

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

and

Cooperating State Agricultural Experiment Stations

2005-06

UNIFORM WINTER BARLEY TRIAL

Final Report

Coordinator: David Marshall/Myron Fountain

This is a joint progress report of cooperative investigations underway in the Agricultural Research Service of the U. S. Department of Agriculture and the State Agricultural Experiment Stations containing preliminary data which have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. This report is primarily a tool for use by cooperators and those persons having direct and special interest in the development of agricultural research programs. This report includes data furnished by the State Agricultural Experiment Stations and is not intended for publication and should not be referred to in literature citations or quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

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The purpose of the Uniform Winter Barley Trial (UWBT) is to evaluate winter-habit (fall planted) advanced lines of barley for adaptation to those areas in the United States where winter barley is grown commercially. Twenty-one entries were submitted by public/private barley breeding programs of Cargill, MD, NE, NC, TX, and VA in the 2005-06 UWBT. Ten testing locations were used for the 2005-06 UWBT; with one in each state of Georgia, Maryland, Nebraska, and Texas; with two in each state of North Carolina, South Carolina, and Virginia.

Griffin, GA - Plot size-50ft²; Reps-3; Planting date-26 Oct 05; Harvest date-5 Jun 06; Cooperators-J.W.Johnson & James Buck

Queenstown, MD - Dry spring, had to regrow after geese damage and some plots were thin. Plot size-36ft²; Reps-2; Planting date-20 Oct 05; Harvest date-15 Jun 06; Cooperators-J.Costa & A.Cooper

Mead, NE - Dry year with minimal winter injury in wheat or triticale. Plot size-32ft²; Reps-3; Planting date-26 Sep 05; Harvest date-22 Jun 06; Cooperator-P.S.Baenziger

rust infestations. 120 total N/a; Harmony GT and Warrior; Plot size-55ft²; Reps-2; Planting date-21 Oct 05; Harvest date-31 May 06; Cooperators-D.Marshall & Myron Fountain

Laurel Springs, NC - Winterkill nursery location in mountain region (elevation 3000ft); mild temperatures during most of winter, no winterkill. Plot size-10ft²; Reps-1; Planting date-8 Nov 05; Harvest date-15 Jul 06; Cooperators-D.Marshall & Myron Fountain

Clemson, SC - Cooperator-B.Edge

Florence, SC - Cooperator-B.Edge

Prosper, TX - Not harvested due to poor stands and drought; Cooperator-R.Sutton

Blacksburg, VA - Plot size-45ft²; Reps-3; 25+80+80 lbs/a preplant; 78 lbs N/a applied on 27 Mar 06 (total N/a=103 lb); 0.6 oz/a Harmony Extra applied on 27 Mar 06. Planting date-14 Oct 05; Harvest date-15 Jun 06; Cooperator-C.Griffey & Wynse Brooks

Warsaw, VA - Plot size-45ft²; Reps-3; 30+60+60 lbs/a preplant; 27 lbs N/a (+S) applied on 13 Dec 05; 30 lbs N/a (+S) applied on 27 Feb 06; 45 lbs N/a (+S) applied on 4 Apr 06 (total N/a=132 lb); 0.4 oz/a Finesse applied on 13 Dec 05; 2.56 oz/a Warrior applied on 28 Apr 06; Planting date-19 Oct 05; Harvest date-17 Jun 06; Cooperator-C.Griffey, Wynse Brooks, Mark Vaughn & Bob Pitman

2005-06 Uniform Winter Barley Trial						
Entry	Designation	Traits	Pedigree	Origin	Seed Source	Yrs in Trial
1	Wysor		Composite cross/4/Harrison/3/Cebada Capa/Wong//awnleted Hudson (=PI501526; VA83-42-63)	VA	ARS	18
2	Perkins		Nebar selection/Dundy (=PI536646; NE851808)	NE	ARS	8
3	Price		Callao/SC830366 (=PI632708; VA96-44-321)	VA	ARS	3
4	Cargill 26		unknown	Cargill	Cargill	1
5	Cargill 27	2-row	unknown	Cargill	Cargill	1
6	MD931043-25		VA90-41-14/MD811064-33	MD	MD	2
7	MD931046-38		GA82-594/MD45-59-32	MD	MD	2
8	MD931046-93		GA82-594/MD45-59-32	MD	MD	2
9	NE98919		NE86841/Sussex 9024//NE83826	NE	ARS	3
10	NB018199		NB94723/NB93727	NE	ARS	2
11	NC99-1253		Mollybloom/CMB83A-173-43Y-2B-1Y-1B-04	NC	ARS	2
12	NC00-592		Mollybloom/CMB83A-173-43Y-2B-1Y-1B-04//VA92-42-46	NC	ARS	2
13	VA04B-180		VA97B-416//VA96-41-25/VA96-44-307	VA	VA	1
14	Doyce	hulless	Sangregado"S"/VA90-42-56/VA90-42-22/3/Pamunkey/4/SC890585 (=PI634932; VA00H-137) (hulless)	ARS	ARS	3
15	TX00D639	hulless	TAMBAR 500/Clayton//TAMBAR402/PI176071 (hulless)	TX	ARS	3
16	TX00D664	hulless	TAMBAR 402*2/CI5823//PI190762 (hulless)	TX	ARS	4
17	VA01H-1	hulless	H585/Pennbar 66 (hulless)	VA	VA	2
18	VA01H-68	hulless	SC860974/94-42-13 (hulless)	VA	VA	3
19	VA00H-125	hulless	90-41-10/90-42-9//CMB84A-1664/3/92-42-46/4/SC871077/5/SC871077/4/90-41-10/90-42-9//CMB84A-1664/3/Nomini (hulless)	VA	VA	3
20	VA03H-61	hulless	96-41-17/SC872143 (hulless)	VA	VA	1
21	VA04H-53	hulless	H-585/95-41-33 (hulless)	VA	VA	1
Seed Requirements: GA-200g; MD-150g; NC-150g; NE-150g; SC-300g; TX-150g; VA-500g; USDA/ARS-460g; WA-50g = 2,110g total						

