbs/A	Oct. 25	Soybean	84
<b>Average</b>						<b>58.3 bu/a</b>

<b>County</b>	<b>Soil Type</b>	<b>Fall Fertilizer</b>	<b>Spring Fertilizer</b>	<b>Total Spring Nitrogen</b>
Ashley	Silt Loam	0-40-60	Feb. - 100 lbs/A urea + 50 lbs/A ammonium sulfate March - 130 lbs/A urea	116
Chicot	Silt Loam, Clay	0-40-60	Feb. - 90 lbs/A urea March - 135 lbs/A urea	103
Craighead	Silt Loam	0-40-60	Feb. - 150 lbs/A urea + 50 lbs/A ammonium sulfate March - 100 lbs/A urea	125
Desha	Silt Loam	---	Feb. - 50 lbs/A urea + 100 lbx/A ammonium sulfate + 0-58-30 March - 100 lbs/A urea	90
			Feb. - 100 lbs/A urea + 50 lbs/A ammonium sulfate	

Drew	Silt Loam	0-45-59-13	sulfate March – 135 lbs/A urea	118
Jefferson	Silt Loam, Clay	0-0-100	Feb. – 100 lbs/A urea March – 140 lbs urea	110
Lee	Silt Loam	0-80-100	Feb. – 125 lbs/A urea + 75lbs/A ammonium sulfate March – 100 lbs/A urea	124
<b>Average</b>				<b>112 lbs N</b>

### **Economic Analysis – Dr. Archie Flanders**

This section reports information on production costs and returns for the 2015 Wheat Research Verification Program (WRVP). Records of field operations on each field are the basis for estimating these costs. The field records were compiled by the WRVP coordinators, county Extension agents, and cooperators. Production data from the 7 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.

Production 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 production inputs as reported by the cooperators are used in this analysis. Input prices are determined by data from the 2014 Crop Enterprise Budgets (wheat revised September 2014) published by the Cooperative Extension Service. 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 and maintenance costs should be regarded as estimated values, and actual cash outlays could differ as producers utilize employee 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 3. Costs in this report do not include land costs, management, or other expenses and fees not associated with production. Budget summaries for wheat are presented in Table 4. Price received for wheat of \$5.30/bu. is determined by the Memphis average cash price during June to mid-July of 2015. Average wheat yield is 58.2 bu./acre.

Average operating costs for wheat in Table 1 are \$265.11 per acre. Table 2 indicates that fertilizers and nutrients are the largest expense category at \$105.73 per acre, or 40% of total operating costs. Seed costs average \$59.67 per acre, and herbicides average \$16.56 per acre.

With average yield of 58.2 bu./acre, average operating costs are \$4.84/bu. Operating costs range from a low of \$238.80 per acre in Desha County to a high of \$293.78 per acre in the Lee County field. Returns to operating costs average \$43.35 per acre. The low is -\$53.30 in Desha County and the high is \$149.99 in Lee County. Average fixed costs are \$41.99 per acre which leads to average total costs of \$307.10 per acre. Returns to total costs average \$1.36 per acre with a low of -\$87.74 in Desha County and a high of \$102.05 in Lee County. Total specified costs average \$5.60/bu.

Table 3. Operating Costs, Total Costs<sup>1</sup>, and Returns

County	Operating Costs	Operating Costs per Bushel	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs per Bushel
Ashley	273.77	4.30	63.68	48.88	322.65	14.80	5.07
Chicot	246.80	4.75	28.80	35.82	282.62	-7.02	5.44
Craighead	259.23	4.32	58.77	40.79	300.02	17.98	5.00
Desha	238.80	6.82	-53.30	34.43	273.24	-87.74	7.81
Drew	275.98	3.94	95.02	40.43	316.41	54.59	4.52
Jefferson	267.42	6.22	-39.52	45.64	313.07	-85.17	7.28
Lee	293.78	3.51	149.99	47.94	341.72	102.05	4.08
<b>Average</b>	<b>265.11</b>	<b>4.84</b>	<b>43.35</b>	<b>41.99</b>	<b>307.10</b>	<b>1.36</b>	<b>5.60</b>

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



Table 4. Summary of Revenue and Expenses per Acre

Revenue	County							Average
	Ashley	Chicot	Craighead	Desha	Drew	Jefferson	Lee	
Yield (bu.)	63.7	52.0	60.0	35.0	70.0	43.0	83.7	58.2
Price (\$/bu.)	5.30	5.30	5.30	5.30	5.30	5.30	5.30	5.30
<b>Total Crop Revenue</b>	<b>337.45</b>	<b>275.60</b>	<b>318.00</b>	<b>185.50</b>	<b>371.00</b>	<b>227.90</b>	<b>443.77</b>	<b>308.46</b>
<b>Expenses</b>								
Seed	73.80	49.20	48.72	73.80	49.20	73.80	49.20	59.67
Fertilizers & Nutrients	99.60	90.33	103.70	89.11	115.05	101.20	141.15	105.73
Herbicides	4.56	22.31	15.53	25.47	19.86	13.30	14.88	16.56
Insecticides	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Other Chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom Applications	31.50	36.45	33.00	7.00	32.95	23.80	21.45	26.59
Diesel Fuel	20.75	13.55	20.05	14.24	16.75	18.42	20.11	17.69
Repairs & Maintenance <sup>1</sup>	15.80	13.47	14.57	11.19	14.91	14.68	17.18	14.54
Irrigation Energy Costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, Field Activities	6.70	4.59	4.76	4.92	5.82	6.78	5.01	5.51
Other Inputs & Fees	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Production Expenses</b>	<b>253.74</b>	<b>229.90</b>	<b>240.32</b>	<b>225.74</b>	<b>254.53</b>	<b>251.98</b>	<b>268.97</b>	<b>246.45</b>
Interest	6.03	5.46	5.71	5.36	6.05	5.98	6.39	5.85
Post-harvest Expenses	14.01	11.44	13.20	7.70	15.40	9.46	18.42	12.80
Custom Harvest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total Operating Expenses</b>	<b>273.77</b>	<b>246.80</b>	<b>259.23</b>	<b>238.80</b>	<b>275.98</b>	<b>267.42</b>	<b>293.78</b>	<b>265.11</b>
<b>Returns to Operating Expenses</b>	<b>63.68</b>	<b>28.80</b>	<b>58.77</b>	<b>-53.30</b>	<b>95.02</b>	<b>-39.52</b>	<b>149.99</b>	<b>43.35</b>
Land Rent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital Recovery & Fixed Costs	48.88	35.82	40.79	34.43	40.43	45.64	47.94	41.99
<b>Total Specified Expenses<sup>2</sup></b>	<b>322.65</b>	<b>282.62</b>	<b>300.02</b>	<b>273.24</b>	<b>316.41</b>	<b>313.07</b>	<b>341.72</b>	<b>307.10</b>
<b>Returns to Specified Expenses</b>	<b>14.80</b>	<b>-7.02</b>	<b>17.98</b>	<b>-87.74</b>	<b>54.59</b>	<b>-85.17</b>	<b>102.05</b>	<b>1.36</b>
Operating Expenses/bu.	4.30	4.75	4.32	6.82	3.94	6.22	3.51	4.84
Total Expenses/bu.	5.07	5.44	5.00	7.81	4.52	7.28	4.08	5.60

<sup>1</sup>Includes employee labor allocated to repairs and maintenance.

<sup>2</sup>Does not include land costs, management, or other expenses and fees not associated with production.