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UNIFORM BREAD WHEAT TRIAL

Final Report

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The purpose of the Uniform Bread Wheat Trial (UBWT) is to evaluate hard endosperm, bread quality, winter habit cultivars and advanced lines for adaptation to the high rainfall, humid environments of the eastern United States. The entries in this 1st UBWT were selected from public and private breeding programs in the southern and central Great Plains. A total of 41 entries (33 hard red, 4 hard white, and 4 soft red) were included in the trial. There were nine testing locations for the 2002-03 UBWT, with one in Georgia, three in North Carolina, three in Virginia, one in Kentucky, and one in Pennsylvania (Fig. 1). One location in Maryland (Wye Mills) was planted but subsequently lost to flooding.

Over all locations, the four soft wheats ranked higher than all the hard wheats for grain yield, however, the hard wheat line TX99D4478 yielded statistically the same (P=0.05) as the lowest yielding soft wheat 'Roane'. There was a 9.7 bu/acre yield difference between the highest yielding soft wheat, 'Tribute' and the highest yielding hard wheat, TX99D4478. The highest yielding hard wheats were all experimental lines (TX99D4478, TX99D4441, TX98D1170, and TX96D1073). The top five released, hard wheat cultivars for grain yield over all locations were 'Ike', 'Custer', 'TAM 302', 'Coronado', and 'Lakin'. At six individual locations (Plains, GA, Salisbury, NC, Painter, VA, Warsaw, VA, Lexington, KY, and State College, PA), there were hard wheats that had grain yields equal to, or higher than, the soft wheats. Test weights were relatively low at all locations except Salisbury, NC. Several hard wheats had test weights comparable to or higher than the soft wheats.

Heading date, height, and lodging scores varied widely among all entries. There was also wide variation for resistance to powdery mildew, glume blotch, scab, leaf rust, and soilborne mosaic. The kernel hardness scores were consistent and true-to-type across all locations tested with the exception of the HRWs TX98D2334 at Kinston, NC and 'Thunderbolt' at Warsaw, VA (both scored 'mixed'); and the SRWs 'Roane' at Plymouth, NC and Painter, VA, and 'Tribute' at Plains, GA, and Plymouth, NC (both scored 'mixed'). Complete milling and baking data will be distributed when available.

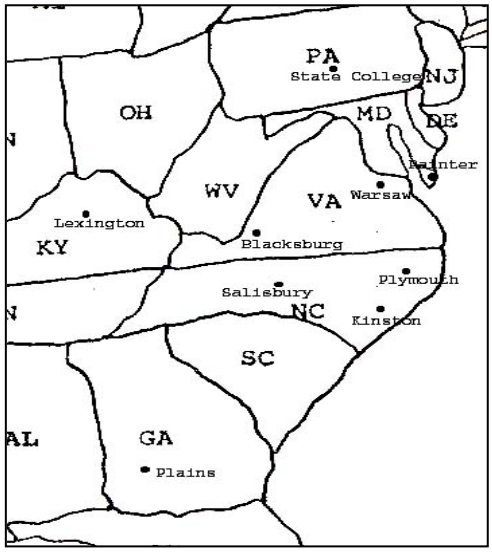

Figure 1. Nine locations of the 2002-03 Uniform Bread Wheat Trial.

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USDA/ARS Uniform Bread Wheat Trial 2002-03
Entries

