



**DIVISION OF AGRICULTURE
RESEARCH & EXTENSION**

University of Arkansas System

2014 University of Arkansas Division of Agriculture Wheat Research Verification Program

The Wheat Research Verification Program is funded by Arkansas wheat producers through check-off funds administered by the Arkansas Wheat Promotion Board.

University of Arkansas
Cooperative Extension Service
Agriculture Experiment Station
U.S. Department of Agriculture
And County Governments Cooperating

The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.

Arkansas
**ROW CROP
VERIFICATION**

U of A **DIVISION OF AGRICULTURE**
RESEARCH & EXTENSION
University of Arkansas System



Authors and Acknowledgements

Conducted by:

Chris Grimes, Program Associate
Chad Norton, Program Associate
Dr. Jason Kelley, Extension Agronomist – Wheat and Feed Grains
Dr. Archie Flanders, Extension Economist

Acknowledgments:

Cooperating Wheat Producers:

Steve Stevens - Desha County	Wink Phillips - Lawrence County
Doc Nelson - Drew County	Rickey Davidson - Phillips County
John Hartley and Jill Evans - Faulkner County	

Cooperating County Extension Agents:

Wes Kirkpatrick - Desha County	Herb Ginn - Lawrence County
Steve Kelley - Drew County	Robert Goodson - Phillips County
Hank Chaney - Faulkner County	

Cooperative Extension Service:

Dr. Trent Roberts, Soil Fertility
Dr. Leo Espinoza, Extension Soils Specialist
Dr. Glenn Studebaker, Extension Entomologist
Dr. Gus Lorenz, Extension Entomologist
Dr. Bob Scott, Extension Weed Scientist
Mr. Chris Meux, Extension Design Specialist
Dr. Robert Bacon, Department Head, Department of Crop, Soil, and Environmental Sciences

Agricultural Experiment Station:

Dr. Gene Milus, Professor, Department of Plant Pathology
Dr. Esten Mason, Assistant Professor, Wheat Breeding and Genetics

Arkansas Wheat Promotion Board Members:

Terry Dabbs	Herrick Norcross	Jackie Prince
Tim Smith	Blake Swears	Steven Tinsley
George Toll	William Turner	Barry Walls

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:

