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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 839-25-8-2 was licensed through an agreement with Delta King and Armor (Cullum) Seed Companies; both will share the license and market the variety in Arkansas. This line will be called AR 839 and will be labeled as an Armor or 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 (2002-03) went well. All six locations were planted in the optimum planting period, with the exception of Keiser. Keiser was not planted until very late due to wet soil conditions and the resulting stands were so poor all the tests were abandoned. All other locations had excellent stands. During the spring, the project's work consisted primarily of fertilization and herbicide application. In addition to the normal breeding trials, two disease trials were also planted, Scab Observation and Rust Observation nurseries 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) 8 experimental lines had higher yields averaged across all locations than that of the standard check variety, NK Coker 9663.

During the winter the crossing program to produce future lines was expanded. There were 250 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:

Both Pat and Sabbe have continued to perform well. Sabbe had the highest recorded yield of any of variety at any location in the past three years (103.6 bu/A in the Stuttgart High Input Test). The three year average of these two varieties shows excellent adaptation in Arkansas (Table 1). All available foundation seed of these two lines were sold this year. Certified seed sales of both have been good. 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.

Last fall, the line AR 839-25-8-2 was licensed through an agreement with Delta King and Armor (Cullum) Seed Companies; both will share the license and market the variety in Arkansas. This line will be called AR 839 and will be labeled as an Armor or Delta King variety. This line is very similar in performance to 'Pat' (Table 1).

The experimental line, AR910-9-1 was planted at Marianna in the fall to increase for possible release. It is a fairly early line with excellent resistance to stripe rust. This line has been in the Arkansas Variety test the last two years and this year has been planted in state variety trials in seven other states. After data is collected during 2003-04 a decision will be made about its release.

Table 1. Three-year (2001-2003) average performance across all tests (23) in Arkansas.

Entry Name	Yield	Test wt	Lodg	Pt ht	Head date	Mat. date	Leaf rust	Stripe rust
	bu/A	lb/bu	%	in			%	%
DIXIE 900	76.6	55.1	2	38	4-19	5-22	0	0
DELTA KING 7777	76.3	54.8	8	38	4-20	5-22	30	0
DELTA KING 7900	75.6	54.5	3	38	4-19	5-21	3	0
AGS 2000	74.6	54.9	8	35	4-17	5-21	0	9
ARMOR 3035	74.3	54.3	4	37	4-20	5-22	1	1
CROPLAN GENET. 554W	74.2	54.2	11	33	4-19	5-20	1	24
AGRIPRO SHELBY	74.1	55.8	16	36	4-19	5-21	4	19
AR 839	**74.0**	**55.2**	**3**	**35**	**4-21**	**5-23**	**2**	**0**
DELTA GROW 4888	73.9	54.3	5	38	4-19	5-22	2	0
PAT	**73.7**	**55.6**	**1**	**37**	**4-23**	**5-25**	**2**	**0**
AGRIPRO NATCHEZ	73.6	53.3	17	37	4-21	5-22	0	0
DELTA KING 9216	73.4	53.2	9	37	4-21	5-22	2	3
DELTA KING 155W	72.7	54.2	4	34	4-20	5-22	4	0
PIONEER BRAND 26R24	72.7	53.8	13	35	4-18	5-20	1	14
DIXIE 922	72.5	54.3	6	38	4-20	5-21	1	1
SABBE	**72.2**	**53.9**	**3**	**35**	**4-21**	**5-24**	**12**	**1**
VIGORO TRIBUTE	72.0	56.1	12	32	4-20	5-23	5	5
USG 3209	71.8	54.3	9	31	4-18	5-20	0	7
PIONEER BRAND 26R46	71.7	54.6	3	34	4-18	5-20	1	3
LA 90185G3-1-3-4-2	71.5	53.4	15	35	4-18	5-23	2	38
PIONEER BRAND 26R38	71.5	54.0	5	36	4-18	5-20	6	29
ARMOR 4045	70.8	54.0	6	38	4-20	5-22	4	1
SOUTH. STATES SS 535	70.7	55.9	8	32	4-20	5-21	2	14
PROGENY 156	70.4	53.3	7	36	4-21	5-22	1	1
NK COKER 9663	70.3	55.7	16	37	4-19	5-22	2	10
DELTA GROW 5300	70.2	53.2	14	35	4-20	5-20	3	0
NK COKER 9152	70.2	54.2	13	37	4-18	5-20	0	7
TERRAL TV 8555	70.1	54.0	2	32	4-21	5-22	0	1
SOUTH. STATES SS 522	70.0	55.2	6	34	4-19	5-21	0	17
HBK 3030	69.9	54.1	3	32	4-18	5-21	1	4
USG 3709	69.6	52.4	3	36	4-19	5-22	30	14
ROANE	69.0	55.9	10	32	4-21	5-23	0	3
FFR 510	68.7	53.6	14	35	4-16	5-18	1	63
TERRAL LA841	68.3	53.5	9	33	4-18	5-19	0	0
DELTA KING 9027	68.3	52.4	13	35	4-20	5-22	1	0
DELTA KING 9121	66.2	53.0	8	33	4-20	5-23	0	5
Grand mean	71.9	54.3	8	35	4-19	5-22	3	
LSD (5%)	3.4	0.8						
C.V. (%)	10.3	3.2						

Lodg = Lodging Pt ht = Plant height

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 abandoned due to inadequate stands. The average of the experimental lines over all locations is presented in Table 2. Yields were high and 8 experimental lines had higher yields averaged across locations than that of the standard check variety, NK Coker 9663. AR 910-9-1 which was among the highest yielding lines in the test, will be tested for the third year in the Arkansas Variety Test and in seven other state trials for possible release. AR 93035-4-1, which is a line derived from a cross between Pioneer 2548 and a Romanian line obtained 10 years ago, will be tested for a second year in the Southern Regional trials. Another high yielding line AR93027-3-2 was entered in the Eastern Regional trials. 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. Results are given for the two Arkansas locations in Table 3. There were several experimental lines that appeared promising. These lines were advanced to the Elite test for further testing in 2003-04.

The Wheat Observation Yield nursery was planted at Stuttgart and Keiser. The results from Stuttgart is given in Table 4. This represents the first yield data from lines selected from head rows. Several experimental lines that appeared promising were advanced to the Advanced test for further testing in 2003-04.