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2005-06 Uniform Winter Barley Trial																		
Means across locations																		
			Yield		TW	Heading	Height	Lodging	Leaf Rust	Net Blotch	Hessian Fly	Winter Survival	Flour Protein	β-glucan	FN	KH	KW	KD
Entry	Designation	Traits	bu/a	rank	lb/bu	Julian	in	0-9	0-9	0-9	0-9	%	%	%	sec	score	mm	mm
13	VA04B-180		118.7	1	48.9	110	29	3	4	2	4	100	14.3	6.02	516	68	30.18	2.17
8	MD931046-93		111.3	2	46.1	111	34	3	2	5	1	80	14.7	6.01	594	82	27.25	2.01
6	MD931043-25		110.1	3	48.3	109	31	5	2	5	4	93	15.0	5.08	515	71	28.14	2.11
3	Price		107.7	4	48.9	111	32	3	3	5	4	100	15.0	6.28	535	73	28.43	2.14
1	Wysor		104.7	5	46.5	111	37	4	4	6	5	100	14.2	5.50	543	70	30.17	2.03
7	MD931046-38		104.0	6	47.2	111	34	3	2	5	3	67	14.5	5.35	537	80	28.21	2.05
10	NB018199		103.6	7	45.5	118	38	4	4	5	5	100	14.4	6.05	534	82	28.66	2.04
12	NC00-592		100.2	8	48.4	113	33	3	3	2	5	90	16.1	4.88	562	77	30.00	2.17
20	VA03H-61	hulless	93.3	9	62.0	113	33	3	3	2	5	97	14.8	5.38	504	74	30.32	2.09
9	NE98919		93.0	10	42.6	110	38	4	5	4	3	100	14.3	5.43	517	80	28.80	2.00
14	Doyce	hulless	90.5	11	57.4	110	33	2	2	6	6	88	14.4	5.13	468	60	29.37	1.97
2	Perkins		90.5	12	48.3	119	36	3	3	3	4	100	15.4	6.45	530	84	27.17	2.01
21	VA04H-53	hulless	88.7	13	59.7	114	34	4	4	3	3	97	14.3	5.32	464	64	31.10	1.96
11	NC99-1253		88.2	14	48.0	113	32	3	1	3	6	27	16.4	6.00	535	73	27.59	2.18
18	VA01H-68	hulless	85.7	15	57.4	109	33	3	3	4	4	97	15.0	5.03	452	59	34.05	2.24
4	Cargill 26		84.8	16	47.5	113	31	4	4	5	1	10	13.3	4.88	452	76	30.50	2.10
17	VA01H-1	hulless	81.5	17	58.5	109	33	2	4	5	5	100	14.7	4.96	466	73	29.54	2.00
19	VA00H-125	hulless	80.5	18	59.4	108	29	3	4	4	3	97	15.0	5.65	485	80	27.29	1.97
5	Cargill 27	2-row	78.8	19	46.2	119	32	1	2	5	3	63	15.0	4.70	398	71	40.51	2.46
16	TX00D664	hulless	75.2	20	58.5	108	34	2	6	6	5	95	15.4	4.91	505	73	27.43	1.92
15	TX00D639	hulless	68.0	21	57.7	114	40	6	4	5	3	100	14.9	5.01	524	70	27.16	1.83
Number of locations			5		5	6	6	3	3	1	1	1	7	7	7	7	7	7
	Mean		93.3		51.6	112	33	3	3	4	4	86	14.8	5.43	507	73	29.60	2.07
	CV (%)		16.0		4.3	2	6	34	43	13	27	9	4.1	10.89	12	7	5.87	4.24
	LSD(0.05)		18.8		2.8	2	2	2	2	2	2	11	0.6	0.63	64	6	1.84	0.09