Entry	*Designation*	*Pedigree*	*Class*	*Source*
1	Cutter	Jagger/WI89-189-14 (=PI631389; W97-234)	HRW	AgriPro
2	Hondo	W84-179/W81-171/3/Sturdy/Hawk//Vona/W76-1141 (=PI603958; W95-210)	HRW	AgriPro
3	Jagalene	Jagger/Abilene (=PI631376; W98-362)	HRW	AgriPro
4	Ogallala	TX81V6187/Abilene (=PI573037; WI89-055)	HRW	AgriPro
5	2137	W2440/W9488A//2163 (=PI592444; HBF0263-137; KS92P0263-137)	HRW	KSU
6	2145	HBA142A/HBZ621A//Abilene (=PI631087; KS97PO630-4-5)	HRW	KSU
7	Ike	Dular/Eagle//2*Cheney/Larned/3/Colt (=PI574488; KS889H48)	HRW	KSU
8	Jagger	KS82W418/Stephens (=PI593688; KS84063-9-39-3)	HRW	KSU
9	Lakin	KS89H130/Arlin (=PI617032; KS96HW115)	HWW	KSU
10	Stanton	PI220350/KS87H57//TAM200/KS87H66/3/KS87H325 (=PI617033; KS95H167-3)	HRW	KSU
11	Trego	KS87H325/Rio Blanco (=PI612576; KS95HW62-6)	HWW	KSU
12	Arapahoe	Brule/3/Parker*4/Agent//Beloterkovskaia 198/Lancer (=PI518591; NE82656)	HRW	UNE
13	Millennium	Arapahoe/Abilene/4/Colt/3/Warrior*5/Agent//Kavkaz (=PI613099; NE94479)	HRW	UNE
14	NuPlains	Abilene/KS831872 (=PI605741; N94L205)	HWW	UNE
15	Vista	NE68513/NE68457//Centurk (=PI562653; NE87615)	HRW	UNE
16	Windstar	TX79A2729//Caldwell/Brule seln#6/3/Siouxland (=PI597379; NE90625)	HRW	UNE
17	2174	IL71-5662/PL145//2165 (=PI602595; HBZ374C)	HRW	OSU
18	Custer	F29-76/TAM 105//Chisholm (=OK88767-11)	HRW	OSU
19	Intrada	Rio Blanco/TAM200 (=PI631402; OK95G701)	HWW	OSU
20	OK 101	OK87W663/Mesa//2180 (=PI631493; OK95571)	HRW	OSU
21	Sturdy 2K	Sinvalocho/Wichita//CI11969/Wichita/3/Seu Seun 1 (=TX391-56-D1-23)	HRW	TAM
22	TAM 110	TAM 105*4/Amigo*4//Largo (=PI595757; TXGH12588-105)	HRW	TAM
23	TAM 111	TAM 107//TX78V3630/Centurk 78/3/TX87V1233 (=PI631352; TX95A3091)	HRW	TAM
24	TAM 202	Siouxland outcross (=PI561933; TX86V1405)	HRW	TAM
25	TAM 301	Mit/Kavkaz (=PI596544; TX89D9627)	HRW	TAM
26	TAM 302	Probrand 812/Caldwell//TX86D1310 (=PI605910; TX91D6913)	HRW	TAM
27	TX96D1073	TX86D1310/Kavkaz//TX86D1308 (=WX87D144-10-99-12-18)	HRW	TAM
28	TX98D1170	TX89D1253*2/TTCC404 (=WX93D208-9-1-2)	HRW	TAM
29	TX98D2334	WX93D208/WX93D246 (=WX94D018-5-1)	HRW	TAM
30	TX98D2423	2163*W3453/W2441 (=TX92D4351-2-11-13-1) (=HBG0056 sel)	HRW	TAM
31	TX99D4151	AFS93175 (=TX94D175-1-33)	HRW	TAM
32	TX99D4441	TX87V1209//Coker 762/TX86V1405 (=TX91-98-1-D13)	HRW	TAM
33	TX99D4478	TX92D8040*3/TTCC259 (=WX93D230-1)	HRW	TAM
34	TX99D4596	RL6078/G8184 (=WX89D119-416-BVL)	HRW	TAM
35	AGS 2000	Pioneer 2555/PF84301//Florida 302 (=PI612956; GA89482E7)	SRW	UGA
36	NC98-26143	Saluda/GA801468//Coker 9904	SRW	NCSU
37	Roane	VA71-54-147/Coker 68-15//IN65309C1-18-2-3-2 (=PI612958; VA93-54-429)	SRW	VPI
38	Tribute	VA92-51-39/AL870365 (=VA98W-593)	SRW	VPI
39	Thunderbolt	Abilene/KS90WGRC10 (=PI608000; W95-188)	HRW	AgriPro
40	Coronado	W85-084/W85-225 (=PI591625; W91-287)	HRW	AgriPro
41	Dumas	WI90-425/WI89-483 (=PI619199; W95-385)	HRW	AgriPro