To enhance disease resistant to Head Blight (Scab) a special nursery was initiated to screen experimental lines for agronomic traits as well as scab resistance. The results of this nursery are presented in Table 5. Several lines possess the same level of resistance as the resistant check 'Ernie' but have yields similar to 'Pat'. The results for the Wheat Rust evaluation nursery are presented in Table 6. Many of the resistant lines contain one of two genes that were originally derived from the wild grass *Triticum tauschii or* have a gene from another wild grass, *Triticum boeoticum.*

Table 2. Performance of breeding lines and checks in the Elite Wheat Test in 2003 across 2 locations (Stuttgart and Marianna).

Entry	Yield	Test weight	Lodge	Plant ht	Heading date	Maturity date	Leaf rust	Stripe rust
	bu/A	lb/bu	%	in.			%	%
AR839	84.6	54.6	0.0	35	4/18	5/16	1.2	6.3
SHELBY	80.8	54.2	35.8	37	4/17	5/18	2.5	43.3
PAT	80.0	54.2	0.2	31	4/21	5/18	1.7	9.7
AR910-9-1	79.6	53.7	14.5	33	4/15	5/20	0.0	3.7
AR839-28-1-2	78.5	54.0	0.8	.	4/17	.	0.7	2.0
AGS 2000	77.2	54.7	27.5	38	4/15	5/17	1.0	38.3
AR93027-5-1	77.1	53.4	7.5	31	4/18	5/21	1.2	31.7
AR94112-7-1	76.8	51.1	34.3	31	4/19	5/19	2.0	12.3
AR93005-6-5	75.5	54.9	5.0	36	4/17	5/21	0.2	3.7
AR94047-5-1	75.3	51.0	14.3	30	4/20	5/21	0.2	5.3
AR93002-3-3	75.3	53.6	10.7	33	4/19	5/22	0.7	14.7
SABBE	75.3	53.2	3.2	34	4/19	5/21	5.2	14.7
AR93035-4-1	75.2	54.2	0.6	34	4/19	5/19	1.5	30.7
COKER 9663	74.8	54.8	34.0	39	4/16	5/17	4.0	38.3
AR93035-4-2	74.1	54.5	0.2	32	4/19	5/18	1.2	20.0
AR800-1-3-1	73.9	54.5	1.8	33	4/20	5/20	0.0	8.0
AR94071-3-1	73.8	53.9	32.6	33	4/16	5/14	2.2	7.0
AR94150-5-1	73.1	52.4	11.8	36	4/18	5/17	1.5	31.7
AR93027-3-2	72.5	53.8	5.6	36	4/18	5/16	1.0	38.3
AR93005-6-1	71.1	53.0	7.5	32	4/17	5/19	0.2	1.3
AR93173-3-3	71.0	52.3	16.8	33	4/19	5/19	2.0	1.3
AR94060-4-1	70.2	54.8	28.1	35	4/20	5/19	1.0	8.0
AR94168-2-1	69.6	53.0	22.0	36	4/20	5/21	2.2	15.7
AR94123-1-1	65.5	52.7	12.6	33	4/15	5/14	1.2	10.7

Table 3. Performance of breeding lines and checks in the Advanced Wheat Lines Test in 2003 across 2 locations (Stuttgart and Marianna).

Entry	Yield	Test weight	Lodge	Plant ht	Heading date	Mature date	Leaf rust	Uniform	Stripe rust
	bu/A	lb/bu	%	in.			%	0-10	%
AGS 2000	84.8	55.0	24.1	34	4/17	5/24	0.3	8	31.7
SHELBY	82.4	56.0	29.1	36	4/20	5/24	2.6	9	43.3
AR95047-6-1	80.4	57.0	25.0	37	4/15	5/19	1.6	8	29.0
AR95085-4-1	80.4	55.1	10.0	34	4/22	5/22	2.6	8	50.0
COKER 9663	80.2	56.8	21.6	37	4/19	5/22	3.0	9	43.3
AR95049-4-1	78.9	56.4	26.6	35	4/18	5/20	2.6	6	25.0
SABBE	78.4	56.2	3.3	35	4/21	5/20	5.0	8	8.0
PAT	77.5	55.0	5.0	38	4/22	6/01	1.6	9	5.3
AR95073-2-1	76.3	52.4	23.3	35	4/22	5/22	2.0	7	50.0
AR95047-8-1	76.1	57.6	24.0	36	4/18	5/20	1.0	8	22.3
AR95030-3-1	75.6	55.7	15.8	43	4/18	5/27	1.6	6	0.7
AR95048-1-2	74.6	52.6	29.1	35	4/17	5/20	1.0	7	56.7
AR95071-6-1	74.6	52.9	5.8	35	4/21	5/22	1.0	7	25.0
AR95125-1-1	74.4	54.9	27.5	35	4/17	5/22	1.3	8	1.3
AR95021-1-1	73.5	55.3	24.1	35	4/13	5/16	1.0	7	26.7
AR95009-3-1	72.2	54.6	25.0	34	4/19	5/21	2.0	7	12.3
AR95023-4-2	72.1	53.2	34.1	34	4/19	5/19	1.3	8	43.3
AR95121-4-1	71.5	56.0	19.1	39	4/21	6/01	0.0	5	2.0
AR95077-3-2	71.0	56.4	19.1	31	4/21	5/19	3.0	7	68.3
AR95049-3-1	70.9	56.7	32.0	36	4/17	5/19	2.0	6	22.3
AR95053-5-1	70.6	58.0	13.3	37	4/19	5/21	2.3	8	68.3
AR95182-2-1	70.5	53.8	10.0	30	4/18	5/17	1.6	6	0.7
AR95108-5-3	70.5	59.7	15.8	34	4/20	5/21	0.6	9	5.3
AR95009-6-1	70.3	55.7	9.1	29	4/15	5/18	1.6	8	38.3
AR95079-1-3	69.8	53.2	23.3	33	4/21	5/20	1.6	7	38.3
AR95003-5-1	69.6	56.0	20.7	38	4/19	5/18	1.2	8	9.7
AR95047-2-2	69.4	53.8	23.3	34	4/20	5/25	3.0	7	31.7
AR95029-4-1	69.3	56.5	7.5	39	4/20	5/22	3.0	9	50.0
AR95060-3-1	69.1	59.0	4.1	38	4/20	5/19	1.0	7	50.0
AR95071-4-1	68.3	53.1	15.8	33	4/18	5/22	2.6	7	45.0
AR95003-5-2	68.3	57.1	10.8	37	4/19	5/19	1.0	8	31.7
AR95049-5-1	68.2	55.0	5.8	36	4/20	5/23	1.0	6	77.7
AR95031-6-1	68.2	57.2	40.8	35	4/12	5/15	.	8	31.7
AR95071-5-1	68.0	53.3	10.0	33	4/18	5/23	2.3	7	22.3
AR95052-1-2	67.8	50.5	23.3	35	4/21	5/20	1.0	6	8.0
AR95108-5-2	67.7	58.4	14.1	36	4/21	5/22	0.6	9	1.3
AR95060-5-1	66.7	58.0	10.0	35	4/19	5/20	1.6	8	56.7
AR95003-1-1	66.5	57.2	15.0	37	4/18	5/17	0.6	7	5.3
AR95071-7-1	66.5	51.7	7.5	35	4/21	5/23	2.3	7	25.0
AR95003-4-1	66.2	52.7	7.5	31	4/17	5/17	0.3	6	5.3
AR95024-1-1	61.3	53.7	30.0	38	4/24	5/24	1.6	9	36.7
AR95023-7-2	60.8	53.3	31.6	38	4/24	5/25	2.0	9	38.3
AR95079-1-1	60.2	53.9	14.1	33	4/21	5/18	1.3	7	38.3
AR95024-7-2	58.2	54.5	30.8	38	4/23	5/25	1.3	8	45.0
AR95023-6-3	56.0	53.0	35.0	38	4/24	5/24	2.0	9	20.0
AR95024-5-1	54.4	52.9	39.1	38	4/24	5/23	2.0	9	31.7
AR95023-6-1	53.3	57.3	30.8	39	4/24	5/24	2.6	9	31.7