GRAIN YIELD																						
																	5-location*	5-location*	5-location*			
			Griffin.GA		Queenstown.MD		Mead.NE		Kinston.NC*		L'Springs.NC*		Blacksburg.VA		Warsaw.VA		mean	hulled mean	hulless mean			
Entry	Designation	Traits	bu/a	rank	bu/a	rank	bu/a	rank	bu/a	rank	bu/a	rank	bu/a	rank	bu/a	rank	bu/a	rank	bu/a	rank	bu/a	rank
1	Wysor		83.6	11	100.2	4	87.9	6	62.2	6	131.5	5	164.3	2	87.3	14	104.7	5	104.7	5		
2	Perkins		81.1	17	53.4	21	107.0	4	51.1	15	87.3	12	114.6	14	96.2	8	90.5	12	90.5	10		
3	Price		103.2	2	86.2	13	93.4	5	76.0	2	136.0	3	153.1	6	102.7	7	107.7	4	107.7	4		
4	Cargill 26		88.8	7	68.1	16	26.0	20	42.2	19	70.9	17	129.3	10	111.9	3	84.8	16	84.8	12		
5	Cargill 27	2-row	82.5	15	55.1	20	71.1	14	85.2	1	136.6	2	92.3	21	92.9	12	78.8	19	78.8	13		
6	MD931043-25		93.0	5	106.1	1	109.7	3	55.0	11	105.9	8	138.1	8	103.6	4	110.1	3	110.1	3		
7	MD931046-38		97.9	4	103.7	3	71.5	13	64.6	5	134.0	4	143.8	7	103.1	6	104.0	6	104.0	6		
8	MD931046-93		103.6	1	105.5	2	81.1	8	58.7	7	89.4	11	162.7	3	103.4	5	111.3	2	111.3	2		
9	NE98919		70.6	20	89.6	11	84.5	7	51.6	13	147.3	1	130.7	9	89.5	13	93.0	10	93.0	9		
10	NB018199		85.2	9	90.5	9	111.3	1	50.8	16	71.3	15	116.7	13	114.5	1	103.6	7	103.6	7		
11	NC99-1253		81.0	18	75.5	15	34.3	19	76.0	3	117.6	6	155.1	5	95.3	10	88.2	14	88.2	11		
12	NC00-592		88.9	6	93.7	7	67.8	15	54.1	12	92.7	10	156.0	4	94.4	11	100.2	8	100.2	8		
13	VA04B-180		101.0	3	90.1	10	111.0	2	57.4	8	110.2	7	177.2	1	114.0	2	118.7	1	118.7	1		
14	Doyce	hulless	88.6	8	86.6	12	80.6	9	55.3	10	45.3	20	112.4	15	84.4	15	90.5	11			90.5	2
15	TX00D639	hulless	47.3	21	67.1	18	61.9	16	48.6	18	44.6	21	99.9	19	63.7	21	68.0	21			68.0	8
16	TX00D664	hulless	74.7	19	77.7	14	58.9	17	39.8	21	64.7	19	99.7	20	65.2	20	75.2	20			75.2	7
17	VA01H-1	hulless	83.2	14	67.6	17	71.8	11	51.2	14	71.2	16	110.6	17	74.5	18	81.5	17			81.5	5
18	VA01H-68	hulless	83.4	13	91.2	8	57.7	18	42.0	20	65.9	18	121.3	11	75.0	17	85.7	15			85.7	4
19	VA00H-125	hulless	85.0	10	65.6	19	18.5**	21	65.9	4	104.9	9	104.9	18	72.1	19	80.5	18			80.5	6
20	VA03H-61	hulless	82.5	16	99.3	5	71.5	12	50.3	17	77.8	14	117.6	12	95.6	9	93.3	9			93.3	1
21	VA04H-53	hulless	83.6	12	96.0	6	73.7	10	56.0	9	85.1	13	111.7	16	78.5	16	88.7	13			88.7	3
	Mean		85.2		84.2		73.9		56.8		94.8		129.1		91.3		93.3		99.7		82.9	
	CV (%)		11.6		9.5		15.5		27.9				7.5		8.3		16.0		17.0		9.4	
	LSD (0.05)		16.3		16.8		15.7		33.0				16.2		12.5		18.8		21.5		10.1	
* mean does not include NC locations																						
** "Unsure of reason for low yield, matured early with possible shatter loss, but did not note such." Missing data during analysis.																						