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GRAIN YIELD

Entry	Designation	Plains bu/ac	GA rank	Kinston bu/ac	NC rank	Salisbury bu/ac	NC rank	Plymouth bu/ac	NC rank	Blacksburg bu/ac	VA rank
1	Cutter	45.3	26	20.5	29	32.9	32	36.6	18	27.6	30
2	Hondo	29	38	20.0	31	47.5	9	15.0	40	37.2	10
3	Jagalene	45.5	25	20.9	27	35.5	28	35.4	23	24.1	32
4	Ogallala	31.4	35	18.6	34	23.0	37	20.6	38	22.8	35
5	2137	60.3	8	24.7	23	49.1	7	35.5	22	32.6	20
6	2145	52.6	19	27.5	17	33.4	30	39.5	13	30.6	24
7	Ike	50.2	21	20.6	28	47.3	10	36.8	17	31.5	21
8	Jagger	55.1	16	29.0	15	30.6	33	46.2	6	34.1	17
9	Lakin	54.6	17	30.5	12	41.1	20	36.4	19	36.1	13
10	Stanton	29.1	37	19.8	32	22.5	40	23.6	34	17.8	40
11	Trego	36.3	32	15.8	36	25.6	35	28.4	28	22	37
12	Arapahoe	37.8	30	18.9	33	35.1	29	26.6	30	30.9	23
13	Millennium	28.2	39	12.8	39	39.2	21	25.9	31	29.6	26
14	NuPlains	37.5	31	14.4	37	37.2	26	28.5	27	23.9	33
15	Vista	16.2	41	12.0	40	22.7	39	16.6	39	22.8	36
16	Windstar	30.8	36	14.0	38	37.4	24	21.8	37	34.8	14
17	2174	57.9	12	25.4	21	42.5	16	32.6	24	27.9	29
18	Custer	57.8	13	38.4	6	46.3	14	35.6	21	36.7	12
19	Intrada	34.7	34	9.5	41	21.3	41	14.4	41	8.6	41
20	OK 101	45.5	24	22.5	26	24.6	36	30.3	26	21.9	38
21	Sturdy 2K	60.2	9	24.8	22	38.8	22	40.3	11	27.3	31
22	TAM 110	44	27	25.5	20	46.7	13	22.3	36	37.4	9
23	TAM 111	41.5	28	22.7	25	37.3	25	35.9	20	23.3	34
24	TAM 202	26.3	40	29.7	14	37.5	23	25.3	33	28.8	27
25	TAM 301	48.3	22	25.6	19	41.3	19	36.9	16	31.1	22
26	TAM 302	52.8	18	20.2	30	47.0	11	25.8	32	32.7	19
27	TX96D1073	70.1	2	33.2	10	41.4	18	39.4	14	37.6	8
28	TX98D1170	59.3	10	34.3	8	48.7	8	39.9	12	37.2	11
29	TX98D2334	46.4	23	26.3	18	42.2	17	42.4	10	34.3	16
30	TX98D2423	56.9	14	28.9	16	46.7	12	49.5	5	34.7	15
31	TX99D4151	64.7	5	30.2	13	26.2	34	31.8	25	39.6	7
32	TX99D4441	50.3	20	33.5	9	49.1	6	45.9	7	45.9	6
33	TX99D4478	56.7	15	41.3	5	51.6	4	44.1	9	48.9	5
34	TX99D4596	36	33	23.4	24	22.7	38	23.1	35	28.7	28
35	AGS 2000	66.2	4	49.6	3	61.3	2	62.2	1	61.3	2
36	NC98-26143	69.1	3	50.2	2	52.6	3	53.2	3	57.8	3
37	Roane	73.5	1	44.2	4	51.1	5	52.8	4	57.1	4
38	Tribute	61.9	6	54.6	1	61.6	1	57.6	2	62	1
39	Thunderbolt	39.5	29	16.4	35	33.3	31	28.1	29	20.2	39
40	Coronado	60.6	7	30.9	11	43.3	15	45.4	8	32.8	18
41	Dumas	58.2	11	36.8	7	37.1	27	37.4	15	30.4	25
	Mean	48.3		26.8		39.3		34.9		33.2	
	LSD (5%)	9.9		5.6		5.5		8.1		12.83	
	CV (%)	9.8		13.6		12.4		11.5		5.77	