Table 4. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2003 at Stuttgart.

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf green
		bu/A	lb/bu	%	in.			0-10
1	JAYPEE	79.1	57.9	2	33	415	512	2
2	AR 96001-2-1	83.9	57.2	1	34	414	511	1
3	AR 96001-2-2	74.0	55.8	0	35	416	513	3
4	AR 96001-5-1	56.8	56.5	15	38	416	512	2
5	AR 96001-6-1	60.2	54.3	1	40	430	524	5
6	AR 96003-1-1	65.7	57.8	5	35	424	516	5
7	AR 96003-4-1	60.6	58.6	1	39	423	517	4
8	AR 96003-5-1	76.1	58.9	15	35	423	516	4
9	AR 96003-5-2	64.8	58.5	20	36	424	514	4
10	AR 96003-6-1	66.8	58.6	70	38	424	515	4
11	PAT	78.7	57.4	0	38	424	525	4
12	AR 96003-7-1	74.1	58.8	10	41	421	519	4
13	AR 96003-7-2	71.9	58.4	0	39	424	518	4
14	AR 96004-1-1	75.6	54.3	0	36	420	519	5
15	AR 96004-5-1	43.9	50.6	0	37	427	524	3
16	AR 96004-6-1	68.9	52.3	2	33	415	519	3
17	AR 96004-6-2	66.9	55.8	2	33	417	517	3
18	AR 96004-7-1	61.5	52.9	0	36	426	521	4
19	AR 96004-9-1	57.5	54.7	5	37	421	519	3
20	AR 96004-13-1	64.5	54.3	2	35	426	522	4
21	AR 96004-13-2	61.1	52.2	2	34	427	520	4
22	SABBE	70.7	55.5	0	34	422	520	4
23	AR 96005-2-1	61.8	59.8	1	33	420	520	4
24	AR 96005-4-1	52.7	54.9	50	36	419	518	2
25	AR 96007-1-1	51.4	57.2	10	44	419	518	3
26	AR 96007-3-1	68.1	52.9	0	35	420	517	3
27	AR 96007-4-1	69.8	56.5	1	39	419	517	4
28	AR 96007-4-2	72.0	62.7	0	38	419	516	4
29	Chocolat	71.1	56.7	5	42	421	520	4
30	AR 96008-3-1	67.7	55.8	0	33	420	522	4
31	AR 96008-4-1	71.4	56.5	0	32	416	516	3
32	AR 96008-4-2	71.3	54.9	1	31	416	518	3
33	JAYPEE	74.5	57.7	10	32	416	513	3
34	AR 96008-4-3	76.0	57.4	5	34	414	514	1
35	AR 96010-6-1	78.1	57.9	70	41	415	514	2
36	AR 96012-1-1	71.8	59.3	80	39	414	513	3
37	AR 96012-3-1	76.5	59.3	80	40	420	515	3
38	AR 96015-1-1	72.5	58.9	0	37	419	520	4
39	AR 96015-1-2	83.4	60.1	0	37	419	520	4
40	AR 96015-2-1	75.2	57.4	0	39	422	521	3
41	AR 96015-2-2	64.2	55.9	0	35	428	524	5
42	AR 96015-6-1	71.1	58.1	10	37	416	517	3
43	AR 96015-7-1	79.2	57.3	0	38	419	519	3
44	PAT	75.6	57.2	0	39	425	523	5
45	AR 96015-7-2	72.0	55.5	0	38	420	520	3
46	AR 96016-8-1	80.3	58.3	50	38	421	520	4
47	AR 96018-1-1	57.7	55.4	45	38	420	521	4
48	AR 96018-1-2	59.8	53.5	30	40	424	523	4
49	AR 96024-4-1	77.2	52.4	0	31	420	514	3