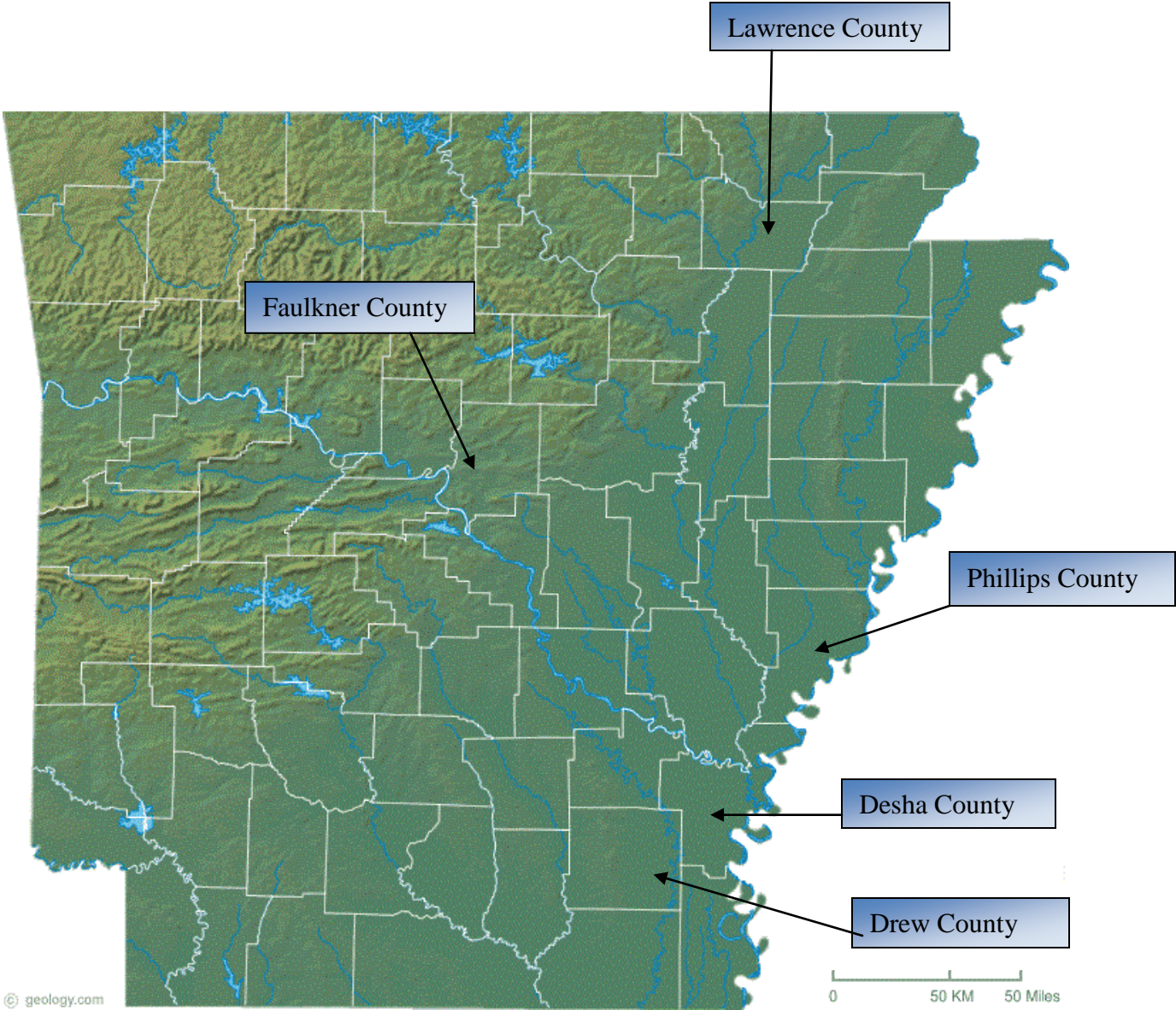
1. To verify research-based recommendations for profitable wheat production in all wheat producing areas of Arkansas.
2. To develop a database for economic analysis of all aspects of wheat production to demonstrate that consistently high yields of wheat can be produced economically
3. To identify specific 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.

Five producer fields were enrolled in the WRVP for the 2013-2014 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 sandy 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 210 lbs/acre. Four fields were broadcast seeded and one was drill seeded. No fields were treated for insects or required fungicides to control foliar diseases. All fields required a herbicide with four fields having ryegrass as the main problem weed. The average yield for WRVP fields was 65.9 bu/A, compared to the estimated state average yield of 62 bu/A. Yields ranged from 55 bu/ac in Lawrence County to 80 bu/ac in Faulkner County.

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 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 2013-2014 Wheat Research Verification Program Fields



County	Variety	Acres	Planting Method & Rate	2013 Planting Date	Previous Crop	Yield Bu/A
Desha	Delta Grow 7500	43	Broadcast 210 lbs/A	Nov. 6	Wheat	65
Drew	Dixie McAlister	31	Broadcast 150 lbs/A	Oct. 29	Soybean	65
Faulkner	Armor Rampage	50	Broadcast 120 lbs/A	Oct 23	Corn	80
Lawrence	Armor Ricochet	40	Broadcast 150 lbs/A	Oct. 30	Soybean	55
Phillips	Syngenta Beretta	44	Drill 90 lbs/A	Oct. 28	Wheat	64.5
Average						69.5bu/a

County	Soil Type	Fall Fertilizer	Spring Fertilizer	Total Spring Nitrogen
Desha	Clay Loam	---	Feb. 13 - 125 lbs/A urea + 75 lbs/A ammonium sulfate Feb 27 - 100 lbs/A urea	119
Drew	Clay	0-40-60	March 6 - 100 lbs/A urea + 50 lbs/A ammonium sulfate+ 50 lbs/A DAP March 20 - 100 lbs/A urea + 50 lbs/A ammonium sulfate	123
Faulkner	Silt Loam	26-26-26	Feb. - 100 lbs/A urea + 75 lbs/A ammonium sulfate March - 100 lbs/A urea	108
Lawrence	Sandy Loam	0-0-80	Feb 25 - 100 lbs/A urea + 50 lbs/A ammonium sulfate March 26 - 140 lbs/A urea	121
Phillips	Silt Loam	---	Feb. 15 - 125 lbs/A urea + 50lbs/A ammonium sulfate March 17 - 120 lbs/A urea	126
Average				119 lbs N

Economic Analysis – Dr. Archie Flanders

This section reports information on production costs and returns for the 2014 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 5 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.

