ANNUAL REPORT
WHEAT RESEARCH AND PROMOTION BOARD
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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, winterhardiness, 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:

The Division of Agriculture Plant Release Committee voted in August to release AR839-27-1-3. Approximately 1000 bu of Foundation Seed was sold this fall. AR494B-2-2 has been exclusively released through Cullum Seeds and is now sold under the name Armor 3235. Foundation seed of ARLA 85411 has been planted this fall for release in 2002. Breeder seed of AR 839-25-8-2 has been planted at Stuttgart for possible release as a private marketing agreement. Two additional lines are being increased for possible release in 2003 AR850-1-1 and AR910-9-1. With the recent release of AR839-27-1-3 the breeding program will have released 8 varieties in an 9 year period.

Field work this past year went well. All six locations were planted in the optimum planting period and excellent stands were obtained at all locations with the exception of Rohwer and Kibler which had poor stands due to excess rainfall shortly after planting. These plots were abandoned shortly after planting so no data was collected from these sites. During the spring, the projects 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) eight experimental lines had yields higher than that of NK Coker 9663 averaged across all locations.

During the winter the greenhouse crossing program to produce future lines was expanded There

were three main efforts: 1) standard variety development (150 crosses), 2) scab-resistant varieties (35 crosses), and 3) imidazolinone herbicide resistant varieties (50 crosses).

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 (4 locations), and Elite Wheat Lines (4 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.

The Division of Agriculture's Plant Release Committee met in August and voted to release AR 839-27-1-3. Performance of AR 839-27-1-3 for a two year period average over both the standard and high input test in Arkansas is given in Table 1. AR 839-27-1-3 was also tested in Mississippi and Louisiana this past growing season and those results are presented in Table 2. AR 494B-2-2 was released through a marketing agreement with Cullum Seeds and is now sold under the name Armor 3235.

ARLA 85411 is also being considered as a possible release and has been tested in Mississippi and surrounding States. It has performed well in Arkansas (Table 1.) and foundation seed is being grown this fall for release in the summer of 2002. Breeder seed of AR 839-25-2 was planted at Stuttgart this fall with a possible release through a marketing agreement next year.

Table 1. SVT and HVT tests for two years (2000-2001).

Entry Name	Yield	Test wt	Ldg	Pt ht	Head date	Mat date	Leaf rust
	bu/A	lb/bu	%	in			%
AGS 2000	81 9	56 2	2	34	4-08	5-21	0
ARMOR 3035	79 3	55 3	2	36	4-13	5-22	2
USG 3209	78 9	55 4	6	30	4-10	5-21	1
DIXIE 900	78 7	55 3	2	36	4-12	5-22	4
ARMOR 2025	78 6	54 5	3	35	4-10	5-22	1
PIONEER BRAND 26R24	77 8	54 8	8	33	4-11	5-21	0
PIONEER BRAND 26R38	77 7	55 1	1	36	4-09	5-20	2
DELTA KING XTJ9486	77 6	54 9	1	36	4-13	5-22	2
DELTA KING 1551W	77 6	54 5	2	33	4-14	5-23	2
TERRAL TV 8555	77 4	55 0	0	31	4-13	5-22	1
AGRIPRO NATCHEZ	77 4	54 4	7	36	4-14	5-24	1
DIXIE 922	77 2	54 5	2	36	4-13	5-22	2
NK COKER 9663	76 7	56 5	6	36	4-10	5-22	1
ARMOR 4045	76 6	54 4	3	36	4-12	5-22	2
FFR 558W	76 3	56 0	3	35	4-15	5-24	1
STINE 422	76 3	53 8	6	33	4-10	5-21	26
PIONEER BRAND 2684	76 3	56 1	1	32	4-09	5-20	5
AGRIPRO SHELBY	76 2	56 2	6	34	4-10	5-22	1
AR LA85411	**76.2**	**56.8**	**3**	**33**	**4-12**	**5-21**	**0**
PIONEER BRAND 26R46	76 1	55 5	1	33	4-09	5-21	0
PROGENY 156	76 1	54 0	3	35	4-15	5-23	2
AR 839-27-1-3	**75.8**	**56.4**	**1**	**36**	**4-18**	**5-26**	**1**
ARMOR 3135	75 6	54 7	2	36	4-13	5-23	1
USG 3709	74 8	52 8	0	35	4-12	5-21	8
PROGENY 103	74 8	54 3	5	34	4-12	5-21	2
SOUTH STATES SS 535	74 6	56 1	6	31	4-13	5-21	0
TERRAL TV 8825	74 1	53 7	9	34	4-13	5-25	1
FFR 510	74 0	54 8	3	34	4-09	5-19	0
ROANE	74 0	56 9	4	31	4-15	5-22	0
CROPLAN GENET SR218	73 8	55 0	3	36	4-17	5-24	6
AR 494B-2-2	73 7	54 5	5	35	4-15	5-24	2
SOUTH STATES SS 518	73 6	53 4	17	31	4-07	5-18	0
SOUTH STATES SS 522	73 4	56 0	3	33	4-12	5-22	0
DELTA KING 9027	73 3	53 6	3	33	4-13	5-21	1
DIXIE 2000	72 0	53 7	6	33	4-13	5-22	0
SABBE	72 0	53 6	1	34	4-15	5-25	13
VA 96W-270	71 8	55 5	1	32	4-09	5-19	0
AR 584A-3-1	71 7	55 1	16	37	4-12	5-21	2
CROPLAN GENET SR204	71 6	55 8	8	36	4-16	5-24	1
FFR 551	70 7	53 9	4	31	4-12	5-22	0
DIXIE 911	70 5	53 2	2	33	4-14	5-23	0
TERRAL TV8910	70 5	52 8	1	34	4-13	5-22	0
DELTA KING 9121	70 5	54 1	2	32	4-14	5-21	0
SOUTH STATES SS 516	70 5	55 8	0	31	4-09	5-19	0
DELTA GROW 4888	70 3	55 6	7	38	4-16	5-24	1
AGRIPRO SHILOH	69 8	54 2	3	33	4-15	5-21	40
NK COKER 9543	69 3	53 6	10	31	4-12	5-20	1
AGRIPRO PATTON	68 8	52 7	5	34	4-13	5-22	0
Grand mean	74 6	54 8	4	34	4-12	5-22	3
LSD (5%)	4 2						
C V (%)	10 6						

