DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

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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

Arkansas ROW CROP VERIFICATION
DIVISION OF AGRICULTURE RESEARCH & EXTENSION University of Arkansas System

ARKANSAS WHEAT PROMOTION BOARD

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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.

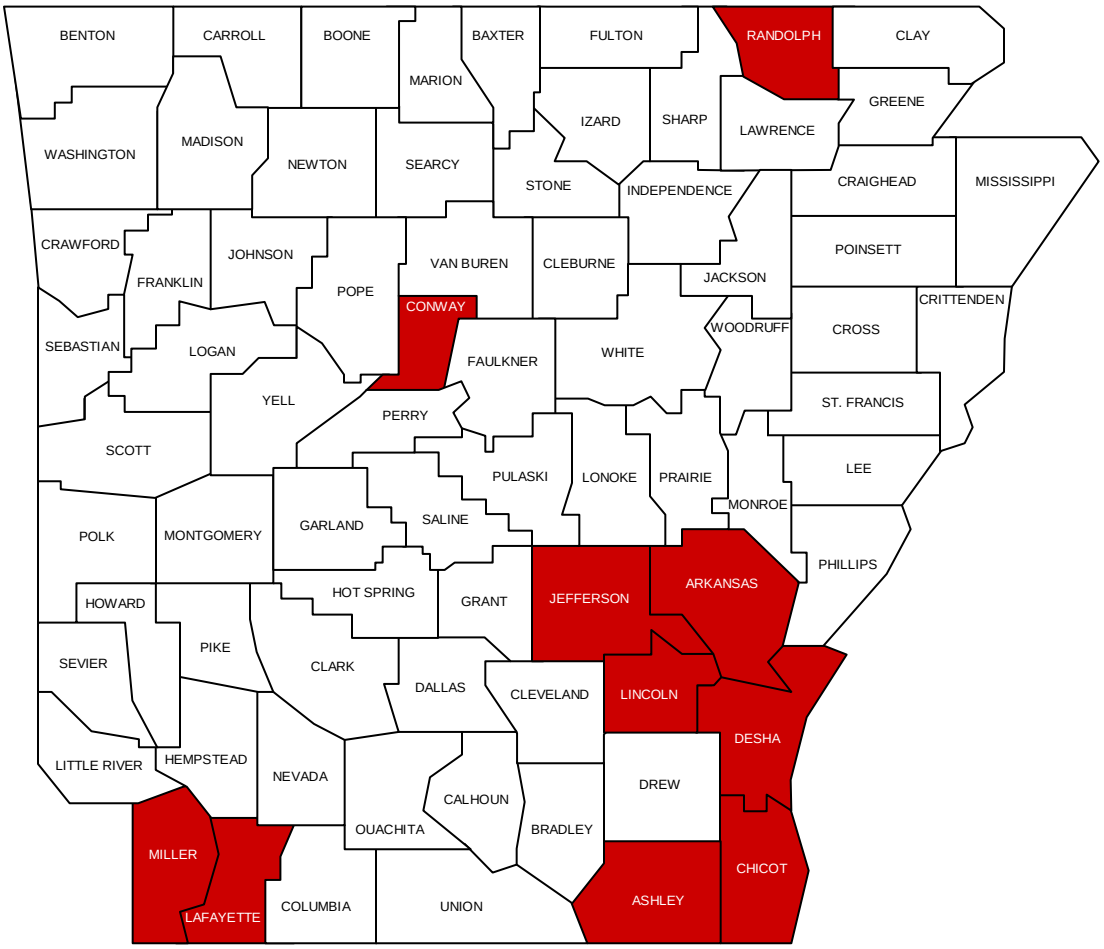
Ten producer fields were enrolled in the WRVP for the 2011-2012 growing season. Cooperators from the counties selected nine varieties from a short list provided by the agent and research verification coordinator. These varieties were selected based upon multi-year performance and characteristics determined 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, and fallow. Seeding dates ranged from September 29 to November 4, 2011, with seeding rates varying from 100 to 210 lbs/ac. Five fields were drill seeded, and five were broadcast seeded. Three fields warranted treatment for insects, and six fields required fungicide applications. Only three fields were treated with herbicides.

