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TITLE: Breeding for Improved Wheat Cultivars

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OBJECTIVES:

Develop and release wheat cultivars with high yield potential, high test weights, straw strength, winter hardiness, early maturity, and resistance to diseases common to Arkansas through pedigree, bulk population, and backcross breeding methods.

Cooperate with other public programs to identify lines adapted to Arkansas which can be released through the Foundation Seed Program and join other institutions in joint releases.

ABSTRACT:

Last fall, the line AR 9109-1 was licensed through an agreement with Delta King Seed Company, which will market the variety in Arkansas. This line will be called AR 910 and will be labeled as a Delta King variety. All of the Foundation Seed of 'Pat' and 'Sabbe' was sold last fall. Certified seed sales of both have been good.

Field work this past year (2003-04) went well. All six locations were planted in the optimum planting period. All had excellent stands with the exception of Keiser. Although Keiser was planted at the optimum time there was frequent rainfall immediately after planting and the resulting stands were so poor all the tests were abandoned for yield evaluation. However we were able to collect data for leaf rust reaction and maturity on the Wheat Observation Nursery and leaf rust reaction on the Elite Wheat Lines. During the spring, the project's work consisted primarily of fertilization and herbicide application. In addition to the normal breeding trials the Scab Observation was also planted to enhance the development of disease resistant germplasm. All plots were harvested by June 30. Yields were high. In the most advanced nursery, the Elite Wheat Lines (EWL) the experimental line AR93027-3-2 was not statistically different from all check varieties. This line is being increased for possible release.

During the winter the crossing program to produce future lines was expanded. There were over a hundred successful crosses in four efforts: 1) standard variety development, 2) scab-resistant varieties, 3) imidazolinone herbicide resistant varieties and, 4) specialty types (white and waxy wheats).

INTRODUCTION:

In Arkansas, wheat yields have increased at a rate of about 0.5 bu/A per year since 1924. Yield increases in wheat and other crops are due to improved cultural practices as well as genetic improvement. Studies in other regions have estimated that improved wheat cultivars are responsible for somewhere between 28% to 55% of the yield increases. Pathogens are also under genetic control and will select races which will attack prevalent cultivars. The absence of aggressive breeding programs would not only stop yield increases due to new cultivars but also the yield of cultivars currently grown would decrease since pests would develop which would overcome resistance.

The University of Arkansas' breeding program has stressed cultivar development through the use of adapted crosses to maximize efficiency but has continued to broaden the genetic base of the program to guard against genetic vulnerability and limited genetic improvement. The program uses a combination of the bulk and pedigree methods to minimize cost. In order to obtain high yielding, adapted cultivars, increased emphasis will be given to disease resistance. The Arkansas program unlike other programs is putting major emphasis on the development of high test weight genotypes since a substantial component of test weight is under genetic control.

MATERIALS AND METHODS:

Parents are chosen for their high-yield potential and adaptation to Arkansas conditions. Crosses are being made between genotypes with complementary traits in the greenhouse at Fayetteville. The F_1 generation is also grown in the greenhouse. Beginning with the F_2 generation, a combination of pedigree and bulk breeding methods are followed until sufficient homozygosity is reached to increase seed for yield testing.

Selected lines are then tested and re-selected in replicated yield plots. Lines selected move in a step-wise progression through the following nurseries: Wheat Observation (2 locations with one replication per location), Advanced Wheat Strains (3 locations), and Elite Wheat Lines (3 locations). Locations include Kibler, Stuttgart, Keiser, Marianna, and Rohwer. Numerous locations are used to help ensure selection of genotypes that are adapted to a number of soil types and environments. All lines in the nurseries are harvested for yield, and data is taken on test weight, lodging, maturity date, plant height, and winterhardiness. Reaction type and level of severity of diseases present is also recorded each spring. Lines that appear to have potential as cultivars are entered in the Arkansas Commercial Variety Test. The seed of each line in the Elite Wheat nursery is sent to the USDA Soft Wheat Quality Lab to be tested for baking and milling quality to ensure that the lines released from the program meet industry standards.

Other Universities in the soft wheat region have variety development programs. Evaluation of public lines initially takes place in regional uniform nurseries and then through the commercial variety test. Released lines adapted to Arkansas will be introduced through the foundation seed program to seedsmen.

RESULTS AND DISCUSSION:

Results from this year's research are found on the following pages. The information is divided into three basic sections: 1) New and future releases, 2) Yield nurseries and 3) Early generations.

1) NEW AND FUTURE RELEASES:

Recent releases continue to perform well. Average yields for the past three years in the Arkansas Variety Test (40 total tests) show Pat at 74.0 bu/A, Sabbe at 73.8 bu/A, and AR839 at 73.9 bu/A as compared to Coker 9663 at 72.3 bu/A. All available foundation seed of Pat and Sabbe were sold this year. Certified seed sales of both have been good. Cullum Seed has increased AR839 this past season. Sabbe has been the best line in the soft-wheat growing region of Kansas and Kansas Foundation Seed is now buying seed. We are exploring royalty arrangements.

This summer, the line AR910-9-1 was licensed through an agreement with Delta King Seed Company which will have exclusive rights to market the variety in Arkansas. This line will be called AR 910 and will be labeled as a Delta King variety. AR910 is an early maturing variety and has very good resistance to stripe rust. We will be increasing seed of AR93027-3-2 this year. It was in the Uniform Regional Trial and the Arkansas State Variety Test in 2004-05. It will also be in the official Wisconsin State Variety trial in 2004-05. The Wisconsin Foundation Seed organization requested it be evaluated there because its performance in the Uniform Test in 2003-04.

2) YIELD NURSERIES

The most advanced experimental lines were planted in the Elite Wheat Lines (EWL) nursery at Keiser, Stuttgart, and Marianna. As previously mentioned all the tests at Keiser were not harvested for yield due to inadequate stands. The average of the experimental lines over all locations is presented in Table 1. Yields were high and several experimental lines had higher yields averaged across locations than that of the standard check variety, NK Coker 9663. AR93027-3-2 was entered in the Eastern Regional trials and the variety test. This line which was derived from the cross Pioneer 2571 x Coker 9024 is the first line from our program which has resistance to Hessian Fly biotype B and E. According to Gene Milus' test, it also has a high level of resistance to tan spot.

The Advanced Wheat Strains nursery was planted at Keiser, Stuttgart, Marianna, and Baton Rouge, LA. The test at Keiser was not harvested due to poor stands and the test at Baton Rouge could not be harvested due to constant rainfall associated with the hurricanes. Results are given for the two Arkansas locations in Table 2. There were several experimental lines that appeared promising. These lines were advanced to the Elite test for further testing in 2004-05.