Ldg = Lodging Pt ht = Plant height

Table 2. 2000-01 Grain yield expressed as bu/A averaged across test locations within a State*.

	Arkansas			Mississippi	Louisiana
	Standard	High	Average		
Pioneer 26R38	74.1	84.0	79.0	86.8	92.0
AR 839-27-1-3	**68.1**	**78.5**	**73.3**	**82.5**	**87.8**
Delta King 1551W	70.3	77.1	73 7	78.2	88.4
AGS 2000	71.7	80.4	76.0	74.0	84.4
Agripro Natchez	67.2	74 9	71 1	71.1	87.1
Agripro Mason	66.9	72.0	69.5	75.8	76.5

*Arkansas- Data for standard test were averaged over four locations; Data for High input test averaged over three locations. Data for Mississippi and Louisiana averaged over five locations.

2). YIELD NURSERIES

The most advanced experimental lines were tested in the Elite Wheat Lines (EWL) nursery at Keiser, Stuttgart, Marianna. The average of the experimental lines over all three locations is presented in Table 3. AR 850-1-1 and AR 910-9-1 which were among the highest yielding lines in the test are being tested in the Variety Test this fall and have been entered in the Uniform Nurseries to be tested in the whole soft wheat region For the Advanced Wheat Strains nursery there were several experimental lines that had higher yields than NK Coker 9663 (Table 4). These lines were advanced to the Elite test for further testing.

The White Wheat Trials are conducted at Keiser and the results are presented in Table 5. There were several white wheats that had grain yields higher than the red seeded soft wheat, indicating that white wheat can obtain comparable yields as the red seeded varieties.

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 6. The results for the Wheat Rust evaluation nursery are presented in Table 7.

Table 3. Average performance across 3 locations* in the Elite Wheat test in 2001.