Harvest dates were extremely early this season, with dates ranging from May 20 – 30. The average yield for WRVP fields was 69.9 bu/A, compared to the state average of 55 bu/A. Yields ranged from 29 bu/ac in Desha County to 92 bu/ac at the Lincoln County and Conway County locations.

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 26 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 2011-2012 Wheat Research Verification Program Fields



Field Reviews

Arkansas County

The Arkansas County 70 acre field was located just north of Stuttgart on a DeWitt and Stuttgart silt loam soil. Following land preparation and pre-plant fertilizer, Armor Ricochet, was planted with a drill on October 15 at a rate of 110 lbs/A. PowerFlex was applied on November 30 for ryegrass control. Spring nitrogen was applied in a two-way split application. A fungicide was applied in mid-March for septoria leaf blotch and stripe rust control, and Karate Z was applied for armyworm control in early April. The field was harvested on May 25 with a final yield of 84 bu/A.

Ashley County

The Ashley County location was located west of Montrose on a mixed soil comprised of Perry clay, Portland clay, and Rilla silt loam. Following land preparation, pre-plant fertilizer was applied. The field was 131 acres in size, and was planted with a drill on October 17 with Progeny 117 at a rate of 120 lbs/A. Two spring nitrogen applications were applied with a total N rate of 128 lbs/A. Tilt fungicide was applied at 4 fl oz/acre in late March for stripe rust control. No herbicides or insecticides were warranted throughout the season. Harvest occurred on May 26 with a yield of 79 bu/A.

Chicot County

Terral LA841 was broadcasted at a rate of 180 lbs/A at the Chicot County location which followed a previous corn crop. No pre-plant fertilizer was required on the Sharkey clay soil. Pests were not a problem throughout the year, but heavy rainfall and poor surface drainage, during the fall and winter limited yield. 138 lbs/a of N was applied in the spring in a two-way split application. 51 bu/A was harvested on May 20.

Conway County

Armor Ricochet was broadcasted on October 21 on the 16 acre field. The soil type was a Gallion silt loam. No pre-plant fertilizer was needed, and the total spring N rate was 113 lbs/A. Quilt Xcel was applied in early April for stripe rust control. The field was harvested on May 22 with a yield of 92 bu/A.

Desha County

An application of 0-0-54 was applied following land preparation on this 18 acre field. The soil type was Rilla and Hebert silt loam. Despite the light soil texture, poor surface drainage during the fall and winter negatively impacted growth. 150 lbs/A of Delta Grow 4500 was broadcasted on November 2. 1.5 pts/A of 2,4-D was applied for garlic suppression in late February. Stripe rust was a problem very early, and 4 oz/A of Tilt was applied on March 17. 113 lbs/A of total N was applied in a two-way split application. 29 bu/A was harvested on May 30.

Jefferson County

The 22 acre Jefferson County was located at Pastoria in the northern portion of the county. Mixed fertilizer was applied at a rate of 0-70-70, and the soil type was a McGehee silt loam. The field was drill planted on November 4 with Syngenta Arcadia at a rate of 150 lbs/A. Spring nitrogen of 138 lbs/A of actual N was applied as a two-way split application. 4 oz/A of Tilt was applied on March 22 for stripe rust control. 78 bu/A was harvested on May 26.

Lafayette County

The 76 acre Lafayette County field was located west of Gin City in the southern part of the county. The soil type was a Billyhaw clay. Dixie McAlister was broadcasted on November 1 at a rate of 125 lbs/A. No pre-plant mixed fertilizer was needed. Only 70 lbs/A of N was applied due to excessive fall/winter growth and obvious residual N. A fungicide was applied at the end of March, followed by an insecticide on April 10 for armyworm control. The field was harvested on May 21 with a final yield of 88 bu/A.

Lincoln County

1.5 tons/A of lime and 2 tons/A chicken were applied during land preparation. The previous crop was corn, and the soil type consisted of Rilla and Hebert silt loam soils. The 48 acre field was broadcast planted with Delta Grow 7500 at a rate of 150 lbs/A on October 22. Harmony SG was applied in late February for garlic control. The total spring N rate was 123 lbs/A and was split applied. The armyworm population built in early April, and Karate Z was applied on April 12. Bumper fungicide was applied at 4 oz/acre in April for stripe rust control. The field was harvested on May 28 with a final yield of 92 bu/A.