GRAIN YIELD

Entry	Designation	Painter bu/ac	VA rank	Warsaw bu/ac	VA rank	Lexington bu/ac	KY rank	StCollege bu/ac	PA rank	9 location bu/ac	mean rank
1	Cutter	70.8	22	24.4	37	49.9	23	21.3	35	36.6	32
2	Hondo	61.5	37	48.5	8	59.5	9	44.1	6	40.4	22
3	Jagalene	88.0	1	36.7	25	45.0	34	21.1	36	39.1	27
4	Ogallala	75.6	13	14.1	40	46.5	32	22.0	32	30.5	39
5	2137	74.7	15	39.1	21	48.1	28	22.6	31	43.0	17
6	2145	51.3	41	27.6	36	47.6	29	20.8	37	36.7	31
7	Ike	80.5	6	47.0	10	57.3	11	47.4	2	46.5	10
8	Jagger	70.5	23	39.0	22	46.5	33	27.8	26	42.1	20
9	Lakin	70.0	26	40.4	17	55.7	15	34.4	16	44.4	15
10	Stanton	81.4	4	31.0	33	44.2	35	15.9	40	31.7	37
11	Trego	62.2	36	29.5	35	36.7	40	21.7	34	30.9	38
12	Arapahoe	79.7	7	40.9	15	48.2	26	38.4	12	39.7	26
13	Millennium	66.2	30	39.9	19	55.2	16	41.5	8	37.6	30
14	NuPlains	74.9	14	38.2	23	52.6	19	36.3	13	38.2	29
15	Vista	68.9	27	34.8	28	35.4	41	28.9	25	28.7	40
16	Windstar	79.2	9	36.8	24	50.5	22	44.6	4	38.9	28
17	2174	68.6	28	34.2	29	50.7	21	32.0	19	41.3	21
18	Custer	72.1	18	40.7	16	57.0	13	29.5	23	46.0	11
19	Intrada	81.3	5	9.0	41	38.0	39	11.6	41	25.4	41
20	OK 101	60.9	38	24.2	38	48.2	27	21.8	33	33.3	35
21	Sturdy 2K	74.7	16	39.6	20	49.8	24	29.5	24	42.8	18
22	TAM 110	60.6	39	42.6	12	39.9	38	39.0	11	39.8	25
23	TAM 111	82.1	3	35.2	27	56.9	14	27.3	28	40.2	23
24	TAM 202	65.9	32	30.6	34	47.3	30	24.3	29	35.1	33
25	TAM 301	58.0	40	35.9	26	53.6	17	30.8	21	40.2	24
26	TAM 302	70.1	25	48.5	9	70.5	1	35.7	14	44.8	12
27	TX96D1073	82.3	2	33.6	30	48.5	25	34.7	15	46.8	9
28	TX98D1170	64.7	33	41.2	14	65.1	5	44.4	5	48.2	8
29	TX98D2334	77.5	10	40.0	18	57.1	12	34.2	17	44.5	13
30	TX98D2423	76.9	11	54.0	5	61.7	7	32.3	18	49.1	6
31	TX99D4151	71.9	20	41.6	13	44.0	36	31.8	20	42.4	19
32	TX99D4441	66.9	29	56.0	4	64.7	6	27.8	27	48.9	7
33	TX99D4478	64.0	34	53.8	6	61.5	8	46.8	3	52.1	5
34	TX99D4596	76.7	12	33.0	31	43.8	37	20.3	38	34.2	34
35	AGS 2000	70.2	24	65.4	3	68.9	3	40.9	9	60.6	2
36	NC98-26143	79.7	8	68.0	2	65.2	4	40.0	10	59.5	3
37	Roane	63.8	35	52.4	7	69.2	2	43.8	7	56.4	4
38	Tribute	71.5	21	77.4	1	59.1	10	50.5	1	61.8	1
39	Thunderbolt	66.0	31	20.4	39	46.8	31	23.4	30	32.7	36
40	Coronado	72.1	19	44.5	11	52.3	20	18.4	39	44.5	14
41	Dumas	73.7	17	32.4	32	53.1	18	29.6	22	43.1	16
	Mean	71.4		39.6		52.5		31.4		41.9	
	LSD (5%)	20.7		17.2		8.9		13.9		7.0	
	CV (%)	17.2		20.7		12.5		6.1		13.4	