Entry	Yield	Test Wt	Lodge	Head	Pl Ht	Mature	SLB†	Stress††
SHELBY	80.5	58.9	9.5	419	28	525	2.00	2 00
AR850-1-1	80.3	59.4	2.0	421	30	524	1.00	13.00
AR910-9-2	78 7	56.8	4.8	418	33	523	2.00	2 00
AR839-27-1-3	**77.9**	**59.0**	**0.3**	**421**	**31**	**528**	**7.00**	**3.25**
AR910-9-1	77.7	57.5	4.9	418	30	523	2.00	4.50
AR94194-2-3	75 2	57.5	1.8	418	29	523	0.50	7.75
AR910-12-1	74 9	57.3	21.0	417	31	522	0.50	4.50
COKER9663	73.6	59.6	6.3	419	31	524	2.00	3.25
AR763-6-2-1	72.1	58.3	0.0	418	28	524	1.00	3.25
AR584A-3-1-3	71.7	56 6	21.2	417	28	521	2.00	4.50
AR800-1-3-1	71.4	58 1	0.4	419	30	529	0.50	15.00
AR763-6-4-1	71.1	58.4	0 4	418	28	524	2.00	11.75
HAZEN	70.6	57 9	1 6	418	28	522	7.00	5.75
AR717-4-4-1	70 4	55.8	0.4	417	27	522	2.00	15.00
AR771-13-3-1	70.0	55.3	1.5	423	32	531	1.00	5.75
FFR 522W	69 7	59.2	4.3	417	26	520	2.00	15.50
AR-LA85411	69.7	58 7	1 1	417	29	521	4.50	5.75
AR803-1-1-1	69 3	57.1	4.2	419	31	525	0 50	2.00
AR93157-3-1	69.1	56.0	10 5	423	30	528	4.50	2 00
AR777-6-4-1	68 7	56 9	2.0	419	33	527	3.25	7 00
AR771-14-5-1	68 5	54.2	2.2	423	28	529	2.00	4 50
AR494B	67 9	56.7	9.5	423	30	528	2 00	4.50
AR690-3-2-1	67.8	58 3	16.9	420	33	530	0.50	5.75
AR800-1-2-1	67.8	58 5	2.0	419	32	525	0.50	15.00
AR773-3-3-2	67.0	56.0	4.5	425	34	535	2.00	2.00
AR93157-4-1	66.9	56.4	15.3	424	31	528	4.50	2.00
AR793-1-2-4	66 7	57 6	4.7	421	31	529	2 00	3.25
AR584A-3-1	66.6	56.9	20.8	418	38	521	3.25	5.75
AR800-1-1-1	66.4	59 2	3.8	421	33	526	0.00	15.00
SABBE	66.3	55.4	2.1	421	27	527	1.00	3.25
AR771-16-1-2	66 2	53.2	5 8	423	29	528	2.00	7.00
AR771-14-2-2	65 2	54.0	11 8	423	31	531	2.00	5.75
AR810-2-3-1	64 8	58.0	12 5	421	32	529	1 50	2.00
AR93139-3-1	64.4	53 4	9.8	421	29	527	0 00	3.25
AR793-1-3-2	64.3	56.1	5.4	420	31	527	2.00	2.00
AR926-2-1	61 6	57.9	22 5	417	26	522	13 00	41.25
ROANE	60 4	58.1	2 2	417	26	523	15 00	13.00
JAYPEE	59 6	57.5	16 1	415	25	520	15.00	50.00

*Keiser, Marianna, and Stuttgart
†Septoria Leaf Blight
††Fusarium root rot and crown rot