Table 4. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2003 at Stuttgart (continued).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf green
		bu/A	lb/bu	%	in.			0-10
50	AR 96024-4-2	77.3	52.5	0	32	421	514	3
51	AR 96024-4-3	67.8	59.1	0	32	420	514	3
52	AR 96026-2-1	63.9	60.3	10	42	422	522	4
53	AR 96026-4-1	65.7	60.4	0	35	422	520	4
54	AR 96026-4-2	60.2	59.9	0	31	424	520	4
55	SABBE	76.6	57.9	0	34	423	521	4
56	AR 96027-8-1	70.0	57.4	15	39	421	515	4
57	AR 96028-1-1	69.9	59.7	15	45	421	519	4
58	AR 96028-4-1	62.6	58.6	1	34	424	521	4
59	AR 96031-1-1	76.0	57.6	0	30	420	519	4
60	AR 96031-1-2	74.4	57.2	0	29	420	516	3
61	AR 96042-5-1	71.8	59.4	3	39	419	526	3.5
62	AR 96046-2-1	68.1	59.1	0	35	421	520	3
63	AR 96046-2-2	70.2	57.0	0	31	422	519	3
64	AR 96049-2-1	73.8	55.8	0	28	422	521	3.5
65	AR 96052-2-1	70.5	58.1	80	42	420	515	3.5
66	JAYPEE	70.3	57.7	20	34	417	513	2
67	AR 96052-4-1	79.5	56.9	0	35	418	514	3
68	AR 96052-4-2	73.3	55.5	0	34	420	515	3
69	AR 96052-4-3	75.5	59.6	0	33	420	515	3
70	AR 96052-6-1	64.9	60.5	0	28	421	518	3.5
71	AR 96052-6-2	59.8	60.2	0	29	421	518	3
72	AR 96054-4-1	62.7	59.5	90	42	418	515	2
73	AR 96056-1-1	65.8	58.3	80	36	420	515	3
74	AR 96056-4-1	66.6	59.1	75	39	419	516	2
75	AR 96056-5-1	71.8	56.6	0	33	419	521	3
76	AR 96056-5-2	76.2	56.6	0	32	419	521	3
77	PAT	73.6	57.7	0	37	425	524	5
78	AR 96056-6-1	58.9	57.4	50	39	417	518	3
79	AR 96062-6-1	72.0	61.4	0	38	418	518	4
80	AR 96062-8-1	68.0	59.1	0	38	417	515	4
81	AR 96068-1-1	57.5	57.2	25	36	423	518	3.5
82	AR 96068-2-1	69.6	57.0	0	31	420	519	2.5
83	AR 96068-2-2	68.0	56.1	0	29	420	519	2.5
84	AR 96068-3-1	45.2	52.7	35	32	419	515	3
85	AR 96071-6-1	63.1	60.5	35	41	422	521	3
86	AR 96072-3-1	45.0	56.9	5	42	424	523	4
87	AR 96072-3-2	53.2	56.2	5	43	425	524	3
88	SABBE	72.8	57.1	0	35	421	520	4
89	AR 96072-4-1	64.0	53.1	0	36	418	519	2
90	AR 96072-5-1	56.0	58.1	1	35	425	524	3
91	AR 96073-2-1	67.1	57.2	2	37	422	520	3
92	AR 96073-4-1	63.4	57.9	5	39	422	519	2
93	AR 96075-1-1	60.6	56.1	0	37	420	522	2
94	AR 96075-1-2	64.4	56.5	0	38	420	523	2
95	AR 96075-3-1	59.8	56.5	0	37	421	523	3.5
96	AR 96075-5-1	65.0	57.2	0	35	421	521	3
97	AR 96075-5-2	64.1	58.4	0	33	421	522	2.5

Table 4. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2003 at Stuttgart (continued).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf green
		bu/A	lb/bu	%	in.			0-10
98	AR 96075-6-1	62.2	59.1	2	35	421	519	2
99	JAYPEE	71.8	58.0	3	34	417	515	2.5
100	AR 96075-8-1	54.0	57.5	0	36	422	519	2
101	AR 96075-8-2	62.0	56.2	0	35	420	521	3
102	AR 96075-9-1	60.7	55.8	2	35	424	522	2
103	AR 96075-9-2	53.2	55.5	0	34	421	522	1
104	AR 96075-9-3	65.6	56.0	0	38	421	521	2
105	AR 96077-1-1	71.5	56.6	0	39	422	519	3
106	Chocolat	77.9	58.4	0	27	420	518	3
107	AR 96077-2-1	80.0	57.2	0	32	418	517	2
108	AR 96077-3-1	71.7	58.6	0	33	424	518	4
109	AR 96077-5-1	68.8	56.5	0	33	422	516	3.5
110	AR 96077-7-1	69.9	57.1	0	29	423	519	3
111	PAT	71.5	57.3	0	36	426	522	5
112	AR 96077-7-2	72.7	56.0	0	30	421	521	4
113	AR 96077-7-3	79.2	57.3	0	29	422	520	3
114	AR 96077-10-1	77.2	58.4	0	30	420	516	3
115	AR 96077-11-1	71.9	58.6	0	29	421	515	4
116	AR 96077-11-2	58.8	58.8	0	31	421	518	4
117	AR 96081-1-1	71.3	56.7	5	34	420	520	2
118	AR 96081-1-2	67.9	56.6	5	32	420	519	2
119	AR 96081-3-1	64.5	55.5	1	36	425	523	3
120	AR 96081-3-2	57.4	55.1	5	34	425	523	3.5
121	AR 96081-3-3	69.1	57.3	1	33	426	521	4
122	SABBE	79.4	56.7	0	35	424	520	4
123	AR 96081-3-4	67.9	57.2	2	36	425	522	4
124	AR 96081-6-1	76.7	59.7	0	32	425	520	4
125	AR 96081-7-1	72.9	57.1	2	32	423	519	4
126	AR 96081-7-2	75.1	56.6	2	33	422	518	4
127	AR 96082-2-1	66.6	55.7	2	32	424	521	4
128	AR 96082-3-1	69.0	56.4	5	31	421	521	3
129	AR 96082-3-2	81.1	58.1	0	32	420	520	3.5
130	AR 96086-1-1	61.1	55.6	0	31	421	521	3
131	AR 96086-1-2	62.5	56.0	0	31	419	519	2.5
132	AR 96086-2-1	83.4	58.1	2	33	419	517	3
133	JAYPEE	72.4	57.4	2	33	417	516	2
134	AR 96086-6-1	69.2	57.7	1	31	416	519	2
135	AR 96120-3-1	66.5	58.4	0	39	417	525	3
136	AR 96131-5-1	51.3	51.7	0	34	418	520	2
137	AR 96131-10-1	73.9	58.1	20	35	416	514	2.5
138	AR 96132-1-1	70.0	55.1	0	33	416	514	2.5
139	AR 96133-1-1	65.9	56.6	15	45	419	517	3
140	AR 96133-1-2	70.8	56.8	40	45	418	517	3
141	AR 96133-1-3	67.3	57.4	30	44	420	516	3
142	AR 96133-3-1	70.9	56.6	25	44	418	516	2
143	AR 96134-1-1	66.8	56.3	0	35	420	522	3
144	PAT	73.3	56.4	0	37	424	522	4.5
145	AR 96134-5-1	69.1	57.3	10	42	419	515	3