Miller County

The 92 acre Miller County field was located west of Garland on a Caspiana silt loam. The field was drill planted on November 1 with Croplan 8302 at a rate of 100 lbs/A. No pre-plant fertilizer was needed, but 2.5 tons/A chicken litter had been applied prior to the previous year's corn crop. Due to drought of 2011, there was a considerable amount of residual nitrogen following the dryland corn. Only 46 lbs/A of spring N was applied in the spring. Still, this was too much nitrogen and a majority of the field lodged in April. No fungicides or insecticides were needed. A yield of 43 bu/A was harvested on May 22.

Randolph County

The Randolph County field was located south of Pocahontas. The field was 155 acres and the previous crop was corn. The soil type was 84% Bosket fine sandy loam and 16% Dundee silt loam. Coker 9553 was drill seeded at a rate of 110 lbs/A on September 29. Preplant fertilizer of 23-58-60 was applied prior to planting and 112 lbs units of spring nitrogen were applied in a two way split application. There was no insect or disease pressure in the field, and the field was harvested on May 22 with a final yield of 63 bu/A.

Table 1. General Agronomic Information								
County	**Variety**	**Acres**	**Planting Method & Rate**	**2011 Planting Date**	**Previous Crop**	**2012 Harvest Date**	**Plant Density Plants/ Sq.Ft.**	**Yield Bu/A**
Arkansas	Armor Ricochet	70	Drill 110 lbs/A	Oct. 15	Fallow	May 25	33	84
Ashley	Progeny 117	131	Drill 120 lbs/A	Oct. 17	Soybean	May 26	34	79
Chicot	Terral TV841	34	Broadcast 180 lbs/A	Oct. 25	Corn	May 20	28	51
Conway	Armor Ricochet	16.3	Broadcast 210 lbs/A	Oct. 21	Corn	May 22	41	92
Desha	Delta Grow 4500	18	Broadcast 150 lbs/A	Nov. 2	Fallow	May 30	30	29
Jefferson	Syngenta Arcadia	22	Drill 150 lbs/A	Nov. 4	Soybean	May 26	32	78
Lafayette	Dixie McAlister	76	Broadcast 125 lbs/A	Nov. 1	Soybean	May 21	31	88
Lincoln	Delta Grow 7500	48	Broadcast 150 lbs/A	Oct. 22	Corn	May 28	23	92
Miller	Croplan 8302	92	Drill 100 lbs/A	Nov. 1	Corn	May 22	30	43
Randolph	Coker 9553	165	Drill 110 lbs/A	Sept. 29	Corn	May 22	30	63
Average								**69.9**

Table 2. Soil Type and Fertilizer Inputs				
County	**Soil Classification**	**Fall Fertilizer**	**Spring Fertilizer**	**Total Spring Nitrogen**
Arkansas	DeWitt/Stuttgart silt loam	0-65-65	Feb. 27 - 100 lbs/A urea + 100 lbs/A ammonia sulfate March 7 – 120 lbs/A urea	122
Ashley	Perry/Portland clay, Rilla silt loam	0-65-65	Feb. 27 – 130 lbs/A urea + 50 lbs/A ammonia sulfate March 16 – 125 lbs/A urea	128
Chicot	Sharkey clay	-	Feb. 15 – 150 lbs/A urea March 6 – 150 lbs/A urea	138
Conway	Gallion silt loam	-	Feb. 25 – 100 lbs/A urea + 100 lbs/A ammonia sulfate March 19 – 100 lbs/A urea	113
Desha	Hebert/Rilla silt loam	0-0-54	March 1 – 100 lbs/A urea + 100 lbs/A ammonia sulfate March 29 – 100 lbs/A urea	113
Jefferson	McGehee silt loam	0-70-70	Feb. 27 – 150 lbs/A urea March 15 – 150 lbs/A urea	138
Lafayette	Billyhaw clay	-	Feb. 25 – 140 lbs/A urea + 25 lbs/A ammonia sulfate	70
Lincoln	Hebert/Rilla silt loam	2 tons/A chicken litter	Feb. 28 – 100 lbs/A urea + 50 lbs/A ammonia sulfate + 50 lbs/A DAP March 26 – 125 lbs/A urea	123
Miller	Caspiana silt loam	2.5 tons/A chicken litter	Feb. 25 – 100 lbs/A urea	46
Randolph	Bosket/Dundee silt loam	23-58-60	Feb. 24 – 100 lbs/A urea + 50 lbs/A ammonia sulfate March 15 – 120 lbs/A urea	111