The Wheat Observation Yield nursery was planted at Stuttgart and Keiser. The yield results from Stuttgart is given in Table 4. Also included are data (heading and leaf rust reaction) from the Keiser test as well as stripe rust reaction from a screening test by Dr. Milus at Fayetteville. This represents the first yield data from lines selected from F_6 head rows in 2002-03. Several experimental lines that appear promising were advanced to the Advanced Wheat Strains test for further testing in 2004-05.

To enhance disease resistant to Fusarium Head Blight (Scab) a special nursery is conducted to screen experimental lines for agronomic traits as well as scab resistance. The results of this nursery are presented in Table 4. Several lines possess the same level of resistance as the resistant check 'Ernie' but have yields similar to 'Pat'.

Table 1. Performance of breeding lines and checks in the Elite Wheat Test in 2004 across 2 locations (Stuttgart and Marianna).

Entry	Yield	Test weight	Lodge	Plant ht	Heading date	Maturity date
	bu/A	lb/bu	%	in.		
DIXIE 900	98.8	58.2	2	42	415	521
ARTX94-34-3	95.2	57.1	12	37	414	515
DELTA KING 9410	93.9	57.2	5	42	415	514
AR910-9-1	93.5	56.5	2	40	411	514
ARLA85411	93.0	58.7	10	37	412	513
AGS 2000	93.0	58.0	6	38	409	515
ARTX96-1-5	91.7	58.9	3	36	414	515
AR93027-5-1	90.6	56.7	0	37	415	.
ARTX96-4-3	89.9	57.1	22	39	414	514
AR93035-4-1	89.3	57.6	0	41	420	520
ARTX02D6443	89.1	54.7	4	38	411	516
ARTX02D5544	89.0	57.4	0	35	413	518
COKER 9663	88.9	58.5	23	44	412	520
AR95049-3-1	88.8	58.1	12	42	413	519
ARTX96-35-1	88.5	59.6	6	37	409	517
ARGE97-3005-17	88.4	57.4	2	37	410	514
AR95047-6-1	88.2	59.2	7	45	411	516
AR93027-3-2	88.2	55.9	1	39	414	515
SABBE	88.0	55.9	1	40	421	.
AR839-25-8-2	87.8	57.4	0	47	414	517
ARTX01D3160	87.8	57.0	4	40	410	514
AR850-1-1	87.1	57.7	0	42	420	520
PAT	86.5	57.1	0	42	421	.
AR95047-8-1	86.0	59.3	9	44	412	518
AR93035-4-2	84.8	57.6	4	38	418	519
ARGE97-4058-4-2	84.4	59.0	9	33	414	518
ARTX96-43-1	83.5	60.4	0	38	413	516
ARTX02D5270	83.3	57.2	9	42	413	516
AR95049-4-1	82.9	58.4	11	45	412	519
AR96074-32	82.2	59.7	1	39	417	520
AR93005-6-4	81.1	57.5	1	41	421	.
ARTX96-26	81.0	54.9	20	40	414	521
ARGE97-1017-4-1	79.7	58.8	2	38	415	521
ARGE97-0027-3-3	79.7	59.4	13	42	407	516
AR93005-6-5	79.6	57.9	1	38	415	.
AR94047-5-1	79.3	48.3	1	39	420	.
AR94112-7-1	79.3	53.7	4	36	417	517
ARGE97-0030-3-3	76.9	59.2	1	45	413	518
AR93005-6-1	75.3	56.4	1	37	417	.
AR95125-1-1	72.7	55.9	41	41	413	517
AR95108-5-2	71.4	60.5	9	40	416	519
AR95108-5-3	68.7	60.2	27	41	415	520

Table 2. Performance of breeding lines and checks in the Advanced Wheat Lines Test in 2004 across 2 locations (Stuttgart and Marianna).

Entry	Yield	Test weight	Lodge	Plant ht	Heading date	Mature date	Leaf rust
	bu/A	lb/bu	%	in.			%
AR96131-10-1	99.7	57.2	8	38	408	513	10
AR96077-7-2	97.7	55.8	5	33	414	515	20
AGS2000	97.2	58.0	5	39	412	516	0
AR96052-4-2	95.3	55.4	18	37	412	516	.
AR96024-4-1	94.4	58.0	8	37	416	519	0
AR96141-4-1	92.5	56.3	7	41	415	515	25
AR96024-4-2	92.4	57.8	5	36	416	513	0
AR96052-4-3	92.0	55.5	15	37	413	514	25
COKER9663	91.9	58.1	13	42	415	515	10
AR96142-2-1	91.3	56.4	5	39	415	515	60
SABBE	90.8	55.1	1	40	420	517	40
AR96077-7-3	90.5	55.2	5	34	415	515	5
AR96031-1-1	90.3	55.9	0	33	414	516	2
AR96158-2-1	88.6	56.5	10	35	418	517	5
AR96062-6-1	88.3	60.0	10	39	413	517	50
AR96077-10-1	88.2	55.1	9	37	417	513	25
AR96150-2-1	88.0	56.6	32	33	406	513	15
AR96141-5-1	87.8	57.3	3	43	415	515	40
AR96135-7-2	87.8	53.3	11	39	415	514	25
AR96001-2-2	87.1	54.4	0	37	416	516	1
AR96136-5-1	87.1	55.5	8	38	413	517	10
AR96161-4-1	87.0	52.7	3	38	415	519	10
PAT	86.5	56.5	0	42	421	520	1
AR96077-2-1	86.0	56.1	19	40	408	513	50
AR96154-5-1	85.9	55.4	17	37	330	513	50
AR96003-5-1	85.7	55.8	8	40	412	516	2
AR96008-4-3	84.7	55.1	14	41	409	519	25
AR96077-3-1	84.5	56.6	4	37	414	515	20
AR96086-2-1	84.3	54.7	19	38	410	516	40
AR96143-1-1	84.2	53.0	10	33	415	516	40
AR96001-2-1	83.9	55.7	3	38	413	514	5
AR96154-2-1	83.7	55.9	16	36	406	517	15
AR96004-1-1	83.4	57.1	3	40	415	514	1
AR96081-7-2	82.4	55.9	37	36	416	515	1
AR96015-1-1	82.2	56.7	13	40	416	520	1
AR96135-4-1	81.7	54.2	7	40	417	514	50
AR96049-2-1	81.1	55.0	1	34	419	518	10
AR96143-8-1	80.8	53.8	5	40	413	516	1
AR96146-2-2	80.7	52.3	8	37	415	517	1
AR96138-7-1	80.6	53.3	13	39	414	520	20
AR96015-1-2	80.5	56.6	8	41	417	.	2
AR96082-3-2	79.0	56.7	15	39	416	519	10
AR96161-4-2	78.9	52.4	0	38	416	521	2
AR96135-7-1	78.6	55.0	9	41	415	515	35
AR96136-8-1	78.6	52.4	17	37	410	516	1
AR96081-6-1	78.2	58.1	17	38	420	521	0
AR96138-1-1	77.6	54.2	12	36	416	518	20
AR96081-7-1	77.1	56.2	37	35	415	517	0
AR96008-4-1	77.0	52.4	11	37	409	516	70
AR96161-5-2	76.9	53.6	10	43	414	518	0
AR96146-3-1	76.9	52.8	21	34	407	514	50