Table 4. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2003 at Stuttgart (continued).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf green
		bu/A	lb/bu	%	in.			0-10
146	AR 96134-5-2	65.5	57.2	40	41	419	515	3
147	AR 96134-5-3	67.6	57.2	25	41	417	514	3
148	AR 96134-5-4	65.5	57.7	10	40	417	515	3
149	AR 96135-2-1	55.5	53.9	0	35	421	517	1
150	AR 96135-3-1	54.6	53.2	5	34	420	516	1
151	AR 96135-3-2	55.4	54.6	5	35	420	517	1
152	AR 96135-3-3	54.5	55.2	10	35	420	518	1.5
153	AR 96135-4-1	70.4	55.4	2	33	419	514	3
154	AR 96135-7-1	77.5	57.4	0	33	418	515	3.5
155	SABBE	68.2	57.4	0	33	422	521	4
156	AR 96135-7-2	75.5	57.9	0	32	420	518	3
157	AR 96135-7-3	65.7	54.4	1	33	423	517	3
158	AR 96136-4-1	61.3	55.8	0	30	417	515	1.5
159	AR 96136-5-1	68.1	57.3	0	30	418	518	2
160	AR 96136-5-2	64.6	57.0	1	30	418	517	2
161	AR 96136-8-1	71.7	56.0	0	31	414	517	2
162	AR 96136-8-2	58.9	55.3	0	30	416	517	2.5
163	AR 96138-1-1	74.0	56.4	1	33	418	521	3
164	AR 96138-6-1	70.1	55.5	2	33	417	521	2.5
165	AR 96138-6-2	69.4	57.6	0	34	418	520	3
166	JAYPEE	71.8	58.1	10	34	414	514	2.5
167	AR 96138-7-1	78.8	56.3	0	34	419	521	3
168	AR 96139-3-1	64.5	56.4	2	34	417	519	2.5
169	AR 96139-4-1	68.6	56.2	5	32	417	518	2
170	AR 96140-3-1	69.5	56.7	5	33	420	521	2.5
171	AR 96140-8-1	73.7	57.1	2	31	419	517	3
172	AR 96141-4-1	73.9	58.0	0	34	421	519	3
173	AR 96141-5-1	79.4	59.1	0	33	421	520	3
174	AR 96142-1-1	57.8	54.3	0	32	420	520	3.5
175	AR 96142-2-1	72.4	58.8	0	34	420	517	3
176	AR 96142-3-1	59.4	53.9	2	34	422	515	2.5
177	PAT	69.7	57.7	0	36	424	521	4
178	AR 96142-7-1	68.7	59.2	0	29	420	517	3
179	AR 96142-8-1	66.8	58.2	0	30	420	518	3
180	AR 96143-1-1	70.0	55.8	0	31	420	518	2.5
181	AR 96143-3-1	65.7	57.2	0	30	419	517	2
182	AR 96143-3-2	65.1	56.2	0	30	419	518	2
183	AR 96143-3-3	64.2	57.0	0	31	418	519	2.5
184	AR 96143-8-1	71.2	55.6	0	35	418	517	2.5
185	AR 96143-8-2	62.9	54.8	0	30	420	520	3
186	AR 96144-4-1	61.6	57.7	5	38	422	520	3
187	AR 96144-5-1	62.5	59.1	0	37	420	519	2.5
188	SABBE	61.7	57.1	0	33	424	521	4
189	AR 96144-7-1	56.2	55.0	0	29	423	522	3
190	AR 96146-2-1	67.5	54.7	10	31	420	515	3
191	AR 96146-2-2	62.9	55.0	5	31	421	516	3
192	AR 96146-2-3	65.6	55.1	15	33	422	515	3
193	AR 96146-3-1	73.7	58.3	0	30	416	517	2

Table 4. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2003 at Stuttgart (continued).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf green
		bu/A	lb/bu	%	in.			0-10
194	AR 96146-4-1	69.9	56.6	0	44	421	527	3
195	AR 96147-1-1	60.9	58.2	1	39	418	520	2.5
196	AR 96147-4-1	71.4	59.1	0	45	420	521	3
197	AR 96147-4-2	63.4	59.0	0	44	418	521	2.5
198	AR 96147-5-1	56.9	52.9	2	34	421	517	2.5
199	JAYPEE	72.2	58.1	2	34	414	514	1.5
200	AR 96148-1-1	70.4	56.2	0	31	420	519	3
201	AR 96148-1-2	68.7	57.1	0	29	417	519	3
202	AR 96148-1-3	68.5	56.5	0	30	419	520	2.5
203	AR 96150-1-1	58.7	56.2	1	40	424	528	3
204	AR 96150-2-1	73.6	58.1	4	30	416	514	2.5
205	AR 96150-2-2	70.9	58.2	5	30	417	514	3
206	AR 96150-2-3	69.7	56.8	10	28	420	514	3
207	AR 96151-3-1	62.3	55.8	0	28	417	515	2
208	AR 96151-6-1	60.5	58.1	1	30	418	516	1.5
209	AR 96151-6-2	69.0	58.6	0	31	416	515	2
210	AR 96151-7-1	60.1	56.1	0	31	425	519	3
211	PAT	73.2	56.7	0	35	423	520	4
212	AR 96152-1-1	62.5	57.7	0	37	420	521	2
213	AR 96152-2-1	68.7	57.4	0	30	422	519	2
214	AR 96152-2-2	63.2	54.8	0	32	416	517	1.5
215	AR 96152-5-1	67.3	54.9	0	31	423	521	3
216	AR 96153-1-1	65.4	56.2	2	36	422	520	3
217	AR 96153-1-2	64.6	56.2	2	36	421	516	3
218	AR 96153-2-1	68.1	59.6	10	37	421	517	3
219	AR 96153-2-2	62.1	59.2	5	35	421	516	3
220	AR 96153-3-1	65.6	57.9	10	36	422	519	3
221	AR 96153-3-2	61.1	56.7	5	36	422	520	3
222	SABBE	78.6	57.8	0	34	421	520	4
223	AR 96154-2-1	74.9	58.1	2	32	414	515	2
224	AR 96154-5-1	74.3	56.8	1	33	413	513	3
225	AR 96154-6-1	67.6	58.7	2	33	419	517	3
226	AR 96156-7-1	40.2	60.5	15	36	416	514	2
227	AR 96158-1-1	65.4	53.1	2	30	421	516	2.5
228	AR 96158-1-2	65.1	53.9	2	31	422	514	2.5
229	AR 96158-2-1	72.3	56.7	2	29	420	514	3
230	AR 96158-5-1	56.8	57.3	3	42	421	515	3
231	AR 96158-6-1	53.2	51.7	0	29	420	514	3
232	AR 96161-3-1	61.5	57.2	0	33	420	521	3
233	JAYPEE	71.0	57.4	10	30	413	514	2
234	AR 96161-4-1	73.9	55.4	0	32	422	519	2.5
235	AR 96161-4-2	76.7	56.1	0	31	421	520	3
236	AR 96161-5-1	76.4	58.6	30	36	419	520	3
237	AR 96161-5-2	73.6	57.8	10	37	417	521	2.5
238	AR 96162-2-1	60.1	56.1	25	39	423	520	1.5
239	AR 96162-2-2	68.2	56.6	25	37	422	519	2
240	AR 96163-1-1	74.2	55.3	0	38	418	514	3
241	AR 96163-3-1	72.2	56.7	25	34	412	513	2.5

Table 4. Performance of breeding lines and checks in the Wheat Observation Yield Nursery in 2003 at Stuttgart (continued).