TEST WEIGHT														
			Griffin	Q'town	Kinston	L'Springs*	B'burg	Warsaw	5-location*		6-location		5-location*	
			<u>GA</u>	<u>MD</u>	<u>NC</u>	<u>NC</u>	<u>VA</u>	<u>VA</u>	<u>mean</u>		<u>hull mean</u>		<u>hulless mean</u>	
Entry	Designation	Traits	lb/bu	lb/bu	lb/bu	lb/bu	lb/bu	lb/bu	lb/bu	rank	lb/bu	rank	lb/bu	rank
1	Wysor		48.8	43.3	48.4	48.7	47.8	44.1	46.5	17	46.9	10		
2	Perkins		52.1	44.4	53.8	51.1	49.4	41.9	48.3	12	48.8	3		
3	Price		48.6	48.8	50.3	49.6	48.6	48.4	48.9	9	49.1	1		
4	Cargill 26		47.7	46.2	50.1	50.8	46.8	46.9	47.5	15	48.1	6		
5	Cargill 27	2-row	48.9	40.6	52.7	50.6	44.8	44.1	46.2	18	47.0	9		
6	MD931043-25		49.2	47.6	50.5	48.2	47.7	46.6	48.3	13	48.3	5		
7	MD931046-38		49.6	48.8	49.4	50.8	46.9	41.3	47.2	16	47.8	8		
8	MD931046-93		49.2	43.6	49.0	48.9	46.6	42.0	46.1	19	46.6	11		
9	NE98919		45.8	41.2	45.2	46.3	42.3	38.7	42.6	21	43.3	13		
10	NB018199		50.2	44.9	49.8	48.5	43.5	39.0	45.5	20	46.0	12		
11	NC99-1253		49.3	45.4	49.3	48.4	49.0	46.8	48.0	14	48.0	7		
12	NC00-592		50.2	48.2	49.6	50.5	48.6	45.3	48.4	11	48.7	4		
13	VA04B-180		47.6	49.0	50.2	49.4	49.1	48.7	48.9	10	49.0	2		
14	Doyce	hulless	58.2	54.8	58.5		58.7	56.9	57.4	7			57.4	7
15	TX00D639	hulless	59.7	53.1	58.3		59.7	57.5	57.7	6			57.7	6
16	TX00D664	hulless	57.1	57.0	60.4	58.8	59.9	58.1	58.5	4			58.5	4
17	VA01H-1	hulless	58.8	54.9	59.8	58.9	60.5	58.4	58.5	5			58.5	5
18	VA01H-68	hulless	60.6	57.7	49.4	60.4	61.6	57.5	57.4	8			57.4	8
19	VA00H-125	hulless	60.1	57.1	61.6	58.4	60.0	58.3	59.4	3			59.4	3
20	VA03H-61	hulless	62.4	59.1	64.0	60.9	63.2	61.3	62.0	1			62.0	1
21	VA04H-53	hulless	60.6	57.1	61.0	59.2	60.2	59.4	59.7	2			59.7	2
	Mean		53.1	49.6	53.0	52.5	52.1	49.6	51.6		47.5		58.8	
	CV (%)			3.8	7.0		1.7	1.8	4.3		3.9		3.5	
	LSD (0.05)			3.9	8.0		1.5	1.5	2.8		2.1		2.7	
* mean does not include Laurel Springs, NC location														

		DAYS TO HEADING (JULIAN)							HEIGHT (in)							LODGING (0-9)				LODGING*	
		<i>Griffin</i>	<i>Q'town</i>	<i>Mead</i>	<i>Kinston</i>	<i>B'burg</i>	<i>Warsaw</i>	<i>6-location</i>	<i>Griffin</i>	<i>Q'town</i>	<i>Mead</i>	<i>Kinston</i>	<i>B'burg</i>	<i>Warsaw</i>	<i>6-location</i>	<i>Griffin</i>	<i>Q'town</i>	<i>Kinston</i>	<i>3-location</i>	<i>B'burg</i>	<i>Warsaw</i>
Entry	Designation	GA	MD	NE	NC	VA	VA	mean	GA	MD	NE	NC	VA	VA	mean	GA	MD	NC	mean	VA	VA
1	Wysor	94	122	132	101	108	106	111	37	39	38	37	41	32	37	1	3	9	4	0.6	2.8
2	Perkins	102	131	138	108	117	118	119	33	39	39	32	39	32	36	1	0	8	3	2.2	0.4
3	Price	95	125	131	102	108	105	111	35	31	32	30	34	28	32	1	1	7	3	1.3	2.3
4	Cargill 26	96	125	137	104	110	106	113	32	34	28	29	33	29	31	3	0	9	4	4.3	1.6
5	Cargill 27	104	128	141	109	117	113	119	34	36	31	29	35	29	32	2	0	2	1	1.1	0.7
6	MD931043-25	94	122	132	99	105	104	109	35	32	33	29	32	24	31	3	3	9	5	5.2	6.2
7	MD931046-38	95	120	135	98	108	108	111	37	37	34	30	36	30	34	3	0	7	3	5.0	0.3
8	MD931046-93	94	121	134	98	108	108	111	36	37	35	31	35	29	34	1	1	7	3	1.5	0.3
9	NE98919	92	124	131	99	108	105	110	41	38	38	36	39	34	38	2	1	9	4	4.9	1.1
10	NB018199	101	128	139	109	116	115	118	39	42	42	29	39	35	38	1	2	8	4	3.3	2.3
11	NC99-1253	97	125	138	104	108	106	113	36	31	30	31	36	29	32	1	0	7	3	0.3	2.0
12	NC00-592	96	125	137	98	111	108	113	31	40	33	29	35	29	33	1	0	7	3	0.3	0.4
13	VA04B-180	96	123	133	99	106	105	110	31	29	31	26	31	25	29	1	1	7	3	0.3	0.7
14	Doyce	95	124	135	92	108	105	110	35	37	33	30	34	29	33	2	1	4	2	2.5	1.2
15	TX00D639	96	127	136	103	111	109	114	38	40	40	38	43	40	40	4	4	9	6	3.1	2.3
16	TX00D664	93	122	131	93	107	103	108	38	37	34	28	34	31	34	1	1	5	2	0.2	0.5
17	VA01H-1	94	123	132	94	108	105	109	38	34	33	28	34	29	33	1	0	6	2	0.2	0.3
18	VA01H-68	93	123	132	97	105	102	109	36	37	35	29	33	30	33	1	1	8	3	0.3	0.9
19	VA00H-125	93	123	130	93	106	102	108	30	26	30	27	31	27	29	1	0	7	3	0.3	0.7
20	VA03H-61	98	124	132	103	112	109	113	33	37	34	30	34	31	33	2	0	7	3	0.4	0.3
21	VA04H-53	98	126	136	103	113	110	114	31	38	37	29	36	30	34	2	1	8	4	3.7	1.2
	Mean	96	124	134	100	110	107	112	35	35	34	30	35	30	33	2	1	7	3	2	1
	CV (%)		1	10	2	4	6	2		4	4	5	4	5	6		104		34	91	45
	LSD (0.05)		3	2	4	1	2	2		3	2	3	3	3	2		2		2	3	1