Table 3. Pesticide Information			
County	**Herbicides**	**Insecticides**	**Fungicides**
Arkansas	Nov. 30, 3.5 oz/A Powerflex	April 5 1.6 oz/A Karate Z	March 14 14 oz/A Quilt Xcel
Ashley	-	-	March 22 – 4 oz/A Tilt
Chicot	-	-	-
Conway	-	-	April 3 14 oz/A Quilt Xcel
Desha	Feb. 20, 1.5 pts/A 2,4-D	-	March 17 4 oz/A Tilt
Jefferson	-	-	March 22 4 oz/A Tilt
Lafayette	-	April 10 1.67 oz/A Baythroid	March 30 5.5 oz/A Alto
Lincoln	Feb. 25, 0.8 oz/A Harmony SG	April 12 1.6 oz/A Karate Z	April 24 4 oz/A Bumper
Miller	-	-	-
Randolph	-	-	-

Economic Analysis

Dr. Archie Flanders

This section reports information on production costs for the 2012 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 10 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 2012 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 1. 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 2. Price received for wheat of $6.50/bu. is the estimated Arkansas average. This price is based on market outlook conditions at planting and information available from market reports during late May 2012. Average wheat yield is 69.9 bu/A.

Average operating costs for wheat in Table 1 are $262.36 per acre. Table 2 indicates that fertilizers and nutrients are the largest expense category at $127.37 per acre, or 49% of total operating costs. Seed costs average $40.45 per acre, and custom applications average $31.94 per acre.

With average yield of 69.9 bu/A, average operating costs are $4.11/bu. Operating costs range from a low of $158.90 in Miller County to a high of $348.76 in the Arkansas County field. Returns to operating costs averaged $192.12 per acre with a low of -$55.68 in Desha County and a high of $385.68 in Lafayette County. Average fixed costs are $31.22 which leads to average total costs of $293.58 per acre. Returns to total costs average $160.90 per acre with a low of -$88.39 in Desha County and a high of $349.13 in Lafayette County. Total specified costs average $4.60/bu.

Table 4. Operating Costs, Total Costs[1], and Returns

Field	Operating Costs	Operating Costs per Bushel	Returns to Operating Costs	Total Fixed Costs	Total Costs	Returns to Total Costs	Total Costs per Bushel
Arkansas	348.76	4.15	197.24	36.90	385.67	160.33	4.59
Ashley	304.76	3.86	208.74	35.92	340.68	172.82	4.31
Chicot	217.95	4.27	113.55	22.78	240.73	90.77	4.72
Conway	231.23	2.51	368.07	31.81	263.03	336.27	2.85
Desha	244.18	8.42	-55.68	32.72	276.89	-88.39	9.55
Jefferson	324.62	4.16	182.38	27.54	352.16	154.84	4.51
Lafayette	186.32	2.12	385.68	36.55	222.87	349.13	2.53
Lincoln	346.26	3.76	251.74	37.04	383.30	214.70	4.17
Miller	158.90	3.70	120.60	13.40	172.31	107.19	4.01
Randolph	260.64	4.14	148.86	37.54	298.18	111.32	4.73
Average	**262.36**	**4.11**	**192.12**	**31.22**	**293.58**	**160.90**	**4.60**