Entry #	Entry Name	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf green
		bu/A	lb/bu	%	in.			0-10
242	AR 96163-4-1	65.8	58.3	30	33	413	512	3
243	AR 96164-1-1	51.5	58.6	30	43	417	515	2.5
244	PAT	63.7	57.2	0	35	425	520	4
245	AR 96164-3-1	62.2	58.6	0	34	415	514	1

Table 5. Performance of breeding lines and checks in the inoculated Scab Yield Nursery in 2003 across 2 locations (Stuttgart and Marianna).

Entry	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf rust
	bu/A	lb/bu	%	in.			%
PAT	73.9	54.6	1	38	4/22	5/24	2.0
AR93108-3-2	71.1	54.2	3	35	4/16	5/17	0.7
AR93035-4-2	71.0	54.6	1	33	4/21	5/21	3.3
ARGE971043-6a-5	70.7	55.5	3	37	4/21	5/20	0.3
AR93035-4-1	70.7	55.4	0	35	4/23	5/22	2.7
AR93035-4-3	69.7	56.2	0	36	4/22	5/22	3.0
AR93035-4-4	69.2	54.4	0	35	4/21	5/23	3.0
ARGE97-1033-10-	69.0	54.9	13	40	4/22	5/23	1.0
AR93095-4-1	68.9	52.1	13	39	4/22	5/17	2.0
AR93108-1-3	68.0	53.1	12	32	4/18	5/20	2.0
ARGE97-1022-5-1	67.3	54.5	8	36	4/21	5/21	1.3
AR93001-3-2	66.9	56.3	16	37	4/16	5/19	2.0
AR93069-5-1	66.7	57.3	7	37	4/18	5/20	2.0
AR93035-7-1	66.6	54.7	0	34	4/20	5/21	3.3
AR93108-9-1	66.4	52.7	5	33	4/16	5/16	3.7
AR922-5-1	66.4	56.8	19	37	4/16	5/18	1.7
AR93019-2-1	66.1	52.1	0	33	4/21	5/21	2.3
AR857-1-2	64.4	55.3	8	41	4/15	5/16	.
AR857-1-1	63.7	55.7	6	40	4/15	5/16	.
ARGE97-1064-13-	62.9	52.6	13	41	4/20	5/23	0.7
ARGE97-1008-3-3	62.4	56.2	15	39	4/17	5/25	1.7
ARGE971064-11-5	62.2	52.8	16	39	4/20	5/23	2.7
AR880-5-1	62.1	53.9	13	37	4/18	5/19	2.0
ARGE971010-3-5	60.7	55.7	28	38	4/17	5/20	0.0
ERNIE	60.7	54.0	11	37	4/21	5/23	1.3
AR878-2-1	60.3	55.2	4	39	4/15	5/18	4.0
AR93091-4-2	59.7	54.9	6	37	4/21	5/24	0.3
ARGE97-1060-5-5	56.6	55.2	41	40	4/20	5/19	1.0
Mean	65.9	54.7	9.3	36.9	4/19	5/20	1.9
LSD_{05}	7.5	1.4	13.3	4.2	3.2	4.1	1.6
CV%	10.0	2.3	125.6	5.6	0.4	0.4	52.0

Table 6. Performance of breeding lines and checks in the Leaf Rust Yield Nursery in 2003 across 2 locations (Stuttgart and Marianna).

Entry	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf rust
	bu/A	lb/bu	%	in.			%
ARGE97-3005-17-	81.4	55.8	13	35	4/16	5/19	1.7
ARLA85411	80.7	54.5	5	32	4/20	5/17	0.0
ARGE97-1017-4-1	79.7	56.3	3	35	4/19	5/20	0.7
SABBE	75.8	54.7	0	36	4/20	5/18	7.7
ARGE97-3004-22A	75.3	51.8	5	36	4/16	5/26	3.0
AR96071-32	75.3	53.1	3	29	4/18	5/17	1.3
AR96071-13	74.7	53.4	13	31	4/15	5/17	4.0
ARGE97-0030-3-3	74.1	55.8	5	36	4/19	5/20	0.3
ARGE97-1058-4-2	74.0	56.5	3	28	4/21	5/19	1.7
AR96068-28	73.4	52.0	39	33	4/19	5/19	3.7
AR96068-6	73.1	54.7	36	34	4/19	5/17	6.0
AR96068-27	72.7	52.0	22	32	4/19	5/18	3.3
AR96071-76	72.0	53.1	1	28	4/20	5/17	6.3
AR96071-23	71.8	52.6	5	28	4/15	5/17	7.7
AR93039-6-1	71.6	54.9	3	34	4/23	5/25	0.3
AR93005-6-2	71.4	55.1	3	33	4/22	5/21	0.0
ARGE97-0027-3-3	71.4	58.8	7	36	4/18	5/18	1.3
AR96071-29	71.0	52.5	2	31	4/19	5/19	5.0
AR96071-25	70.5	51.5	0	27	4/19	5/17	5.7
AR93005-6-1	70.1	56.0	5	34	4/20	5/22	0.7
AR96068-47	69.8	54.1	12	30	4/17	5/19	3.0
ARGE97-3002-2-1	69.1	52.7	23	39	4/19	5/19	0.7
AR93039-1-1	69.1	55.8	2	35	4/24	5/24	0.3
ARGE97-0006-6-5	68.9	56.4	7	34	4/14	5/18	0.7
AR93127-3-1	68.7	56.2	10	35	4/17	5/18	2.0
AR96068-69	68.5	53.9	4	33	4/21	5/20	3.7
AR96068-44	68.5	55.2	6	31	4/24	5/23	3.3
ARGE97-0016-5-6	68.1	55.0	15	31	4/15	5/18	0.7
AR96068-11	68.0	53.3	23	32	4/20	5/19	5.3
AR93110-9-4	67.9	55.3	7	36	4/20	5/22	1.3
AR96068-10	67.8	54.1	7	33	4/21	5/20	3.7
ARGE97-0002-3-4	67.5	52.0	8	36	4/17	5/18	0.3
ARGE97-1016-3-2	66.8	52.1	8	34	4/20	5/20	3.3
AR93005-6-4	66.3	54.4	3	35	4/20	5/21	0.3
AR96001-13	66.0	54.4	12	38	4/20	5/17	3.7
ARGE97-0021-1-4	65.7	57.8	3	36	4/20	5/21	0.3
AR96068-8	65.7	53.6	9	33	4/20	5/18	4.3
AR96071-26	65.7	53.0	13	29	4/17	5/19	6.7
ARGE97-0001-11-	65.4	55.5	4	33	4/22	5/25	0.7
AR96001-18	64.5	50.5	10	34	4/22	5/17	5.7
HAZEN	64.3	52.5	0	35	4/21	5/22	3.0
AR96001-54	63.5	53.6	42	38	4/18	5/19	3.7
AR96001-35	62.5	52.1	13	34	4/21	5/20	3.3
AR96005-38	60.9	51.7	12	33	4/18	5/18	2.7
AR96001-61	60.7	54.5	11	42	4/20	5/20	0.0
AR96001-38	60.6	54.9	39	35	4/15	5/17	5.7

Table 6. (continued).