* Belgian Lodging Scale (0.2-10) = Area x Intensity x 0.2. Area is rated on a scale from 1 (plot unaffected) to 10 (entire plot affected). Intensity is rated on a scale from 1 (plants standing upright) to 5 (plants lying flat on the ground).

DISEASE AND OTHER TRAITS													
		BYDV	Leaf Rust	Leaf Rust	Leaf Rust	Leaf Rust	Leaf Rust	Net Blotch	Hessian Fly	Stalk Breakage	Winter Survival	Early height	Comments
		<i>Q'town</i>	<i>Kinston</i>	<i>Kinston</i>	<i>B'burg</i>	<i>Warsaw</i>	<i>3-location</i>	<i>B'burg</i>	<i>Kinston</i>	<i>Kinston</i>	<i>Mead</i>	<i>Warsaw</i>	<i>Q'town</i>
		<u>MD</u>	<u>NC</u>	<u>NC</u>	<u>VA</u>	<u>VA</u>	<u>mean</u>	<u>VA</u>	<u>NC</u>	<u>NC</u>	<u>NE</u>	<u>VA</u>	<u>MD</u>
Entry	Designation	0-9	%	0-9	0-9	0-9	0-9	0-9	0-9	%	%	in	
1	Wysor		13	3	2	8	4	6	5	5	100	6	
2	Perkins		30	3	3	3	3	3	4	0	100	4	Too late
3	Price		23	2	1	7	3	5	4	0	100	6	
4	Cargill 26	6	50	6	2	3	4	5	1	25	10	6	Uneven stunting
5	Cargill 27	7	1	2	1	3	2	5	3	0	63	5	Uneven heavy stunting
6	MD931043-25		26	3	1	3	2	5	4	5	93	6	
7	MD931046-38		18	3	2	2	2	5	3	0	67	6	
8	MD931046-93		45	4	1	2	2	5	1	0	80	6	
9	NE98919		55	5	4	6	5	4	3	85	100	6	
10	NB018199		50	6	2	5	4	5	5	30	100	6	Mixed
11	NC99-1253		0	1	1	1	1	3	6	0	27	7	
12	NC00-592		25	5	3	2	3	2	5	0	90	6	
13	VA04B-180		28	5	2	6	4	2	4	0	100	6	
14	Doyce		1	3	1	1	2	6	6	0	88	8	
15	TX00D639		23	3	2	8	4	5	3	23	100	6	
16	TX00D664		75	9	4	6	6	6	5	3	95	7	
17	VA01H-1		40	4	2	6	4	5	5	0	100	7	
18	VA01H-68		43	5	2	3	3	4	4	0	97	9	
19	VA00H-125		30	3	4	6	4	4	3	0	97	7	
20	VA03H-61		13	2	2	4	3	2	5	0	97	4	Looked good
21	VA04H-53		35	5	2	6	4	3	3	0	97	6	
	Mean		30	4	2	4	3	4	4	8	86	6	
	CV (%)		79	57	47	25	43	13	27	172	9	11	
	LSD (0.05)		48	4	2	2	2	2	2	30	11	1	