AR96056-5-2	76.6	56.2	7	37	415	517	25
AR96163-3-1	74.9	53.1	23	39	404	512	10
AR96163-1-1	73.6	53.9	1	43	413	517	0
AR96007-4-2	73.4	55.5	7	43	416	514	2
AR96146-2-3	73.2	52.4	25	39	416	516	2
AR96140-8-1	73.0	56.6	18	36	413	521	5
AR96163-4-1	71.3	55.0	21	37	410	511	1
AR96015-7-1	71.2	56.3	21	40	410	519	75
AR96146-2-1	70.7	50.0	13	38	416	517	1

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
1	SABBE	99.0	56.6	0	39	417	421	519	50	2
2	AR93021-1-2-1	68.0	58.1	50	38	416	422	519	2	2
3	AR93021-1-2-2	87.2	59.9	50	37	418	422	518	0	0
4	AR93021-1-2-3	91.3	59.9	30	38	418	422	518	2	0
5	AR93021-1-2-4	93.3	59.2	20	36	418	423	519	2	0
6	AR93021-1-2-5	75.9	58.9	50	37	418	423	519	20	0
7	AR93021-1-4-1	76.3	58.4	10	36	418	423	519	20	2
8	AR97001-8-1	82.4	58.2	70	34	408	416	514	2	7
9	AR97001-8-2	79.0	56.7	90	34	408	417	514	2	0
10	AR97003-1-1	75.9	59.0	90	37	419	423	517	10	2
11	PAT	89.5	65.8	0	40	421	423	519	15	0
12	AR97008-1-1	66.8	57.2	80	39	419	419	520	2	0
13	AR97008-1-2	60.6	58.2	80	38	419	413	520	2	2
14	AR97008-4-1	62.6	59.6	90	38	418	418	517	5	0
15	AR97008-6-1	71.1	58.7	50	42	419	419	.	15	0
16	AR97008-6-2	64.6	57.4	60	41	421	423	.	2	0
17	AR97008-6-3	58.8	53.7	40	41	421	429	.	40	0
18	AR97008-7-1	64.9	58.5	40	41	422	429	.	0	0
19	AR97008-7-2	65.2	57.9	50	44	421	424	.	1	0
20	AR97008-8-1	70.1	57.7	20	40	421	424	.	0	2
21	AR97008-8-2	69.6	59.0	30	42	421	424	.	1	2
22	AR910	94.4	58.5	40	38	410	415	515	4	0
23	AR97008-8-3	87.2	59.6	0	44	420	429	.	0	0
24	AR97008-8-4	73.7	58.9	20	46	421	429	.	0	0
25	AR97008-8-5	77.2	59.1	10	46	422	428	.	2	0
26	AR97008-8-6	83.9	59.3	0	45	423	428	.	0	0
27	AR97008-8-7	79.3	58.9	10	44	423	429	.	0	.
28	AR97025-3-1	78.5	57.7	40	44	422	425	.	60	.
29	AR97025-9-1	71.5	58.9	70	41	420	423	.	40	0
30	AR97026-7-1	90.0	56.5	70	36	410	416	514	5	0
31	AR97026-8-1	101.1	59.1	50	40	413	419	513	10	30
32	AR97026-9-1	92.7	58.6	20	38	414	419	516	5	7
33	SABBE	94.8	56.7	0	38	420	421	.	75	
34	AR97026-9-2	97.2	59.5	40	39	416	421	517	60	
35	AR97026-11-1	91.6	54.1	70	37	415	418	514	40	0
36	AR97026-11-2	91.4	53.6	90	36	415	418	515	15	0
37	AR97027-2-1	79.5	59.0	80	38	414	419	515	30	2
38	AR97027-2-2	89.1	58.8	90	40	413	418	515	25	2
39	AR97031-1-1	92.7	56.5	90	37	415	419	.	10	.
40	AR97031-1-2	107.2	58.7	20	41	415	419	515	15	0

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
41	AR97031-8-1	103.2	57.6	50	38	414	418	514	15	0
42	AR97031-8-2	96.7	57.9	80	38	414	416	514	7	0
43	AR97036-1-1	82.1	54.0	20	42	421	425	.	10	2
44	PAT	114.7	57.7	10	39	420	424	520	25	
45	AR97036-1-2	87.7	57.1	0	41	421	422	.	0	7
46	AR97036-1-3	85.6	58.3	10	41	419	420	520	1	7
47	AR97036-3-1	71.4	57.4	70	47	418	421	519	50	2
48	AR97038-2-1	84.0	58.2	90	35	419	419	515	50	2
49	AR97038-10-1	86.9	59.7	10	40	417	418	514	30	0
50	AR97038-10-2	92.3	59.0	30	40	417	418	514	20	2
51	AR97040-2-1	85.1	56.5	0	39	416	419	517	10	2
52	AR97040-10-1	72.3	56.1	0	40	421	422	.	70	.
53	AR97044-3-1	91.3	60.5	0	41	419	420	517	5	0
54	AR97044-3-2	80.6	60.0	10	42	419	420	517	2	0
55	AR910	97.9	58.5	0	43	415	418	516	2	
56	AR97044-10-1	109.9	59.1	0	41	414	419	516	5	0
57	AR97044-10-2	107.0	58.4	0	41	417	418	517	10	2
58	AR97044-10-3	104.6	58.7	0	42	416	419	516	10	0
59	AR97044-12-1	99.0	59.5	0	44	416	418	516	15	0
60	AR97044-12-2	96.5	60.3	0	46	416	418	517	15	0
61	AR97044-12-3	94.4	59.3	0	41	415	419	517	10	2
62	AR97051-2-1	74.6	59.3	80	46	420	423	521	0	2
63	AR97051-2-2	79.9	59.0	90	43	420	424	521	0	0
64	AR97064-1-1	65.7	57.2	100	39	412	417	519	0	2
65	AR97064-1-2	86.2	56.5	90	40	412	416	519	2	.
66	SABBE	89.8	56.9	0	40	421	422	.	75	
67	AR97064-2-1	71.9	58.9	60	44	416	421	518	10	0
68	AR97064-2-2	51.6	57.7	80	43	416	422	517	10	0
69	AR97064-5-1	76.0	58.1	60	46	415	420	517	0	0
70	AR97064-5-2	60.4	57.6	90	43	415	419	517	5	.
71	AR97064-6-1	62.4	59.4	10	46	414	419	518	15	0
72	AR97064-7-1	70.7	57.9	60	43	415	420	518	2	0
73	AR97064-7-2	69.4	57.7	50	46	417	420	514	1	0
74	AR97064-8-1	74.0	57.6	40	41	415	420	515	1	0
75	AR97064-8-2	71.6	56.8	30	43	416	421	515	2	0
76	AR97064-9-1	79.2	57.9	40	43	415	419	516	5	0
77	PAT	84.3	58.3	0	42	422	425	.		10
78	AR97064-9-2	81.1	58.5	80	42	417	418	519	1	0
79	AR97064-10-1	78.5	58.3	60	43	417	419	519	2	7
80	AR97064-11-1	66.9	55.8	70	40	419	419	520	4	0