TEST WEIGHT

Entry	Designation	Plains GA lb/bu	Kinston NC lb/bu	Salisbury NC lb/bu	Plymouth NC lb/bu	Blacksburg VA lb/bu	Painter VA lb/bu	Warsaw VA lb/bu	Lexington KY lb/bu	StCollege PA lb/bu	9 loc. mean lb/bu	rank
1	Cutter	53	51.9	59.9	48.2	44.8	57.9	53.2	58.7	46.0	52.6	29
2	Hondo	50	51.6	62.1	44.1	51.8	57.3	58.9	60.5	57.0	54.8	15
3	Jagalene	54	55.1	62.7	53.0	48.2	58.5	57.5	58.1	46.0	54.8	16
4	Ogallala	54	52.3	61.3	48.8	47.1	58.9	49.9	60.0	50.2	53.6	21
5	2137	57	53.3	61.6	53.0	49.1	59.8	55.8	59.0	46.8	55.0	11
6	2145	51	52.1	59.2	50.1	44.6	58.0	50.1	57.5	47.3	52.2	35
7	Ike	54	55.8	61.6	52.9	51.6	59.7	57.3	60.2	54.5	56.4	6
8	Jagger	52	55.5	55.8	53.1	46.8	58.0	55.9	54.8	50.1	53.6	23
9	Lakin	55	56.7	60.0	53.1	51.1	60.0	55.7	59.4	51.7	55.9	7
10	Stanton	51	52.5	59.0	48.9	45.3	58.7	53.0	53.1	45.6	51.8	37
11	Trego	54	54.3	62.0	52.7	48.0	59.9	55.6	58.3	47.8	54.7	17
12	Arapahoe	51	53.3	60.7	48.7	47.7	58.1	56.1	52.6	51.6	53.3	25
13	Millennium	47	51.9	56.8	48.7	46.4	57.6	55.9	55.2	53.0	52.5	31
14	NuPlains	50	51.9	61.2	52.1	44.5	57.0	53.6	53.7	49.6	52.6	28
15	Vista	44	49.9	59.2	49.7	47.3	55.9	52.9	50.6	47.8	50.8	39
16	Windstar	49	49.8	58.8	46.7	47.8	55.4	54.4	55.5	51.6	52.1	36
17	2174	55	53.2	64.4	51.5	46.8	57.1	53.8	57.0	50.7	54.4	19
18	Custer	56	55.9	60.9	51.9	48.9	59.8	55.3	57.1	49.3	55.0	12
19	Intrada	51	50.3	60.3	48.7	43.7	56.8	48.9	56.6	44.4	51.2	38
20	OK 101	54	52.3	59.1	51.0	43.4	58.5	51.4	55.1	48.3	52.6	30
21	Sturdy 2K	54	52.3	60.6	52.0	45.8	59.0	53.7	55.5	48.6	53.5	24
22	TAM 110	51	51.7	61.9	50.9	48.3	57.7	55.2	55.3	50.3	53.6	22
23	TAM 111	52	52.4	61.3	51.7	44.4	57.1	53.2	52.5	47.6	52.5	33
24	TAM 202	48	51.5	60.8	49.7	45.8	58.1	52.6	57.0	48.7	52.5	32
25	TAM 301	54	54.1	64.1	54.6	47.6	59.4	54.2	58.5	49.7	55.1	10
26	TAM 302	52	50.7	60.3	47.5	45.8	56.8	53.9	56.0	47.2	52.2	34
27	TX96D1073	57	57.3	64.8	57.4	51.0	60.2	58.9	58.0	52.1	57.4	3
28	TX98D1170	54	52.8	62.4	53.4	47.0	56.4	53.7	55.6	50.9	54.0	20
29	TX98D2334	54	54.2	63.1	56.6	51.4	60.8	58.4	58.8	52.3	56.6	4
30	TX98D2423	55	54.9	61.2	55.5	49.0	59.0	57.8	56.9	48.2	55.3	8
31	TX99D4151	54	52.3	59.7	50.5	47.2	57.6	53.1	54.5	50.5	53.3	26
32	TX99D4441	47	49.4	60.7	49.8	45.0	54.2	52.5	54.8	41.6	50.7	40
33	TX99D4478	55	55.0	62.5	55.7	47.9	53.2	57.3	58.6	52.0	55.2	9
34	TX99D4596	50	50.5	55.2	46.7	44.7	56.2	52.7	50.1	44.2	50.0	41
35	AGS 2000	55	57.3	61.4	55.3	53.9	58.7	58.8	58.5	49.2	56.5	5
36	NC98-26143	51	54.4	60.4	54.7	46.4	51.4	55.5	55.4	46.3	52.8	27
37	Roane	58	57.8	62.4	55.8	53.1	60.2	58.1	60.5	55.3	57.9	2
38	Tribute	56	59.6	62.8	55.1	54.5	60.6	61.1	60.8	56.1	58.5	1
39	Thunderbolt	55	51.7	64.3	53.2	46.9	59.7	53.8	59.7	48.3	54.7	18
40	Coronado	56	56.1	62.7	55.0	47.2	59.4	56.8	55.7	45.1	54.9	14
41	Dumas	55	55.2	61.9	54.3	48.3	59.4	54.0	55.6	51.1	55.0	13
	Mean	52.7	53.4	61.5	51.8	47.7	58.0	58.0	56.6	49.4	54.0	
	LSD (5%)		1.7	2.4	2.4	2.6	3.0	0.9	8.9	2.5	1.8	
	CV (%)		1.6	1.8	2.1	4.1	3.1	1.3	12.5	1.7	2.9	

HEADING DATE (JULIAN)