FLOUR PROTEIN PERCENT*															
			<u>Q'town</u>	<u>Kinston</u>	<u>L'Springs</u>	<u>Clemson</u>	<u>Florence</u>	<u>B'burg</u>	<u>Warsaw</u>	<u>7-location</u>		<u>7-location</u>		<u>7-location</u>	
<u>Entry</u>	<u>Designation</u>	<u>Traits</u>	<u>MD</u>	<u>NC</u>	<u>NC</u>	<u>SC</u>	<u>SC</u>	<u>VA</u>	<u>VA</u>	<u>mean</u>	<u>rank</u>	<u>hulled mean</u>	<u>rank</u>	<u>hulless mean</u>	<u>rank</u>
1	Wysor		13.2	14.0	12.9	15.3	16.0	13.7	14.2	14.2	20	14.2	12		
2	Perkins		15.0	14.2	13.1	18.3	16.6	15.4	15.1	15.4	3	15.4	3		
3	Price		13.9	14.6	13.6	17.8	15.2	14.2	15.5	15.0	7	15.0	5		
4	Cargill 26		12.0	12.4	11.4	16.6	14.7	13.0	12.7	13.3	21	13.3	13		
5	Cargill 27	2-row	13.2	13.9	12.8	18.2	16.1	15.6	15.3	15.0	6	15.0	4		
6	MD931043-25		14.2	14.9	12.8	17.5	16.3	14.0	15.0	15.0	9	15.0	6		
7	MD931046-38		12.7	14.0	13.0	17.4	15.6	14.3	14.8	14.5	14	14.5	8		
8	MD931046-93		13.0	14.0	13.3	17.6	15.4	14.4	15.1	14.7	12	14.7	7		
9	NE98919		13.4	12.9	13.6	15.6	16.9	13.6	13.9	14.3	17	14.3	10		
10	NB018199		12.1	13.7	11.9	18.0	17.0	14.7	13.3	14.4	16	14.4	9		
11	NC99-1253		14.8	15.4	14.9	18.6	18.3	15.5	17.3	16.4	1	16.4	1		
12	NC00-592		15.4	16.2	15.0	18.0	16.7	15.7	16.0	16.1	2	16.1	2		
13	VA04B-180		13.1	13.7	13.0	16.7	15.0	14.0	14.3	14.3	19	14.3	11		
14	Doyce	hulless	13.4	14.7	12.8	17.5	14.4	13.6	14.4	14.4	15			14.4	7
15	TX00D639	hulless	14.5	14.3	12.9	16.9	16.7	14.5	14.8	14.9	10			14.9	4
16	TX00D664	hulless	13.9	15.4	13.3	17.2	16.8	15.3	15.7	15.4	4			15.4	1
17	VA01H-1	hulless	13.5	14.6	13.1	16.4	15.8	14.6	14.6	14.7	13			14.7	6
18	VA01H-68	hulless	13.7	15.8	13.2	16.4	16.3	14.8	14.6	15.0	8			15.0	3
19	VA00H-125	hulless	15.3	14.9	12.7	17.0	16.2	14.5	14.7	15.0	5			15.0	2
20	VA03H-61	hulless	13.6	15.0	13.1	17.1	16.7	14.2	14.1	14.8	11			14.8	5
21	VA04H-53	hulless	13.1	14.0	11.8	16.3	16.4	13.8	14.5	14.3	18			14.3	8
	Mean		13.7	14.4	13.1	17.2	16.1	14.4	14.8	14.8		14.8		14.8	
	CV (%)			4.1						4.1		4.2		3.4	
	LSD (0.05)			1.2						0.6		0.7		0.5	

* Hulled entries were pearled (hulls removed) before milling.

GRAIN β -GLUCAN PERCENT*															
			<u>Q'town</u>	<u>Kinston</u>	<u>L'Springs</u>	<u>Clemson</u>	<u>Florence</u>	<u>B'burg</u>	<u>Warsaw</u>	<u>7-location</u>		<u>7-location</u>		<u>7-location</u>	
<u>Entry</u>	<u>Designation</u>	<u>Traits</u>	<u>MD</u>	<u>NC</u>	<u>NC</u>	<u>SC</u>	<u>SC</u>	<u>VA</u>	<u>VA</u>	<u>mean</u>	<u>rank</u>	<u>hulled mean</u>	<u>rank</u>	<u>hulless mean</u>	<u>rank</u>
1	Wysor		5.85	5.30	6.31	5.17	4.06	6.13	5.67	5.50	8	5.50	7		
2	Perkins		7.07	7.22	7.10	6.90	5.74	4.93	6.18	6.45	1	6.45	1		
3	Price		7.30	6.46	6.84	6.68	5.28	4.99	6.40	6.28	2	6.28	2		
4	Cargill 26		4.55	4.93	5.28	4.78	5.86	3.85	4.89	4.88	20	4.88	12		
5	Cargill 27	2-row	4.64	4.35	4.82	4.40	5.63	4.59	4.47	4.70	21	4.70	13		
6	MD931043-25		5.27	5.72	6.17	3.93	4.14	4.66	5.67	5.08	14	5.08	10		
7	MD931046-38		5.48	4.34	5.59	5.03	5.52	5.89	5.58	5.35	11	5.35	9		
8	MD931046-93		5.07	5.63	6.35	6.31	5.98	6.23	6.49	6.01	5	6.01	5		
9	NE98919		4.92	5.85	5.65	5.11	6.08	4.76	5.66	5.43	9	5.43	8		
10	NB018199		5.70	5.56	6.34	7.29	5.83	5.61	6.02	6.05	3	6.05	3		
11	NC99-1253		5.37	6.58	5.85	6.17	6.36	5.50	6.20	6.00	6	6.00	6		
12	NC00-592		4.58	4.76	4.60	4.67	5.16	4.58	5.80	4.88	19	4.88	11		
13	VA04B-180		6.24	5.85	6.64	5.68	6.25	5.20	6.30	6.02	4	6.02	4		
14	Doyce	hulless	5.37	4.82	5.63	5.03	5.76	4.23	5.06	5.13	13			5.13	4
15	TX00D639	hulless	4.99	4.32	5.08	5.26	5.12	4.58	5.73	5.01	16			5.01	6
16	TX00D664	hulless	4.53	5.61	4.99	4.47	4.99	4.67	5.13	4.91	18			4.91	8
17	VA01H-1	hulless	4.51	5.77	4.94	4.54	5.51	4.77	4.68	4.96	17			4.96	7
18	VA01H-68	hulless	6.51	4.35	4.40	4.70	5.59	4.67	5.00	5.03	15			5.03	5
19	VA00H-125	hulless	5.38	4.58	6.35	5.55	6.33	5.44	5.90	5.65	7			5.65	1
20	VA03H-61	hulless	4.88	4.26	6.47	4.91	6.45	4.76	5.92	5.38	10			5.38	2
21	VA04H-53	hulless	6.35	5.90	4.58	4.96	5.23	4.31	5.93	5.32	12			5.32	3
	Mean		5.45	5.34	5.71	5.31	5.56	4.97	5.65	5.43		5.58		5.17	
	CV (%)									10.89		10.67		11.22	
	LSD (0.05)									0.63		0.64		0.63	