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Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
81	AR97064-12-1	62.0	54.8	80	40	416	420	519	20	0
82	AR97064-15-1	75.8	58.2	80	43	415	419	519	1	2
83	AR97067-11-1	81.1	59.6	0	39	417	420	520	2	.
84	AR97067-14-1	88.2	57.4	0	36	417	418	517	10	0
85	AR97068-1-1	86.7	57.1	90	40	417	418	519	10	0
86	AR97068-1-2	77.7	56.4	90	37	418	420	519	1	2
87	AR97068-2-1	78.8	56.0	70	38	419	422	520	0	2
88	AR910	97.9	58.2	0	41	413	418	514	10	
89	AR97068-3-1	96.7	58.7	0	40	415	420	516	50	0
90	AR97068-5-1	98.0	57.9	0	36	421	422	518	2	0
91	AR97068-5-2	94.4	57.9	0	41	420	421	518	1	.
92	AR97068-6-1	92.1	56.7	0	40	421	420	518	0	0
93	AR97068-8-1	82.4	58.3	20	41	423	423	520	0	0
94	AR97073-1-1	83.7	59.3	80	42	408	416	517	5	.
95	AR97073-1-2	86.3	58.0	90	45	408	416	517	10	.
96	AR97073-1-3	88.1	58.9	90	42	409	422	518	40	.
97	AR97073-2-1	75.7	58.2	90	44	411	419	516	2	.
98	AR97073-5-1	95.0	58.7	90	42	412	421	516	50	.
99	SABBE	106.5	56.6	0	38	421	421	.	50	.
100	AR97073-11-1	77.2	56.5	50	41	417	423	519	50	.
101	AR97083-1-1	98.4	59.9	0	37	420	420	518	1	2
102	AR97083-1-2	93.9	59.4	10	39	419	420	518	2	15
103	AR97083-5-1	87.0	60.1	80	36	420	420	517	1	15
104	AR97083-14-1	82.4	59.2	90	38	413	418	519	5	7
105	AR97083-14-2	86.1	58.1	90	37	414	418	519	1	7
106	AR97086-1-1	84.9	56.5	70	37	412	419	513	10	0
107	AR97086-2-1	91.3	59.8	20	46	416	419	517	40	0
108	AR97086-2-2	85.0	59.7	40	44	415	418	518	50	0
109	AR97086-3-1	82.8	58.1	60	42	416	419	521	35	0
110	PAT	110.4	58.9	0	43	421	424	519	2	.
111	AR97086-4-1	88.0	59.7	60	44	416	422	518	40	7
112	AR97098-2-1	72.5	58.2	70	42	417	420	519	1	7
113	AR97098-3-1	59.7	53.7	20	38	423	427	.	75	7
114	AR97098-6-1	81.2	53.5	0	43	423	425	.	0	30
115	AR97098-6-2	74.3	53.7	0	44	424	430	.	0	15
116	AR97100-1-1	89.8	58.7	30	42	416	420	514	10	7
117	AR97100-3-1	100.3	58.4	50	41	416	420	514	20	2
118	AR97100-4-1	103.6	58.9	60	40	416	420	514	10	7
119	AR97106-2-1	98.0	60.0	20	39	418	419	517	3	7
120	AR97106-7-1	83.6	60.0	40	41	417	419	518	2	15

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
121	AR910	98.5	58.7	0	42	416	419	517	5	.
122	AR97106-8-1	94.6	60.1	0	37	415	420	.	30	15
123	AR97106-8-2	91.3	59.2	20	38	415	421	.	50	15
124	AR97109-1-1	88.0	57.8	60	43	412	419	514	60	0
125	AR97109-1-2	83.1	57.4	90	43	412	416	515	30	0
126	AR97109-2-1	87.5	56.7	80	44	415	418	515	10	0
127	AR97109-3-1	88.8	58.6	80	44	415	419	517	10	0
128	AR97109-3-2	91.0	58.4	70	45	414	419	517	10	0
129	AR97109-5-1	89.1	58.4	0	44	410	418	515	10	0
130	AR97109-9-1	100.9	58.5	0	43	414	418	518	15	2
131	AR97109-9-2	100.3	57.7	0	43	415	418	518	40	0
132	SABBE	96.1	57.2	0	38	420	421	520	60	.
133	AR97109-9-3	114.0	58.1	0	42	414	421	515	15	2
134	AR97110-3-1	85.8	60.8	90	44	415	422	515	25	15
135	AR97110-5-1	88.6	58.9	90	40	414	420	514	30	0
136	AR97111-1-1	89.1	53.9	0	40	423	423	.	30	.
137	AR97111-1-2	83.6	54.6	0	42	421	424	.	30	2
138	AR97112-2-1	86.5	58.6	40	43	417	421	516	5	0
139	AR97112-8-1	88.3	59.6	90	42	416	419	516	2	7
140	AR97112-9-1	93.4	60.1	90	42	416	419	515	0	7
141	AR97112-9-2	93.2	60.1	80	44	415	420	515	2	7
142	AR97113-3-1	88.5	58.4	50	44	418	422	.	5	0
143	PAT	100.9	59.0	0	42	421	424	521	10	.
144	AR97113-3-2	91.1	59.1	0	46	420	420	518	25	0
145	AR97113-4-1	82.3	58.1	60	44	414	419	520	15	0
146	AR97113-5-1	88.1	53.1	80	43	415	419	519	40	0
147	AR97113-7-1	88.4	57.0	0	39	419	419	520	10	0
148	AR97113-10-1	91.7	57.6	80	44	415	418	519	5	0
149	AR97113-10-2	86.1	57.0	90	45	415	417	521	7	0
150	AR97113-10-3	97.8	59.0	70	45	414	417	520	5	0
151	AR97113-12-1	96.0	58.4	70	45	415	418	519	5	7
152	AR97113-12-2	92.4	57.9	60	46	415	419	520	5	2
153	AR97113-13-1	97.0	58.4	60	46	416	418	520	5	0
154	AR910	104.5	58.4	0	42	416	418	514	5	.
155	AR97116-1-1	67.9	59.3	20	43	420	423	518	2	2
156	AR97116-3-1	70.0	58.7	0	40	414	421	516	2	2
157	AR97116-3-2	69.4	57.4	0	39	417	423	516	2	0
158	AR97116-3-3	75.1	57.8	0	38	415	420	516	2	0
159	AR97116-3-4	68.6	58.9	0	40	415	420	515	1	0
160	AR97117-7-1	58.2	59.1	80	43	416	422	519	1	7