Entry	Yield	Test weight	Lodge	Pl ht	Heading date	Maturity date	Leaf rust
	bu/A	lb/bu	%	in.			%
ARGE97-0031-2-6	60.2	54.1	10	32	4/18	5/19	2.7
AR908-8-2	59.6	50.8	13	34	4/24	5/21	3.3
AR96001-17	59.4	53.9	35	38	4/19	5/18	3.7
AR96001-79	58.6	53.1	19	42	4/21	5/21	3.7
AR96001-72	58.4	53.1	12	38	4/18	5/18	0.7
AR908-8-1	57.7	51.7	23	34	4/25	5/22	4.3
AR96071-35	54.6	51.2	0	29	4/20	5/18	5.0
ARGE97-3003-1-5	52.5	54.0	10	35	4/17	5/27	0.7

3) EARLY GENERATIONS

During the winter the greenhouse crossing program to produce future lines was expanded. There were 250 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 years crosses (161 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 179 F_2 populations, 450 F_3 populations and 200 F_4 populations produced. Individual plants were selected from the F_6 generation at Fayetteville to produce experimental lines which were planted at Stuttgart and Keiser this fall to begin yield testing.

Table 7. List of crosses made in the greenhouse during the winter of 2003.

AGS2000/AR908-8-2	AR857-1-2/AR908-8-1
AGS2000/AR93005-6-1	AR857-1-2/AR93035-4-1
AGS2000/SAVAGE	AR857-1-2/AR93035-4-2
ARMORX5222/AR839-28-1-2	AR857-1-2/COKER9663
ARMORX5222/AR93035-4-2	AR857-1-2/PAT
ARMORX5222/COKER9663	AR857-1-2/PIO26R38
ARMORX5222/GENESISR023	AR857-1-2/SABBE
ARMORX5222/PIO26R38	AR857-1-2/SABBE
ARMORX5222/SAVAGE	AR857-1-2/WQLGJ07-BHWX2-29
ARMORX5222/SAVAGE	AR857-1-2/WQLGJ07-BHWX2-29
AR800-1-3-1/AR839-28-1-2	AR908-8-1/AR910-9-1
AR800-1-3-1/AR908-8-1	AR908-8-1/AR93035-4-2
AR800-1-3-1/AR93005-6-1	AR908-8-1/AR93035-4-2
AR800-1-3-1/AR93005-6-4	AR908-8-1/COKER9663
AR800-1-3-1/AR93035-4-2	AR908-8-1/COKER9663
AR800-1-3-1/GENESISR023	AR908-8-1/G/F931241E16
AR800-1-3-1/PAT	AR908-8-1/PAT
AR800-1-3-1/PAT	AR908-8-1/PAT
AR800-1-3-1/PIO26R38	AR908-8-1/SABBE
AR800-1-3-1/SAVAGE	AR908-8-1/SABBE
AR800-1-3-1/SAVAGE	AR908-8-2/AGS2000
AR839-10-1-1/AR908-8-1	AR908-8-2/CLARKSCREAM
AR839-10-1-1/ARMORX5222	AR908-8-2/COKER9663
AR839-10-1-1/CLARKSCREAM	AR908-8-2/SAVAGE
AR839-10-1-1/COKER9663	AR910- 9-1/AR800-1-3-1
AR839-28-1-2/COKER9663	AR910-9-1/AR857-1-2
AR857-1-1/PAT	AR910-9-1/AR93005-6-1
AR857-1-1/WQL6KJ07-BHWX2-29	AR910-9-1/AR93035-4-2
AR857-1-1/128	AR910-9-1/AR93095-4-1
AR857-1-2/AR908-8-1	AR910-9-1/AR93095-4-1
AR857-1-2/AR908-8-1	AR910-9-1/ARMORX5222

AR910-9-1/MAROUANI
AR910-9-1/PAT
AR910-9-1/PAT
AR910-9-1/PAT
AR910-9-1/WQLGJ07-BHWX2-29
AR910-9-1/WQLGJ07-BHWX2-29
AR910-9-1/WQLGJ07-BHWX2-29
AR910-9-1/WQLGJ07-BHWX2-29
AR910-9-1/WQLGJ07-BHWX2-29
AR910- 9-1/GENESISR023
AR93002-3-3/PAT
AR93002-3-3/AR93027-3-2
AR93005-1-4/AR93035-4-2
AR93005-6-1/AR908-8-1
AR93005-6-1/AR910-9-1
AR93005-6-1/ARMORX5222
AR93005-6-1/AR93035-4-2
AR93005-6-1/GENESISR023
AR93005-6-1/GENESISX023
AR93005-6-1/PIO26R38
AR93005-6-1/SAVAGE
AR93005-6-4/F/693/233E17
AR93005-6-4/PAT
AR93027-3-2/ARMORX5222
AR93027-3-2/AR839-28-1-2
AR93027-3-2/AR93035-4-2
AR93027-3-2/G/F/931241E16
AR93027-3-2/SAVAGE
AR93027-5-1/AR839-10-1-1
AR93027-5-1/AR93002-3-3
AR93027-5-1/AR93095-9-1
AR93027-5-1/G/F/931241E16
AR93027-5-1/G/F/931241E16
AR93035-4-1/AGRIPROSAVAGE
AR93035-4-1/AR800-1-3-1
AR93035-4-1/AR857-1-2
AR93035-4-1/AR908-1-2
AR93035-4-1/AR908-8-1
AR93035-4-1/AR910-9-1
AR93035-4-2/ARMORX5222
AR93035-4-2/AR800-1-3-1
AR93035-4-2/AR857-1-2
AR93035-4-2/AR910-9-1
AR93035-4-2/AR93027-3-2
AR93035-4-2/CLARKSCREAM
AR93035-4-2/CLARKSCREAM
AR93035-4-2/COKER9663
AR93035-4-2/GENESISR023
AR93035-4-2/PAT
AR93035-4-2/PAT
AR93035-4-2/PIO26R38
AR93035-4-2/WQLGJ07-BHWX2-29
AR93035-6-1/AR908-8-1
AR93095-4-1/AR800-1-3-1
AR93095-4-1/COKER9663
AR93095-4-1/GF93124E16
AR93173-3-3/PIO26R38
BETTY/SAVAGE
BRONZE839/AR910-9-1
BRONZE 839/GOLDEN BALL
BRONZE839/MAROUANI
BRONZE839/MAROUANI
BRONZE839/128
BRONZE839/9620
BRONZE839/9620
BRONZE839/9620
CLARKSCREAM/AR93035-4-1
CLARKSCREAM/AR93035-4-2
CLARKSCREAM/G/F931241E16
CLARKSCREAM/PAT
COKER9663/ARMORX5222
COKER9663/ARMORX5222
COKER9663/AR839-28-1-2
COKER9663/AR908-8-1
COKER9663/AR908-8-1
COKER9663/AR93027-3-2
COKER9663/AR93027-5-1
COKER9663/AR93035-4-2
COKER9663/AR93035-4-2
COKER9663/AR93095-4-1
COKER9663/PIO26R38
COKER9663/PIO26R38
F/G931233E17/AR800-1-3-1
F/G931233E17/AR839-28-1-2
F/G931233E17/AR93035-4-2
F/G931233E17/CLARKSCREAM
F/G931233E17/PAT
GENESISR023/AGS2000
GENESISR023/AR908-8-1
GENESISR023/AR908-8-1