Entry	Designation	Plains GA	Kinston NC	Salisbury NC	Blacksburg VA	Warsaw VA	Lexington KY	StCollege PA	6 loc. mean*	rank
1	Cutter	105	118.0	125.0	129	127	130	154.5	130.6	23
2	Hondo	109	126.0	131.0	134	132	135	160.3	136.4	38
3	Jagalene	105	117.7	126.5	129	128	130	154.8	131.0	26
4	Ogallala	109	120.3	124.5	129	130	130	154.8	131.4	30
5	2137	107	119.7	124.0	129	127	129	153.8	130.4	22
6	2145	101	113.7	122.5	129	128	130	155.0	129.7	17
7	Ike	late	126.3	130.5	131	131	131	153.5	133.9	35
8	Jagger	100	112.3	120.5	126	124	124	149.8	126.1	1
9	Lakin	102	112.3	121.0	128	127	128	150.8	127.9	6
10	Stanton	110	118.0	127.0	130	127	130	152.8	130.8	25
11	Trego	102	119.0	125.5	130	128	130	155.0	131.3	27
12	Arapahoe	late	126.7	132.0	133	132	135	158.8	136.3	37
13	Millennium	late	127.7	133.0	134	132	135	159.8	136.9	39
14	NuPlains	late	126.3	131.0	133	131	133	158.0	135.4	36
15	Vista	late	128.0	135.5	135	131	136	160.3	137.6	41
16	Windstar	late	127.3	133.0	134	133	136	160.5	137.3	40
17	2174	105	117.0	121.0	129	127	129	152.0	129.2	12
18	Custer	102	110.7	119.0	128	126	128	152.0	127.3	4
19	Intrada	102	116.0	123.5	129	128	130	157.5	130.7	25
20	OK 101	102	111.0	118.0	128	126	126	149.5	126.4	2
21	Sturdy 2K	102	115.0	122.0	129	128	129	156.5	129.9	20
22	TAM 110	105	110.3	121.5	127	126	127	152.3	127.4	5
23	TAM 111	107	115.7	122.0	129	127	130	154.3	129.7	16
24	TAM 202	110	113.3	120.0	127	127	129	156.5	128.8	11
25	TAM 301	110	115.7	122.0	129	128	130	154.0	129.8	18
26	TAM 302	105	119.7	129.0	131	129	131	159.8	133.3	34
27	TX96D1073	101	113.0	119.5	128	126	129	152.5	128.0	7
28	TX98D1170	101	112.0	121.0	128	126	128	153.5	128.1	9
29	TX98D2334	105	118.0	122.5	128	127	129	153.0	129.6	15
30	TX98D2423	106	119.0	125.0	131	128	130	157.0	131.7	31
31	TX99D4151	104	114.3	122.0	129	128	130	155.8	129.9	19
32	TX99D4441	107	117.0	124.0	130	127	131	159.5	131.4	29
33	TX99D4478	105	112.0	121.0	128	127	128	152.3	128.1	8
34	TX99D4596	108	118.3	125.0	130	128	130	160.5	132.0	32
35	AGS 2000	103	112.3	121.5	129	128	129	157.5	129.6	14
36	NC98-26143	100	115.7	124.0	131	128	130	159.3	131.3	28
37	Roane	105	115.0	124.0	131	127	130	155.5	130.4	21
38	Tribute	106	114.7	123.0	128	125	130	154.5	129.2	13
39	Thunderbolt	late	121.7	130.5	130	129	131	156.3	133.1	33
40	Coronado	99	111.7	119.5	128	125	128	150.3	127.1	3
41	Dumas	100	112.0	121.5	129	128	129	152.3	128.6	10
	Mean		117.3	124.5	130	128	130.1	155.3	130.8	
	LSD (5%)		2.2	1.9	0.7	0.83		0.6	2.1	
	CV (%)		1.5	1.8	0.4	0.43		1.5	3.1	

*** Plains, GA heading dates not included in mean.**

HEIGHT

Entry	Designation	Plains GA in.	Blacksburg VA in.	Lexington KY in.	StCollege PA in.	4 location mean in.	rank
1	Cutter	36	34	31	37.3	34.6	26
2	Hondo	38	36	35	37.0	36.5	35
3	Jagalene	31	31	21	36.5	29.9	1
4	Ogallala	31	32	30	34.0	31.8	8
5	2137	37	32	29	37.3	33.8	23
6	2145	33	32	29	35.5	32.4	12
7	Ike	40	37	36	40.8	38.5	39
8	Jagger	37	32	29	35.5	33.4	18
9	Lakin	37	33	31	38.3	34.8	29
10	Stanton	33	36	34	41.8	36.2	32
11	Trego	34	31	30	36.8	33.0	15
12	Arapahoe	41	37	39	42.8	40.0	41
13	Millennium	38	37	35	42.0	38.0	38
14	NuPlains	40	35	37	39.8	38.0	37
15	Vista	32	31	32	34.5	32.4	10
16	Windstar	38	38	38	40.0	38.5	40
17	2174	38	34	31	38.8	35.5	31
18	Custer	33	30	31	35.8	32.5	14
19	Intrada	33	31	28	33.8	31.5	7
20	OK 101	35	33	31	39.5	34.6	28
21	Sturdy 2K	35	37	32	41.3	36.3	33
22	TAM 110	32	32	29	34.8	32.0	9
23	TAM 111	35	34	32	37.5	34.6	27
24	TAM 202	30	32	28	32.0	30.5	3
25	TAM 301	29	31	31	33.8	31.2	5
26	TAM 302	36	32	33	33.8	33.7	22
27	TX96D1073	36	33	29	36.0	33.5	20
28	TX98D1170	34	34	31	34.5	33.4	19
29	TX98D2334	41	35	34	36.0	36.5	34
30	TX98D2423	38	35	32	34.8	35.0	30
31	TX99D4151	32	29	27	31.8	30.0	2
32	TX99D4441	33	35	32	37.0	34.3	25
33	TX99D4478	33	32	32	36.3	33.3	17
34	TX99D4596	31	34	31	33.5	32.4	13
35	AGS 2000	32	34	32	36.3	33.6	21
36	NC98-26143	39	36	34	37.8	36.7	36
37	Roane	35	31	29	34.5	32.4	11
38	Tribute	32	31	29	33.5	31.4	6
39	Thunderbolt	35	32	33	35.8	34.0	24
40	Coronado	32	30	28	34.0	31.0	4
41	Dumas	33	32	32	35.8	33.2	16
	Mean	34.8	33	31.4	36.5	34.0	
	LSD (5%)		1.8		5.5	2.4	
	CV (%)		3.9		2.7	3.4	