Table 4. Average yield of Advanced Wheat Strains over two Locations*

	yield bu/A	testwt lb/bu	lodg	head	plht	mat
AR93035-4-1	79 1133	57 0873	0 8	408 75	35 0000	523
AGS2000	78 3439	56 0551	3 4	412 50	34 6667	521
AR93006-2-1	75 1996	54 7494	2 6	411 75	34 6667	526
AR95156-2-1	75 0010	56 5947	3 2	412 00	37 0000	520
AR93027-4-1	74 9995	55 4503	2 2	411 75	37 3333	525
AR93113-2-2	74 8503	56 8036	6 6	412 50	32 6667	522
AR93173-3-1	74 6663	56 8643	5 0	415 75	33 0000	524
AR93002-3-3	73 7506	57 4894	3 6	411 75	36 0000	525
AR95155-5-2	73 5599	55 3695	2 4	413 00	32 6667	527
Coker9663	73 0107	56 1587	9 0	412 25	37 3333	522
AR93189-4-1	72 9682	56 5657	3 6	414 00	33 6667	522
AR93027-1-2	72 5710	56 4243	7 2	413 75	37 0000	524
AR93052-1-1	72 5527	55 7151	8 0	416 75	39 0000	528
AR93124-1-1	72 3628	56 2045	5 0	412 50	37 6667	522
AR93146-3-3	72 2488	56 3481	21 6	412 75	35 3333	523
AR93027-5-1	71 9365	55 8124	2 6	411.25	35 0000	521
AR93025-2-1	71 5301	57 3444	5 2	409 25	38 0000	522
AR95155-6-1	71 0896	55 5823	5 6	412.25	39 0000	525
AR93084-5-1	71 0589	55 4233	11 2	412 00	37 0000	520
AR93092-4-1	71 0414	55 4128	3 6	412 00	37 3333	520
AR93027-5-3	70 7225	55 8049	1 0	408.25	35 3333	521
AR93137-13-2	70 6016	55 9396	2 2	410 50	30 6667	523
AR93027-3-2	70 5374	56 1275	1 6	411 50	35 0000	521
AR93048-5-1	70 3794	55 4104	3 4	410 25	35 6667	520
AR93173-3-3	70 0006	56 8536	3 8	415.25	31 6667	524
AR93027-1-3	69 7850	55 3463	7 6	412 25	37 6667	521
AR93061-7-1	69 4920	53 6976	3 0	411.25	33 6667	522
AR93027-1-1	69 4423	56 7440	2 8	412 25	36 0000	522
AR93002-3-2	68 9432	56 6098	3 8	413 75	34 0000	524
AR93017-1-1	68 8916	55 7843	3 0	412 50	37 6667	521
AR93017-7-2	68 7116	56 3432	3 6	412 50	37 3333	524
AR93034-5-1	68 6262	54 5934	1 8	413 50	36 3333	520
AR494	68 3407	56 0355	11 0	412 50	38 0000	525
AR93051-3-1	68 1948	55 9382	5 6	414 00	36 0000	525
AR93061-5-1	68 1028	55 6449	1 6	413 75	35 0000	524
AR95155-1-1	68 0532	55 3865	3 0	413 00	31 3333	526
AR93002-2-3	68 0266	56 2372	6 8	412 75	33 3333	520
AR93188-11-1	67 9560	57 1019	1 0	413.25	34 6667	523
AR93016-2-3	67 7953	55 8152	4 4	412.25	36 3333	522
AR93094-7-1	67 6837	55 3664	3 0	413 25	33 6667	521
AR93009-1-1	67 5127	56 1231	5 0	413 00	34 0000	523
AR93027-2-1	67 3463	56 5879	2 0	412 50	34 6667	522
AR93051-4-1	67 2813	56 5962	6 4	412.25	35 6667	526
AR93027-5-2	67 0326	55 3702	1 6	412 00	35 0000	520
AR93002-3-1	66 9831	57 3912	3 2	412 75	34 6667	523
AR93027-4-3	66 9803	57 4227	4 0	412 75	34 3333	522
AR93027-2-2	66 6612	56 2597	1 8	409 50	34 6667	524
AR93223-7-1	65 8452	57 2769	5 4	412 25	39 3333	521
AR93223-8-1	65 4031	53 6377	3 2	410 25	35 3333	522
Sabbe	65 1904	55 2795	3 0	413 75	35 6667	528
AR93107-3-1	65 1578	55 4017	5 8	411 00	35 3333	521
AR95149-3-1	65 0707	55 5149	4 0	411 50	34 0000	522
AR93173-7-1	64 4058	53 5539	3 2	411 75	34 3333	523
AR93078-1-2	64 3938	55 3540	10 6	414 25	37 0000	523
AR93146-5-1	64 0500	56 9282	4 0	415 25	32 3333	526
AR93047-3-1	62 2677	54 2319	2 2	411.25	35 6667	520
AR93180-1-1	61 8685	56 0634	2 4	414 00	34 0000	523
AR93094-7-2	60 3939	54 7312	3 0	410 75	32 3333	522
AR93042-3-1	59 7850	54 6074	1 4	410.25	30 3333	518
AR93017-5-2	59 1138	52 5541	2 8	412 50	30 3333	524

*Keiser and Stuttgart

Table 5. White Wheat Yields at Keiser for the 2000-2001 growing season.

	yield bu/A	testwt lb/bu	lodg	head	plht	mature
PIONEER25W33	51.7574	55.6824	3 75	424	27	526
NY870048W-7388	50 9016	57 8497	5 00	505	32	604
PIONEER25W60	44.7312	56 1757	12.50	424	28	525
BETTY	41 8992	59 5854	17 50	427	30	526
AR839-10-1-1	41.8763	56.8806	5.00	429	31	529
AR494B-2-2	41 6477	58.5105	13 75	429	31	530
NY84214-82	41.6444	57.3035	12 50	429	30	531
HEYNE	41.6379	59 1449	11.25	430	27	529
COKER9663	39.8054	58 0083	11 25	425	31	523
GENEVA	37 9957	57 9643	11.25	430	28	528
JAYPEE	36.0718	59 4180	13.75	421	26	520
ROANE	33 8342	59 4533	6 25	423	25	526