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
161	AR97117-11-1	58.3	60.1	90	44	414	420	521	2	15
162	AR97117-11-2	67.9	60.7	60	42	416	421	518	0	7
163	AR97119-2-1	72.6	60.1	90	44	415	421	518	10	0
164	AR97119-4-1	70.3	60.5	80	42	418	420	520	5	2
165	SABBE	89.2	57.4	0	40	421	423	.	45	.
166	AR97119-6-1	78.8	59.3	0	39	418	420	519	40	15
167	AR97120-2-1	73.5	57.2	0	42	421	422	.	2	2
168	AR97120-4-1	82.4	60.6	0	42	419	423	.	1	0
169	AR97120-5-1	84.1	60.3	10	44	420	421	.	2	0
170	AR97120-6-1	92.7	59.7	0	42	420	422	520	5	0
171	AR97120-8-1	73.4	60.4	50	41	423	422	.	2	2
172	AR97127-4-1	81.1	59.8	0	42	417	420	517	10	0
173	AR97127-5-1	53.5	58.1	70	43	421	422	517	45	.
174	AR97127-6-1	71.7	58.7	90	43	421	422	520	2	0
175	AR97127-8-1	75.1	57.7	90	39	420	421	520	1	7
176	PAT	91.6	58.4	0	42	423	425	519	10	.
177	AR97127-9-1	89.6	57.9	20	42	414	422	514	2	0
178	AR97128-1-1	93.1	58.6	30	42	422	423	515	0	0
179	AR97128-1-2	87.1	58.7	70	43	422	424	519	0	7
180	AR97128-2-1	93.3	57.2	30	41	423	424	519	2	15
181	AR97128-2-2	92.1	57.4	20	40	422	424	519	1	7
182	AR97130-4-1	100.5	59.8	0	42	415	423	518	1	15
183	AR97131-1-1	82.7	58.5	0	43	521	422	518	30	.
184	AR97131-1-2	84.6	57.8	0	43	422	429	519	5	7
185	AR97131-1-3	88.4	58.1	0	42	422	428	520	0	.
186	AR97136-2-1	77.9	57.4	80	40	421	423	520	5	0
187	AR910	111.5	58.4	0	42	415	421	516	5	.
188	AR97136-2-2	89.3	56.9	80	39	417	421	517	2	0
189	AR97136-2-3	86.7	57.9	90	42	421	423	518	5	2
190	AR97136-4-1	95.4	57.0	80	40	421	422	519	5	15
191	AR97136-4-2	92.8	56.5	60	42	421	420	519	15	15
192	AR97136-7-1	97.4	57.7	90	42	416	418	517	10	0
193	AR97136-7-2	80.5	57.6	80	41	416	418	516	10	0
194	AR97136-7-3	94.6	58.1	70	42	415	418	516	10	0
195	AR97136-8-1	102.5	56.7	70	43	415	418	514	20	0
196	AR97136-9-1	109.1	58.1	90	39	414	418	516	5	0
197	AR97136-9-2	107.9	57.7	90	38	414	418	516	2	0
198	SABBE	99.6	57.0	0	38	421	421	518	40	0
199	AR97137-1-1	87.9	58.5	0	38	419	423	518	2	.
200	AR97137-1-2	81.5	59.1	10	39	418	422	518	10	0

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
201	AR97137-2-1	75.0	60.6	0	39	415	421	514	2	0
202	AR97137-2-2	84.5	60.7	0	41	414	421	514	2	0
203	AR97137-2-3	81.3	60.5	0	40	415	421	515	5	0
204	AR97137-2-4	79.9	60.3	0	41	415	420	514	5	0
205	AR97137-2-5	83.0	60.8	0	41	416	419	514	5	0
206	AR97137-9-1	86.4	58.9	60	36	420	422	520	10	0
207	AR97137-9-2	82.3	58.6	10	38	420	423	519	10	0
208	AR97137-11-1	82.2	58.9	10	38	421	423	520	10	0
209	PAT	86.5	58.1	0	41	423	426	519	2	.
210	AR97138-11-2	85.1	57.7	10	40	422	422	520	2	0
211	AR97139-1-1	72.3	58.4	30	40	418	419	516	2	0
212	AR97139-1-2	81.3	58.6	50	40	418	419	515	1	15
213	AR97139-3-1	77.2	57.8	20	41	418	418	516	0	2
214	AR97139-3-2	77.3	56.2	0	41	417	418	514	1	0
215	AR97139-3-3	70.1	57.3	30	39	417	420	517	1	0
216	AR97139-3-4	59.5	58.1	40	40	418	420	516	0	0
217	AR97139-5-1	94.6	58.9	50	41	418	419	516	0	0
218	AR97139-7-1	84.9	58.1	40	39	419	420	518	0	15
219	AR97139-9-1	100.2	58.6	20	38	416	418	515	2	15
220	AR910	93.5	58.4	0	42	415	421	515	5	.
221	AR97139-9-2	119.4	57.9	10	39	416	419	514	0	7
222	AR97139-10-1	112.1	60.3	0	39	418	420	515	40	0
223	AR97139-11-1	103.1	59.2	10	40	415	418	517	1	2
224	AR97139-11-2	92.2	59.3	20	39	415	418	516	2	0
225	AR97139-14-1	105.3	59.3	20	40	415	418	513	2	7
226	AR97139-15-1	112.5	58.4	10	40	414	419	513	5	0
227	AR97139-15-2	110.7	58.0	30	39	414	419	515	2	7
228	AR97139-18-1	80.7	58.3	20	40	417	422	516	10	0
229	AR97139-18-2	96.5	57.5	10	39	418	422	517	2	0
230	AR97139-19-1	92.6	58.5	30	40	415	419	517	35	0
231	SABBE	106.5	57.0	0	39	423	422	521	25	.
232	AR97139-19-2	107.4	58.2	50	38	415	421	515	5	0
233	AR97139-20-1	94.2	57.8	50	38	416	418	515	2	0
234	AR97139-20-2	94.6	57.5	60	39	416	419	516	2	0
235	AR97141-1-1	76.5	56.5	30	48	421	427	.	20	2
236	AR97141-1-2	70.5	55.6	70	49	422	422	.	30	.
237	AR97141-2-1	52.0	56.0	80	49	422	425	.	2	0
238	AR97141-2-2	80.0	56.5	60	48	422	426	.	0	0
239	AR97141-4-1	83.8	56.0	30	46	421	428	.	2	0
240	AR97141-4-2	79.5	56.0	20	48	421	427	.	2	0