* Hulled entries were pearled (hulls removed) before milling for analysis.

FLOUR AND KERNEL CHARACTERISTICS*																		
			Flour Falling Number (seconds)								Kernel Hardness Score							
			<u>Q'town</u>	<u>Kinston</u>	<u>L'Springs</u>	<u>Clemson</u>	<u>Florence</u>	<u>B'burg</u>	<u>Warsaw</u>	<u>Z-location</u>	<u>Q'town</u>	<u>Kinston</u>	<u>L'Springs</u>	<u>Clemson</u>	<u>Florence</u>	<u>B'burg</u>	<u>Warsaw</u>	<u>Z-location</u>
Entry	Designation	Traits	MD	NC	NC	SC	SC	VA	VA	mean	MD	NC	NC	SC	SC	VA	VA	mean
1	Wysor		643	473	522	502	572	572	518	543	65	78	57	71	79	70	67	70
2	Perkins		598	514	451	591	559	502	498	530	96	83	66	88	84	95	76	84
3	Price		639	479	567	510	472	570	508	535	80	80	62	68	78	78	67	73
4	Cargill 26		448	444	414	452	518	445	442	452	80	79	48	87	86	85	67	76
5	Cargill 27	2-row	362	389	323	514	418	413	366	398	79	65	44	79	69	89	72	71
6	MD931043-25		540	443	543	514	519	468	580	515	71	78	59	78	72	77	63	71
7	MD931046-38		537	507	342	602	551	636	583	537	76	88	65	91	83	82	73	80
8	MD931046-93		640	551	536	574	634	541	680	594	78	88	70	94	82	85	77	82
9	NE98919		537	460	491	508	646	588	392	517	79	79	79	76	83	86	75	80
10	NB018199		535	500	429	595	692	523	464	534	79	84	60	92	89	91	76	82
11	NC99-1253		562	488	477	528	483	573	635	535	76	73	64	73	76	81	69	73
12	NC00-592		652	551	549	524	528	545	583	562	77	78	67	75	81	82	76	77
13	VA04B-180		476	427	472	524	489	631	594	516	68	74	58	74	70	76	59	68
14	Doyce	hulless	507	414	472	492	455	499	440	468	58	66	45	66	60	66	56	60
15	TX00D639	hulless	546	446	396	523	589	599	572	524	76	65	65	70	71	74	72	70
16	TX00D664	hulless	451	463	466	510	462	680	500	505	77	78	63	69	69	89	69	73
17	VA01H-1	hulless	433	444	444	487	400	524	527	466	75	76	66	73	72	81	69	73
18	VA01H-68	hulless	489	400	486	477	472	646	194	452	58	63	57	59	64	60	54	59
19	VA00H-125	hulless	532	481	472	468	421	536	487	485	93	87	58	79	78	90	75	80
20	VA03H-61	hulless	491	483	431	543	559	464	559	504	68	80	64	75	76	80	73	74
21	VA04H-53	hulless	442	420	387	467	518	506	505	464	62	67	57	66	70	68	57	64
	Mean		527	465	460	519	522	546	506	507	75	76	61	76	76	80	69	73
	CV (%)			5						12		4						7
	LSD (0.05)			46						64		6						6
* Hulled entries were pearled (hulls removed) before milling for analysis.																		