Table 6. Results of the Head Blight Nursery at Stuttgart for the 2000-2001 growing season.

	yield bu/A	testwt lb/bu
AR93095-4-1	84 9153	57 6916
AR93187-6-1	82 5765	58 0793
AR93108-8-1	78 9180	55 0837
AR93035-4-2	78 0949	58 9604
AR93035-4-4	76 8798	59 3833
AR93035-7-1	76 7752	58 5022
AR839-27-1-3	76 6838	58 1145
SABBE	74 4234	56 1410
AR93035-4-3	74 0053	59 6300
AR93188-1-1	72 7640	57 8678
AR93189-3-1	72 6464	58 6432
AR93108-4-1	72 6203	57 8326
AR93108-9-1	72 2936	55 9295
AR93035-4-1	71 8102	59 4890
AR880-5-1	71 7318	57 4802
AR93188-12-1-1	71 2614	58 3612
AR93189-7-1	71 2092	58 5374
AR93032-6-1	70 9870	57 3040
AR93058-1-1	70 8956	58 2555
AR93104-4-1	70 7649	59 1718
AR93189-7-2	70 6081	58 2203
AR93081-2-1	70 1378	57 9031
AR93189-4-1	69 9940	58 4670
AR93035-1-1	69 9287	58 5374
AR93108-8-2	69 5629	55 8943
AR93069-5-1	69 2885	61 1806
AR93108-3-2	69 1186	57 5154
MO94-317	68 6090	56 0352
ROANE	68 2693	58 3612
AR93019-2-1	67 3155	57 8678
AR93052-1-1	67 1718	56 6696
AR93187-4-2	67 0281	58 6079
AR93108-1-2	66 8713	58 2555
AR93081-2-2	66 7276	57 9031
AR93188-7-1	66 7145	58 0088
AR93048-8-2	66 4793	57 3392
AR93186-8-1	66 0351	57 6916
AR93053-1-1	65 7737	59 4890
AR878-2-1	65 2772	58 9604
AR908-8-1	65 1596	57 2335
AR93187-3-2	64 8461	58 0088
AR93188-11-1	64 7546	57 5154
AR93079-6-1	64 4149	55 5771
AR912-3-2	64 3496	57 3392
AR908-8-2	64 3365	56 4581
AR93075-3-1	63 9184	59 7004
AR93104-5-1	62 3243	58 8194
AR93108-1-4	61 6188	57 8678
AR93048-9-1	61 5927	56 0352
AR922-5-1	61 4620	60 3348
AR93048-10-1	60 5212	56 5991
AR93048-10-2	59 8680	56 6696
AR93048-8-1	59 8418	56 3172
AR93048-4-3	59 2408	55 5066
AR93108-1-3	59 2016	57 6564
AR93052-4-1	59 1363	59 9824
AR93001-3-1	59 0187	57 6564
AR93104-7-1	58 7966	58 3612
AR93048-4-2	58 5744	56 6344
AR93048-5-1	58 4568	56 9515
AR93048-7-1	58 1302	56 3172
AR93074-11-4	57 5553	59 0661
AR857-1-1	56 6296	58 3965
AR93001-3-2	55 7783	58 9604
AR93053-2-1	55 6215	56 6696
ERNIE	53 4676	58 0441
AR93091-4-1	52 1721	58 2203
AR858-3-1	52 1460	57 4097
AR858-9-1	49 8072	56 9515
AR927-5-2	49 4283	55 7885
AR93116-5-1	49 0102	56 9868
AR93091-6-1	48 1609	57 8678
AR857-1-2	47 5729	58 4317
AR927-5-1	46 6191	54 6608
AR93091-4-2	39 0409	59 4890

Table 7. Results of the Wheat Rust Evaluation Nursery for 2000-02 growing season.