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
241	AR97141-4-3	77.6	55.5	30	48	417	429	431	1	0
242	PAT	107.7	58.4	0	41	421	425	518	15	.
243	AR97143-3-1	86.2	58.9	30	38	414	418	517	1	15
244	AR97143-4-1	74.3	57.1	60	39	414	417	515	20	0
245	AR97143-6-1	87.0	58.9	0	39	416	422	519	25	7
246	AR97143-6-2	88.8	59.3	0	38	416	420	519	2	15
247	AR97143-7-1	89.2	57.2	0	42	414	420	514	2	0
248	AR97143-7-2	96.2	58.1	0	41	415	422	514	5	15
249	AR97144-1-1	72.5	59.4	80	38	415	418	514	2	15
250	AR97144-1-2	77.8	59.8	90	39	414	419	514	2	2
251	AR97144-2-1	87.9	60.4	0	40	415	419	515	2	7
252	AR97144-3-1	83.9	59.7	70	40	416	418	515	2	30
253	AR910	101.4	58.4	0	40	412	422	515	2	.
254	AR97144-4-1	61.5	56.8	0	39	420	421	.	3	50
255	AR97144-5-1	95.9	60.5	10	39	414	420	514	2	30
256	AR97149-3-1	86.9	59.1	40	36	414	417	515	2	15
257	AR97149-8-1	95.0	59.8	0	35	415	416	515	5	7
258	AR97149-8-2	86.7	59.3	40	34	415	416	514	2	7
259	AR97149-8-3	90.1	59.7	60	32	414	414	514	5	7
260	AR97149-9-1	93.2	59.6	70	36	415	418	515	.	2
261	AR97149-9-2	100.8	59.3	60	37	415	418	514	2	15
262	AR97151-1-1	98.5	56.6	0	35	417	422	520	1	50
263	AE97151-1-2	91.6	57.0	10	36	417	421	520	1	50
264	SABBE	96.8	56.8	0	34	421	423	520	40	.
265	AR97152-3-1	95.3	58.2	0	37	421	423	519	2	15
266	AR97152-3-2	86.6	58.0	0	38	420	422	520	2	15
267	AR97154-2-1	98.0	58.8	0	38	420	422	518	5	2
268	AR97154-2-2	87.2	59.1	0	39	422	422	519	10	15
269	AR97157-1-1	89.4	59.0	70	38	418	422	518	20	.
270	AR97157-2-1	73.5	57.8	0	39	420	423	.	2	0
271	AR97157-2-2	81.4	57.4	0	38	421	422	.	1	0
272	AR97168-1-1	90.9	59.9	0	36	417	422	516	1	15
273	AR97168-2-1	80.8	57.7	10	36	416	422	520	1	15
274	AR97168-5-1	92.0	57.4	10	36	420	423	520	0	30
275	PAT	97.0	58.6	0	41	423	424	521	5	.
276	AR97168-5-2	88.3	57.1	20	35	422	424	521	2	30
277	AR97168-6-1	78.0	34.3	40	36	421	423	.	1	30
278	AR97168-6-2	79.4	56.2	40	36	421	421	.	1	30
279	AR97168-7-1	91.4	56.7	0	38	422	423	.	0	15
280	AR97168-7-2	96.8	57.4	30	38	422	424	.	1	7

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
281	AR97170-1-1	103.1	59.8	0	40	422	423	.	1	2
282	AR97170-1-2	93.0	60.3	30	40	423	423	.	2	0
283	AR97170-2-1	108.8	61.6	0	40	423	424	.	5	7
284	AR97170-5-1	19.0	51.2	0	40	419	423	.	10	0
285	AR97170-7-1	96.1	59.9	80	41	420	422	.	5	2
286	AR910	118.5	58.9	0	40	414	420	515	5	.
287	AR97171-4-1	90.5	60.8	0	42	415	421	515	20	7
288	AR97172-1-1	77.6	59.9	50	38	422	422	.	5	0
289	AR97172-6-1	71.7	60.1	60	38	423	420	518	2	15
290	AR97172-6-2	77.9	60.6	70	42	422	421	518	5	0
291	AR97172-7-1	86.8	60.1	40	44	420	421	516	5	7
292	AR97173-2-1	86.3	60.2	80	40	416	420	515	2	7
293	AR97174-1-1	68.0	60.2	20	43	418	420	518	2	7
294	AR97174-2-1	74.3	58.6	20	40	419	423	520	5	7
295	AR97176-3-1	96.1	57.7	40	39	421	421	519	15	15
296	AR97176-4-1	89.9	57.0	30	39	419	421	518	5	30
297	SABBE	94.0	57.0	10	40	421	421	.	30	.
298	AR97177-2-1	90.5	60.4	0	40	414	418	514	5	85
299	AR97178-1-1	102.1	59.4	80	37	419	421	521	5	85
300	AR97178-1-2	95.4	58.2	80	37	419	421	518	10	50
301	AR97178-2-2	89.1	59.8	50	38	414	417	517	5	15
302	AR97181-2-1	62.7	59.5	40	35	421	422	521	5	2
303	AR97184-1-1	88.0	58.6	70	41	416	416	521	0	2
304	AR97198-2-1	79.2	55.5	50	42	423	425	.	2	2
305	AR97198-2-2	81.6	56.8	0	45	421	425	.	10	7
306	AR97198-2-3	89.4	57.4	0	44	422	426	.	5	7
307	AR97211-1-1	90.9	56.6	0	43	421	427	.	2	15
308	PAT	110.1	58.9	0	44	423	425	519	2	.
309	AR97217-1-1	100.8	60.3	0	41	419	422	.	10	2
310	AR97225-4-1	111.8	59.6	30	36	417	423	517	35	.
311	AR97226-1-1	108.4	59.3	0	34	417	417	514	2	15
312	AR97226-1-2	103.0	58.5	0	36	416	419	514	2	30
313	AR97226-6-1	98.9	59.6	0	40	416	417	514	1	15
314	AR97226-6-2	90.5	59.2	10	36	416	417	514	2	15
315	AR97229-4-1	81.2	59.1	20	38	416	422	519	5	30
316	AR97229-4-2	90.0	58.3	40	38	415	421	520	5	15
317	AR97229-4-3	88.5	57.3	0	39	416	420	520	2	15
318	AR97235-4-1	91.3	58.9	30	42	422	425	.	5	15
319	SABBE	91.6	56.7	0	37	423	422	.	45	.
320	AR97237-2-1	73.6	51.3	0	43	422	426	.	1	7