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 2014 Crop Enterprise Budgets 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 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 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 \$6.90/bu. is determined by the Memphis average cash price during April and May of 2014. Average wheat yield is 65.9 bu./acre.

Average operating costs for wheat in Table 3 are \$222.34 per acre. Table 4 indicates that fertilizers and nutrients are the largest expense category at \$79.61 per acre, or 36% of total operating costs. Seed costs average \$48.96 per acre, and herbicides average \$20.16 per acre.

With average yield of 65.9 bu./acre, average operating costs are \$3.43/bu. Operating costs range from a low of \$182.06 in Lawrence County to a high of \$254.74 in the Drew County field. Returns to operating costs average \$231.37 per acre, and the low is \$166.33 in Lawrence County and the high is \$326.88 in Faulkner County. Average fixed costs are \$36.16 which leads to average total costs of \$259.52 per acre. Returns to total costs average \$195.19 per acre with a low of \$142.07 in Lawrence County and a high of \$277.88 in Faulkner County. Total specified costs average \$3.97/bu.

Table 3. Operating Costs, Total Costs¹, 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
Desha	241.61	3.72	206.89	40.03	281.64	166.86	4.33
Drew	254.74	3.92	193.76	30.85	285.59	162.91	4.39
Faulkner	225.12	2.81	326.88	49.19	274.32	277.68	3.43
Lawrence	213.17	3.88	166.33	24.26	237.43	142.07	4.32
Phillips	182.06	2.82	262.99	36.58	218.64	226.41	3.39
Average	223.34	3.43	231.37	36.18	259.52	195.19	3.97

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

Table 4. Summary of Revenue and Expenses per Acre

Receipts	County					Average
	Desha	Drew	Faulkner	Lawrence	Phillips	
Yield (bu)	65.0	65.0	80.0	55.0	64.5	65.9
Price (\$/bu)	6.90	6.90	6.90	6.90	6.90	6.90
Total Crop Revenue	448.50	448.50	552.00	379.50	445.05	454.71
Operating Expenses						
Seed	71.40	51.00	40.80	51.00	30.60	48.96
Fertilizers & Nutrients	60.45	103.57	90.33	89.40	54.30	79.61
Herbicides	25.12	8.91	26.45	10.80	29.52	20.16
Insecticides	0.00	0.00	0.00	0.00	0.00	0.00
Other Chemicals	6.25	11.95	0.00	0.70	0.00	3.78
Custom Applications	22.75	31.50	7.00	21.00	14.00	19.25
Diesel Fuel	17.79	11.73	13.77	11.26	15.10	13.93
Repairs & Maintenance	13.01	11.17	18.79	8.82	14.42	13.24
Irrigation Energy Costs	0.00	0.00	0.00	0.00	0.00	0.00
Labor, Field Activities	5.28	5.04	5.57	3.42	6.03	5.07
Other Inputs & Fees, Pre-harvest	5.27	5.58	4.81	4.66	3.89	4.84
Post-harvest Expenses	14.30	14.30	17.60	12.10	14.19	14.50
Custom Harvest	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Expenses	241.61	254.74	225.12	213.17	182.06	223.34
Returns to Operating Expenses	206.89	193.76	326.88	166.33	262.99	231.37
Land Rent	0.00	0.00	0.00	0.00	0.00	0.00
Capital Recovery & Fixed Costs	40.03	30.85	49.19	24.26	36.58	36.18
Total Specified Expenses¹	281.64	285.59	274.32	237.43	218.64	259.52
Returns to Specified Expenses	166.86	162.91	277.68	142.07	226.41	195.19
Operating Expenses/bu	3.72	3.92	2.81	3.88	2.82	3.43
Total Expenses/bu	4.33	4.39	3.43	4.32	3.39	3.97

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