LODGING

Entry	Designation	Plains GA 0-9	Blacksburg VA 0.2-10.0	Warsaw VA 0.2-10.0	StCollege PA 0-9
1	Cutter	4	3.0	2.0	3.3
2	Hondo	7	2.3	0.2	3.4
3	Jagalene	0	1.0	0.2	3.3
4	Ogallala	0	0.9	0.4	3.8
5	2137	0	0.2	0.2	2.0
6	2145	0	0.7	0.2	2.5
7	Ike	0	1.9	0.2	1.5
8	Jagger	0	1.3	0.2	1.1
9	Lakin	2	1.1	0.2	1.8
10	Stanton	0	0.7	0.2	1.9
11	Trego	3	0.9	0.2	5.4
12	Arapahoe	0	0.7	0.2	4.5
13	Millennium	0	0.4	0.2	3.8
14	NuPlains	0	0.6	0.2	6.5
15	Vista	0	0.2	0.2	3.6
16	Windstar	0	0.9	0.2	4.1
17	2174	0	0.3	0.2	1.8
18	Custer	1	1.1	0.2	2.0
19	Intrada	4	3.4	5.2	7.7
20	OK 101	3	0.9	0.4	3.4
21	Sturdy 2K	6	2.2	0.2	4.5
22	TAM 110	0	1.9	0.2	2.9
23	TAM 111	0	0.6	0.2	3.2
24	TAM 202	0	3.0	0.2	3.8
25	TAM 301	0	1.1	1.0	3.6
26	TAM 302	5	0.7	0.2	6.1
27	TX96D1073	0	0.5	0.5	1.4
28	TX98D1170	8	2.6	0.2	4.8
29	TX98D2334	2	2.0	0.2	2.1
30	TX98D2423	0	0.7	0.2	4.3
31	TX99D4151	3	1.1	0.2	3.6
32	TX99D4441	0	0.9	0.2	0.6
33	TX99D4478	0	0.5	0.2	2.0
34	TX99D4596	0	1.6	0.2	3.6
35	AGS 2000	0	1.2	0.2	0.7
36	NC98-26143	2	1.9	0.2	1.5
37	Roane	2	0.3	0.2	1.9
38	Tribute	0	0.5	0.2	0.8
39	Thunderbolt	0	0.7	0.2	5.3
40	Coronado	1	1.1	0.2	1.1
41	Dumas	6	2.4	0.2	6.8
	Mean	1.4	1.2	0.4	3.2
	LSD (5%)		0.8	0.4	34.7
	CV (%)		47.2	78.5	1.5