KERNEL CHARACTERISTICS*																		
			Kernel Weight (mg)								Kernel Diameter (mm)							
			<u>Q'town</u>	<u>Kinston</u>	<u>L'Springs</u>	<u>Clemson</u>	<u>Florence</u>	<u>B'burg</u>	<u>Warsaw</u>	<u>Z-location</u>	<u>Q'town</u>	<u>Kinston</u>	<u>L'Springs</u>	<u>Clemson</u>	<u>Florence</u>	<u>B'burg</u>	<u>Warsaw</u>	<u>Z-location</u>
Entry	Designation	Traits	MD	NC	NC	SC	SC	VA	VA	mean	MD	NC	NC	SC	SC	VA	VA	mean
1	Wysor		32.89	28.30	31.36	27.63	30.87	30.07	30.05	30.17	2.15	1.98	2.14	1.83	2.03	2.00	2.10	2.03
2	Perkins		25.73	25.89	27.87	26.59	29.31	25.03	29.78	27.17	1.83	2.05	2.12	1.97	2.11	1.79	2.19	2.01
3	Price		28.02	27.13	28.89	27.66	28.00	28.05	31.23	28.43	2.14	2.15	2.11	2.06	2.11	2.06	2.35	2.14
4	Cargill 26		32.54	28.38	32.01	25.86	28.74	32.27	33.71	30.50	2.11	2.07	2.25	1.81	2.01	2.14	2.33	2.10
5	Cargill 27	2-row	37.35	43.13	45.66	34.54	45.20	36.61	41.10	40.51	2.31	2.73	2.59	2.16	2.60	2.26	2.58	2.46
6	MD931043-25		27.81	28.49	30.43	23.69	28.80	27.40	30.33	28.14	2.05	2.17	2.26	1.83	2.09	2.04	2.33	2.11
7	MD931046-38		30.03	27.15	30.03	23.78	28.64	27.50	30.37	28.21	2.14	2.07	2.19	1.73	2.07	1.95	2.22	2.05
8	MD931046-93		29.61	25.59	27.01	23.12	29.36	27.65	28.40	27.25	2.14	1.97	2.05	1.72	2.10	2.00	2.09	2.01
9	NE98919		28.53	26.71	27.65	30.11	30.05	27.49	31.03	28.80	2.07	1.93	2.00	1.98	2.03	1.86	2.16	2.00
10	NB018199		29.43	27.58	30.57	27.30	30.29	24.73	30.69	28.66	2.04	2.03	2.19	1.99	2.08	1.75	2.18	2.04
11	NC99-1253		27.56	27.22	27.36	24.59	29.18	27.08	30.11	27.59	2.16	2.32	2.17	1.99	2.22	2.09	2.33	2.18
12	NC00-592		32.49	29.04	30.58	27.73	29.74	29.61	30.83	30.00	2.24	2.21	2.28	1.97	2.10	2.11	2.26	2.17
13	VA04B-180		31.74	27.85	30.76	26.00	30.00	30.56	34.38	30.18	2.23	2.11	2.20	1.94	2.16	2.12	2.42	2.17
14	Doyce	hulless	31.56	28.50	33.74	25.99	28.10	26.05	31.66	29.37	2.06	1.99	2.19	1.79	1.87	1.76	2.15	1.97
15	TX00D639	hulless	27.13	28.45	27.10	25.78	27.46	26.16	28.02	27.16	1.81	1.87	1.92	1.77	1.81	1.75	1.91	1.83
16	TX00D664	hulless	27.31	25.32	29.56	23.96	29.32	25.01	31.56	27.43	1.93	1.88	2.05	1.70	1.95	1.75	2.16	1.92
17	VA01H-1	hulless	28.77	31.09	30.27	26.28	30.68	27.44	32.24	29.54	1.95	2.14	2.06	1.80	1.96	1.88	2.19	2.00
18	VA01H-68	hulless	35.80	32.15	35.87	30.08	33.11	34.76	36.61	34.05	2.41	2.18	2.37	1.95	2.16	2.25	2.36	2.24
19	VA00H-125	hulless	25.29	26.41	35.69	23.41	26.92	24.40	28.90	27.29	1.91	2.01	2.38	1.71	1.87	1.80	2.08	1.97
20	VA03H-61	hulless	30.88	30.95	31.17	27.18	30.43	27.89	33.73	30.32	2.11	2.18	2.18	1.87	2.04	1.96	2.27	2.09
21	VA04H-53	hulless	31.59	31.10	32.01	27.41	31.85	27.29	36.43	31.10	2.02	1.98	2.06	1.78	1.90	1.82	2.19	1.96
	Mean		30.10	28.88	31.22	26.61	30.29	28.24	31.96	29.60	2.09	2.09	2.18	1.87	2.06	1.96	2.23	2.07
	CV (%)			3.95						5.87		2.98						4.24
	LSD (0.05)			2.38						1.84		0.13						0.09
* Hulled entries were pearled (hulls removed) before milling for analysis.																		