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

Table 5. Summary of Revenue and Expenses per Acre

	County					
Receipts	Arkansas	Ashley	Chicot	Conway	Desha	Jefferson
Yield (bu)	84.0	79.0	51.0	92.2	29.0	78.0
Price ($/bu)	6.50	6.50	6.50	6.50	6.50	6.50
Total Crop Revenue	**546.00**	**513.50**	**331.50**	**599.30**	**188.50**	**507.00**
Operating Expenses						
Seed	33.00	36.00	54.00	63.00	45.00	45.00
Fertilizers & Nutrients	172.93	175.67	99.15	80.23	112.29	185.95
Herbicides	15.05	0.00	0.00	0.00	3.02	0.00
Insecticides	4.37	0.00	0.00	0.00	0.00	0.00
Other Chemicals	14.77	5.14	0.00	19.30	5.00	5.00
Custom Applications	43.40	28.35	27.50	14.00	35.00	37.80
Diesel Fuel	19.16	16.03	9.98	13.90	14.59	12.04
Repairs & Maintenance	13.20	13.32	8.04	10.92	10.93	10.78
Irrigation Energy Costs	0.00	0.00	0.00	0.00	0.00	0.00
Labor, Field Activities	6.51	5.99	3.11	4.54	6.29	3.53
Other Inputs & Fees, Pre-harvest	7.90	6.87	4.94	5.04	5.69	7.35
Post-harvest Expenses	18.48	17.38	11.22	20.28	6.38	17.16
Custom Harvest	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Expenses	**348.76**	**304.76**	**217.95**	**231.23**	**244.18**	**324.62**
Returns to Operating Expenses	**197.24**	**208.74**	**113.55**	**368.07**	**-55.68**	**182.38**
Land Rent	0.00	0.00	0.00	0.00	0.00	0.00
Capital Recovery & Fixed Costs	36.90	35.92	22.78	31.81	32.72	27.54
Total Specified Expenses[1]	**385.67**	**340.68**	**240.73**	**263.03**	**276.89**	**352.16**
Returns to Specified Expenses	**160.33**	**172.82**	**90.77**	**336.27**	**-88.39**	**154.84**
Operating Expenses/bu	4.15	3.86	4.27	2.51	8.42	4.16
Total Expenses/bu	4.59	4.31	4.72	2.85	9.55	4.51

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

Table 5 (continued). Summary of Revenue and Expenses per acre

	County				
Receipts	Lafayette	Lincoln	Miller	Randolph	**Average**
Yield (bu)	88.0	92.0	43.0	63.0	69.9
Price ($/bu)	6.50	6.50	6.50	6.50	6.50
Total Crop Revenue	**572.00**	**598.00**	**279.50**	**409.50**	**454.48**
Operating Expenses					
Seed	37.50	45.00	13.00	33.00	40.45
Fertilizers & Nutrients	51.31	166.46	65.05	164.69	127.37
Herbicides	0.00	10.00	0.00	0.00	2.81
Insecticides	3.66	4.37	0.00	0.00	1.24
Other Chemicals	6.27	5.00	0.00	0.00	6.05
Custom Applications	25.55	47.25	53.50	7.00	31.94
Diesel Fuel	21.39	21.89	7.90	16.12	15.30
Repairs & Maintenance	11.96	12.59	3.23	14.24	10.92
Irrigation Energy Costs	0.00	0.00	0.00	0.00	0.00
Labor, Field Activities	5.32	5.67	3.19	5.83	5.00
Other Inputs & Fees, Pre-harvest	3.99	7.80	3.57	5.90	5.91
Post-harvest Expenses	19.36	20.24	9.46	13.86	15.38
Custom Harvest	0.00	0.00	0.00	0.00	0.00
Total Operating Expenses	**186.32**	**346.26**	**158.90**	**260.64**	**262.36**
Returns to Operating Expenses	**385.68**	**251.74**	**120.60**	**148.86**	**192.12**
Land Rent	0.00	0.00	0.00	0.00	0.00
Capital Recovery & Fixed Costs	36.55	37.04	13.40	37.54	31.22
Total Specified Expenses[1]	**222.87**	**383.30**	**172.31**	**298.18**	**293.58**
Returns to Specified Expenses	**349.13**	**214.70**	**107.19**	**111.32**	**160.90**
Operating Expenses/bu	2.12	3.76	3.70	4.14	4.11
Total Expenses/bu	2.53	4.17	4.01	4.73	4.60

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

Figure 1. Getting Ready to Plant in Cross County.

Figure 2. Planting in Cross County after Drill Calibration

Figure 3. Checking Emergence In Arkansas County

Figure 4. Harvest in Cross County.