	yield bu/A	testwt lb/bu	head	plht	mat
AR872-8-1	85.8691	55.6828	417.0	30	519.5
AR93005-6-1	83.4192	58 2026	421.5	31	519.5
COKER9663	83.1318	59 3480	422.5	32	525.5
AR93005-6-4	82.0996	58.0088	422.0	29	522.0
AR93004-1-1	80.6427	58.5257	422.5	29	523.0
AR93005-6-5	80.6035	57.9736	418.0	29	518.0
HAZEN	78.1275	57.7269	422 0	30	521.5
AR93110-9-4	75.5536	56.6872	422.5	33	524.0
AR876-5-1	75.1812	53.5330	424.5	27	523.0
ARLA85411	74.9852	58 1145	421.0	30	517.5
SABBE	74.9721	56.1586	423.0	32	521.5
AR93110-9-2	74.8937	56.2115	419.0	32	520.5
AR876-5-3	73.9073	52.8987	424.0	26	524.0
AR93005-1-1	73.1429	56.5991	422.5	30	518.5
AR93094-7-1	72.2806	56.4229	420 0	29	518.5
AR93094-7-2	72.2718	56.5286	418.0	28	518.0
AR93039-6-1	71.8559	55.7357	427.0	34	526.5
AR908-8-1	71.7514	55.8238	430.0	31	530.0
AR93094-9-1	70.6669	56.9692	418.5	27	518.0
AR95151-2-2	69.6412	57.3510	420.5	33	522.0
AR93127-1-2	69.2231	53.6564	424.0	32	524.5
AR95151-1-1	68.4065	57.6035	421.0	30	519.0
AR93021-1-1	68.3216	57.1278	422.5	27	520.5
AR93005-6-2	68.2105	58 0441	422.0	30	522.0
AR93039-1-1	67.6030	56 0881	427 0	31	527.5
AR928-5-1	67.4788	56.0352	417.0	29	518.0
AR908-8-2	65.9501	51.4714	429.0	32	525.5
AR93127-3-1	64.4541	56.2996	416.0	29	516 5
AR93127-10-1	64.4149	57.0396	423 0	30	523.0
AR876-2-1	63.2586	56.4053	427.0	25	526.5
AR872-1-1	60.9132	57.7445	426.0	38	533.5
AR928-8-2	57.2874	54.5903	419.5	30	533.0
AR872-1-2	56.4708	54.9956	416.0	39	533.0
AR928-8-4	49.9313	53.3040	432.5	29	533.5

3) EARLY GENERATIONS

Crosses were made in the greenhouse in the spring between good parental lines. The resulting offspring (F_1) of last years crosses were grown in the greenhouse over the winter. The next three generations (F_2, F_3, and F_4) were grown as bulk populations in the field at Stuttgart. Individual plants were selected from the F_6 generation to produce experimental lines which were planted at Stuttgart and Keiser this fall to begin yield testing.

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 near 20,000 new lines were evaluated in the field. In order to produce new experimental lines, over 900 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:

➜ New variety 'AR 839-27-1-3' released and Foundation Seed sold.

➜ AR 494B-2-2 released as Armor 3235 through a marketing agreement with Cullum Seeds.

➜ Breeder seed of ARLA 85411 produced for release in summer 2002.

➜ Four new lines advanced to State Variety Trials and Regional Nurseries.

➜ Breeding project under way for the development of herbicide-tolerant wheat for Hoelon-resistant ryegrass.

➜ Four scab resistant lines advanced for regional testing.

➜ Work in developing speciality wheat for Arkansas continues.

BUDGET REQUEST

		AWPB	AAES
PERSONNEL:			
Salaries -	Project Leader	-	60,000
	Sr. Research Associate (25%)	11,266	33,798
	Research Associate (50%)	18,797	18,797
	Research Specialist (25%)	4,500	13,500
Wages (1800 hr @ $6)		10,800	-
Fringe Benefits($33,688 @ 23.45%)		8,105	29,569
	($10,800 @ 0.21%)	23	-
Total Personnel		53,491	155,664
TRAVEL:			
Instate			
Per Diem (100 days @$50)		5,000	-
Vehicle		-	2,000
Out of state (Evaluate lines in Louisiana)		250	5,000
Total Travel		5,250	7,000
EQUIPMENT:			
Depreciation			6,000
MAINTENANCE/OPERATIONS:			
Expendable Supplies		2,500	-
Fertilizer/Chemicals		2,500	-
Fuel		2,500	-
Computer Supplies		500	800
Greenhouse and Growth Chamber Fees		1,500	1,500
Equipment Repairs		2,000	-
Breeder Seed Production		1,000	1,000
Total Maintenance/Operations		11,500	3,300
OFF CAMPUS RESEARCH ALLOCATIONS:			
Keiser		500	2,000
Kibler		300	1,000
Stuttgart		500	2,000
Marianna		400	1,000