Table 3. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2004 at Stuttgart (also includes data from Keiser and Fayetteville).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date-S	Heading date-K	Mature date	Leaf rust	Stripe rust
		bu/A	lb/bu	%	in.				%	%
321	AR97239-5-1	84.7	56.5	80	38	418	421	.	1	0
322	AR97240-3-1	84.4	55.6	100	37	415	419	520	0	7
323	AR97240-4-1	93.7	56.8	90	41	414	419	517	1	2
324	AR97243-1-1	88.4	55.5	80	38	414	418	518	2	30
325	AR97243-2-1	99.9	59.1	50	37	415	417	516	1	30
326	AR97243-4-1	92.6	57.0	40	38	414	417	517	1	15
327	AR97243-4-2	103.2	57.3	60	35	414	418	517	1	15
328	AR97243-6-1	103.2	57.2	100	36	414	416	516	1	15
329	AR97243-6-2	93.9	58.0	100	35	415	417	516	0	30
330	PAT	109.0	58.6	0	40	423	426	518	5	.
331	AR97244-2-1	86.4	58.7	0	37	417	421	518	2	30
332	AR97244-4-1	96.8	59.1	0	37	416	421	516	0	30
333	AR97244-5-1	89.9	60.5	0	37	416	418	519	1	50
334	AR97244-7-1	90.2	58.6	0	38	416	421	.	0	15
335	AR97244-7-2	88.2	58.7	0	34	417	421	.	0	7
336	AR97245-5-1	76.3	58.4	10	41	415	419	516	1	30
337	AR97253-2-1	69.5	60.0	80	44	419	422	520	2	0

Table 4. Performance of lines in Scab Nursery at Stuttgart in2004.

Entry Name	Yield	Test wt	Ldg	FHB[1]	Diseased leaves[2]
	bu/A	lb/bu	%	%	%
AR97124-4-1	87.3	59.1	25	26	35
AR97124-4-2	80.6	59.7	5	30	40
AR97002-10-1	76.3	58.0	25	40	45
AR97007-8-1	74.5	56.6	5	30	68
AR93095-4-1	74.2	57.4	10	31	55
AR97070-7-1	73.2	58.4	35	45	40
AR97007-12-1	72.9	56.3	0	30	60
AR97124-4-3	72.2	59.3	5	30	45
AR93035-4-1	72.0	57.8	10	26	58
AR97007-7-2	71.9	57.1	5	45	60
Pat	71.4	58.3	0	42	55
AR97078-2-1	70.7	60.5	0	40	74
AR97007-16-1	70.7	56.0	5	40	76
AR97048-1-1	69.9	58.6	15	26	78
AR97002-2-1	69.7	58.6	15	22	45
AR922-5-1	69.5	58.4	5	30	89
AR97048-2-1	68.9	58.4	25	31	71
AR97070-8-1	68.3	59.4	30	35	50
AR97079-9-1	68.1	59.4	50	55	94
AR97007-8-2	67.8	56.6	5	35	65
AR97048-8-1	67.6	58.1	10	30	55
AR93108-3-2	67.5	58.7	5	35	83
AR93035-4-2	67.5	59.1	5	26	45
AR97007-8-3	67.5	56.7	5	45	74
AR97048-4-1	67.3	59.1	15	26	69
AR97002-10-2	67.1	58.7	0	35	35
AR97079-7-1	66.9	60.8	20	35	94
AR910	66.4	59.0	3	28	52
AR97002-3-2	66.2	56.9	30	40	55
Sabbe	66.1	57.1	5	48	37
AR97048-7-2	66.0	56.7	10	30	50
AR97147-4-3	65.9	61.0	5	30	55
AR97007-4-1	65.2	57.9	10	30	78
AR97079-6-1	64.4	60.4	5	22	45
AR97007-7-1	64.2	56.4	5	30	78
AR97002-3-3	63.4	57.0	30	35	45
AR97147-4-1	63.3	58.5	5	30	55
AR97147-4-2	63.2	59.4	10	30	50
AR97124-7-1	62.8	58.0	5	30	45
AR97002-2-2	62.8	58.0	15	22	55
AR93019-2-1	62.3	61.3	5	30	80
AR97048-11-1	60.7	57.9	20	30	50
AR97048-7-1	60.2	57.7	5	22	60
AR97063-6-1	58.7	57.7	5	30	60

Table 4. Performance of lines in Scab Nursery at Stuttgart in2004.

Entry Name	Yield	Test wt	Ldg	FHB[1]	Diseased leaves[2]
	bu/A	lb/bu	%	%	%
AR97133-4-2	58.5	59.3	5	30	55
AR97048-9-1	58.4	57.9	15	30	45
Ernie	57.4	57.9	5	45	50
AR97070-11-2	57.2	61.7	15	30	50
AR97048-6-1	56.9	57.9	5	26	74
AR97048-5-1	56.9	55.9	5	35	55
AR97147-2-1	56.9	56.2	0	35	60
AR97048-11-2	56.8	57.0	20	30	65
AR97002-3-1	56.7	59.0	25	40	69
AR97147-5-1	55.0	57.3	5	36	35
AR97070-9-1	54.8	60.3	20	30	45
AR97070-14-1	54.3	59.3	25	22	30
AR97070-14-2	54.1	58.4	30	26	40
AR97072-2-1	53.5	60.8	25	22	35
AR97048-11-3	53.3	57.7	15	35	60
AR97135-4-1	52.9	57.2	0	7	35
AR97070-11-1	52.2	60.3	15	30	45
AR97142-2-1	50.4	56.2	0	16	40
AR97007-12-2	49.9	48.2	5	16	45
AR97133-4-1	49.8	59.1	10	30	50
AR97070-12-1	49.4	59.6	20	30	45
AR857-1-2	49.3	58.8	0	30	83
AR97134-1-1	49.0	60.3	5	30	55
AR97079-4-1	48.9	58.4	5	30	69
AR857-1-1	42.4	57.3	5	35	69

Ldg = Lodging

[1]FHB ratings were from an inoculated test at Kibler, AR.