GENESISR023/AR910-9-1
GENESISR023/AR93173-3-3
GENESISR023/AR93173-3-3
GENESISR023/COKER9663
GENESISR023/GF931241E16
GF93124E16/AR800-1-3-1
GF93124E16/AR908-8-1
GF931241E16/AR910-9-1
GF931241E16/AR910-9-1
GF931241E16/AR93035-4-2
GF931241E16/SAVAGE
GF931241E16/SAVAGE
GOLDEN BALL/BRONZE839
GOLDEN BALL/BRONZE839
GOLDEN BALL/SABBE
GOLDEN BALL/VELVET DON
GOLDEN BALL/WASH 2628
MAROUANI/GOLDEN BALL
MAROUANI/SABBE
MAROUANI/SABBE
MAROUANI/VIKING
MAROUANI/128
PAT/AR800-1-3-1
PAT/AR857-1-2
PAT/AR908-8-1
PAT/AR910-9-1
PAT/AR910-9-1
PAT/AR93002-3-3
PAT/AR93005-6-1
PAT/AR93035-4-2
PAT/AR93035-4-2
PAT/AR93035-4-2
PAT/AR93095-4-1
PAT/GENESISR023
PAT/SABBE
PAT/WQLGKJ07BHWX-2-29
PAT/WQLGKJ07BHXW-2-29
PAT/02174
PAT/02174
PAT/02174
PIO25W33/G/F931241E16
PIO25W33/GENESISR023
PIO25W60/BETTY
PIO25W60/CLARKSCREAM
PIO25W60/SAVAGE
PIO26R38/AR857-1-2
PIO26R38/AR857-1-2
PIO26R38/AR908-8-1
PIO26R38/AR910-9-1
PIO26R38/AR910-9-1
PIO26R38/AR93027-3-2
PIO26R38/AR93035-4-2
PIO26R38/AR93095-4-1
PIO26R38/AR93095-4-1
PIO26R38/AR93835-4-2
PIO26R38/COKER9663
PIO26R38/PAT
PIO26R38/SAVAGE
PIO26R38/SAVAGE
SABBE/ARMORX5222
SABBE/AR857-1-2
SABBE/AR908-8-1
SABBE/AR908-8-1
SABBE/AR910-9-1
SABBE/AR910-9-1
SABBE/AR910-9-1
SABBE/93035-4-2
SABBE/93035-4-2
SABBE/BRONZE839
SABBE/BRONZE839
SABBE/COKER9663
SABBE/GENESISR023
SABBE/GOLDENBALL
SABBE/MAROUANI
SABBE/MAROUANI
SABBE/WQLGKJO7BHXW-2-29
SABBE/02174
SABBE/128
SABBE/9620
SAVAGE/AR839-28-1-2
SAVAGE/AR839-28-1-2
SAVAGE/AR908-8-1
SAVAGE/GENESISR023
SAVAGE/G/F931241E16
SAVAGE/PIONER26R38
VELVET DON/PAT
WASH2628/GOLDENBALL
WASH2628/VIKING
WQLGKJO7BHXW-2-29/AR857-1-2
WQLGKJO7BHXW-2-29/AR857-1-2

WQLGKJO7BHXW-2-29/AR910-9-1
WQLGKJO7BHXW-2-29/PAT
WQLGKJO7BHXW-2-29/PAT
WQLGKJO7BHXW-2-29/PAT
WQLGKJO7BHXW-2-29/PAT
128/BRONZE839
9620/BRONZE839
9620/PAT

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 200 crosses in the greenhouse to produce new populations. Some specific highlights from this year's work:

➜ Sabbe had the highest recorded yield of any of variety at any location the past 3 years (103.6 bu/A)

➜ Certified seed of Pat and Sabbe sold.

➜ AR 839-25-8-2 released through a marketing agreement with Armor and Delta King Seed Companies.

➜ Breeder seed of AR910-9-1 planted 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.

BUDGET REQUEST (2002-03)

		AWPB	AAES	
PERSONNEL:				
Salaries -	Project Leader		-	60,000
	Sr. Research Associate (25%)		11,604	34,812
	Research Associate (50%)		19,361	19,361
	Research Specialist (25%)		4,500	13,500
Wages	(1800 hr @ $6)		10,800	-
Fringe Benefits	($33,688 @ 23.45%)		8,317	27,148
	($10,800 @ 0.21%)		23	-
Total Personnel			54,605	154,821
TRAVEL:				
Instate				
Per Diem (100 days @ $50)			5,000	-
Vehicle			-	2,000
Total Travel			5,000	2,000
EQUIPMENT:				
Depreciation				6,000
MAINTENANCE/OPERATIONS:				
Expendable Supplies			2,500	-
Fertilizer/Chemicals			2,500	-
Fuel			1,500	-
Computer Supplies			500	800
Greenhouse & Growth Chamber Fees			1,500	1500
Equipment Repairs			2,000	-
Breeder Seed Production			900	1,000
Total Maintenance/Operations			10,500	3,300
OFF CAMPUS RESEARCH ALLOCATIONS:				
Keiser			400	2000
Kibler		300	1000	Stuttgart
	500 2000			
Marianna			400	1000
Rohwer			300	1000
TOTAL BUDGET			**$72,905**	**$173,121**