[1]Plots at Kibler, AR were rated for % diseased leaf tissue. Disease tissue was primarily due to stripe rust infection, followed by Septoria tritici blotch and some leaf rust

3) EARLY GENERATIONS

During the winter the greenhouse crossing program to produce future lines was continued. There were 109 successful crosses in four efforts: 1) standard variety development, 2) scab-resistant varieties, 3) imidazolinone herbicide resistant varieties and, 4) specialty types (white and waxy wheats. The resulting offspring of last year's crosses (250 F_1) were grown in the greenhouse over the winter to increase seed. The next three generations (F_2, F_3, and F_4) were grown as bulk populations in the field at Stuttgart. This year there were 159 F_2 populations, 194 F_3 populations and 497 F_4 populations produced. Individual plants were selected from the F_6 generation at Fayetteville to produce experimental lines which will be planted at Stuttgart and Keiser this fall to begin yield testing.

Table 5. List of crosses made in the greenhouse during the winter of 2004.

AR800-1-3-1/AR908-8-2	DK 9410/ARGE 97-1042-4-5
AR800-1-3-1/AR93005-6-5	DK 9410/COKER 9375
AR800-1-3-1/GF93052E42	DK 9410/DIXIE 900
AR800-1-3-1/PAT	DK 9410/GF93052E42
AR8001-3-1/SABBE	DK 9410/GF93052E42
AR857-1-1/KS00WGRC44	DK 9410/KS00WGRC44
AR908-2-2/AR93005-6-5	DK 9410/KS00WGRC44
AR93005-6-5/COKER 9375	DK 9410/KS00WGRC44
AR93005-6-5/GF931241E16	DK 9410/LA9415D-104-5-2
AR93027-5-1/DIXIE 900	DK 9410/LA9415D-104-5-2
ARGE971033-3-5/AR93005-6-5	DK 9410/SABBE
ARGE971033-3-5/DIXIE 900	DIXIE 900/AR 800-1-3-1
ARGE971033-3-5/DIXIE 900	DIXIE 900/AR93027-5-1
ARGE971033-3-5/GF93052E42	DIXIE 900/COKER 9375
BERETTA/COKER 9375	DIXIE 900/COKER 9375
BERETTA/DK 9410	DIXIE 900/DK 9410
BERETTA/DIXIE 900	DIXIE 900/DK 9410
BERETTA/DIXIE 900	DIXIE 900/DK 9410
BERETTA/LA9415D-104--5-2	DIXIE 900/DK 9410
BERETTA/LA9415D-104--5-2	DIXIE 900/GF93052E42
COKER 9375/AR800-1-3-1	DIXIE 900/GF93052E42
COKER 9375/AR800-1-3-1	DIXIE 900/GF931241E16
COKER 9375/AR800-1-3-1	DIXIE 900/KS00WGRC44
COKER 9375/AR93005-6-5	DIXIE 900/KS00WGRC44
COKER 9375/DK 9410	DIXIE 900/KS00WGRC44
COKER 9375/DIXIE 900	DIXIE 900/LA9415D-104-5-2
COKER 9375/DIXIE 900	DIXIE 900/LA9415D-104-5-2
COKER 9375/GF93052E42	DIXIE 900/SABBE
COKER 9375/GF931241E16	GF93052E42/COKER 9375
COKER 9375/KS00WGRC44	GF93052E42/DIXIE 900
COKER 9375/LA 94150-104-5-2	GF93052E42/DIXIE 900
COKER 9375/LA 94150-104-5-2	GF93052E42/DK 9410

GF93052E42/DK 9410
GF93052E42/DK 9410
GF93052E42/KS00WGRC44
GF93052E42/LA9415D-104-5-2
GF93052E42/SABBE
GF931241E16 / BERETTA
GF931241E16 / LA9415D-104-5-2
GF931241E16 / VAN 98W-170WS
GF931241E16 / VAN 98W-170WS
KS00WGRC44/DK 9410
KS00WGRC44/DK 9410
KS00WGRC44/DIXIE 900
KS00WGRC44/GF93052E42
LA9415D-104-5-2/AR 908-8-2
LA9415D-104-5-2/COKER 9375
LA9415D-104-5-2/DK 9410
LA9415D-104-5-2/DK 9410
LA9415D-104-5-2/DIXIE 900
LA9415D-104-5-2/DIXIE 900
LA9415D-104-5-2/DIXIE 900
LA9415D-104-5-2/KS00WGRC44
LA9415D-104-5-2/SABBE
LA9415D-104-5-2/VAN 98W-170WS
P26R61/BERETTA
P26R61/GF931241E16
P26R61/LA 94150-104-5-2
SABBE/AR857-1-1
SABBE/ARGE97-1033-3-5
SABBE/COKER 9375
SABBE/DK 9410
SABBE/DK 9410
SABBE/DK 9410
SABBE/DK 9410
SABBE/DIXIE900
SABBE/GF93052E42
SABBE/GF93052E42
SABBE/GF931241E16
SABBE/KS00WGRC44
SABBE/KS00WGRC44
SABBE/VAN 98W-170WS
VAN 98W-170 WS/AR 800-1-3-1
VAN 98W-170 WS/AR 908-8-2
VAN 98W-170 WS/AR 93005-6-5
VAN 98W-170 WS/DK 9410
VAN 98W-170 WS/SABBE

CONCLUSIONS:

The breeding project has made strides in a number of areas. Approximately 800 experimental lines were tested throughout the state to determine genetic potential for Arkansas wheat producers. For future testing nearly 20,000 new lines were evaluated in the field. In order to produce new experimental lines, over 1000 genetically segregating populations were grown in the field as well as making over 100 crosses in the greenhouse to produce new populations. Some specific highlights from this year's work:

➜ Certified seed of Pat and Sabbe sold.

➜ AR 910 released through a marketing agreement with Delta King Seed Company.

➜ Breeder seed of AR93027-3-2 increase for possible release in summer 2004.

➜ Three lines advanced to Regional Soft Wheat testing

➜ Breeding lines of herbicide-tolerant wheat for Hoelon-resistant ryegrass.

➜ Four scab resistant lines advanced for regional testing.

➜ Identification of lines resistant to stripe rust.

➜ Work in developing speciality (white and waxy) wheat for Arkansas continued.