POWDERY MILDEW*

Entry	Designation	Kinston NC 0-9	Salisbury NC 0-9	Plymouth NC 0-9	Blacksburg VA 0-9	Painter VA 0-9	Warsaw VA 0-9	Lexington KY 0-9	StCollege PA 0-9	Severity mean 0-9	Severity rank	Kinston AUC
1	Cutter	8.0	7.3	6.8	5.7	6.5	6.5	6.0	7.0	6.7	33	103.7
2	Hondo	0.0	0.0	0.3	0.3	0.0	0.0	3.7	0.0	0.5	7	5.3
3	Jagalene	7.8	7.3	7.7	6.0	8.5	8.5	8.3	7.5	7.7	40	102.0
4	Ogallala	7.7	6.8	7.3	4.7	7.0	7.0	7.0	7.5	6.9	35	99.3
5	2137	7.0	6.8	6.7	3.0	6.0	6.0	6.0	6.8	6.0	29	83.5
6	2145	7.7	5.8	5.7	2.3	7.0	7.0	6.3	7.0	6.1	30	100.2
7	Ike	7.0	5.0	5.2	1.7	6.0	6.0	5.7	6.8	5.4	26	91.0
8	Jagger	7.5	7.3	7.3	4.7	6.0	6.0	7.3	6.0	6.5	32	97.3
9	Lakin	7.7	6.0	1.7	1.0	5.0	5.0	6.7	5.0	4.8	21	97.7
10	Stanton	8.0	6.8	2.3	7.7	7.0	7.0	8.0	7.3	6.8	34	102.8
11	Trego	7.7	8.3	7.8	6.7	6.5	6.5	8.0	8.0	7.4	38	96.5
12	Arapahoe	5.7	5.8	5.0	2.7	6.0	6.0	6.7	7.0	5.6	27	70.7
13	Millennium	5.5	4.8	4.7	3.3	6.5	6.5	5.7	5.0	5.3	24	74.5
14	NuPlains	5.8	6.0	2.0	3.7	6.0	6.0	5.7	7.3	5.3	25	76.8
15	Vista	4.0	1.0	1.3	2.3	2.0	2.0	4.3	6.5	2.9	12	43.0
16	Windstar	4.7	3.5	3.0	1.3	3.0	3.0	5.3	5.8	3.7	14	58.7
17	2174	6.7	4.5	4.0	2.7	4.0	4.0	4.0	4.3	4.3	16	83.7
18	Custer	6.5	3.8	0.0	0.7	1.5	1.5	5.0	3.8	2.8	11	84.7
19	Intrada	8.7	8.3	8.0	6.7	6.5	6.5	8.3	8.5	7.7	39	109.3
20	OK 101	8.2	9.0	8.3	7.0	7.0	7.0	8.3	7.8	7.8	41	107.2
21	Sturdy 2K	3.7	5.0	4.2	2.0	4.5	4.5	5.7	6.3	4.5	18	53.2
22	TAM 110	0.0	0.0	0.0	0.3	0.0	0.0	3.0	0.0	0.4	6	0.0
23	TAM 111	8.3	6.8	7.7	5.7	6.0	6.0	7.3	7.3	6.9	36	109.0
24	TAM 202	0.0	0.0	0.0	0.7	0.5	0.5	3.0	1.8	0.8	9	0.0
25	TAM 301	7.0	5.8	6.0	2.0	4.5	4.5	4.7	3.3	4.7	20	81.3
26	TAM 302	5.7	3.5	3.2	2.3	3.0	3.0	5.7	4.8	3.9	15	81.0
27	TX96D1073	6.7	3.3	3.5	2.3	4.5	4.5	5.7	5.3	4.5	17	77.2
28	TX98D1170	0.0	0.0	0.0	0.3	0.0	0.0	2.7	0.0	0.4	5	0.0
29	TX98D2334	7.8	6.5	5.5	2.3	6.5	6.5	7.0	7.8	6.2	31	97.7
30	TX98D2423	6.8	5.0	3.2	2.7	4.0	4.0	6.7	5.0	4.7	19	85.7
31	TX99D4151	0.0	0.0	0.0	0.7	0.0	0.0	NR	0.0	0.1	3	10.0
32	TX99D4441	0.0	0.0	0.0	0.3	1.5	1.5	3.3	0.0	0.8	10	4.7
33	TX99D4478	0.0	0.0	0.0	0.3	0.0	0.0	2.3	0.0	0.3	4	0.0
34	TX99D4596	4.7	2.0	0.0	2.0	3.0	3.0	7.0	3.0	3.1	13	56.7
35	AGS 2000	0.0	0.0	0.0	0.0	2.0	2.0	1.0	0.0	0.6	8	8.7
36	NC98-26143	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	0.0
37	Roane	6.8	4.0	4.5	2.7	7.0	7.0	2.7	3.5	4.8	22	85.5
38	Tribute	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.1	2	0.0
39	Thunderbolt	8.2	6.3	5.7	5.7	7.5	7.5	7.0	7.5	6.9	37	109.7
40	Coronado	7.2	5.8	6.5	2.7	6.0	6.0	5.7	7.0	5.9	28	95.7
41	Dumas	7.0	5.3	0.0	3.0	5.5	5.5	7.0	5.8	4.9	23	80.3
	Mean	5.2	4.2	3.5	2.7	4.2	4.2	5.4	4.7	4.3		66.4
	LSD (5%)	1.0	1.6	2.1	1.2	1.1	16.3		30.6	1.1		16.5
	CV (%)	20.6	34.7	29.7	31.7	16.3	1.1		2.0	22.1		20.1

*** Severity ratings are final severities taken at watery-ripe to soft-dough stage. AUC is the area under the PM progress curve in units of severity-days, from 23 Apr to 7 May 2003.**

GLUME BLOTCH

Entry	Designation	Blacksburg VA 0-9	Warsaw VA 0-9	Lexington KY 0-9	StCollege PA 0-9	4 location mean 0-9	rank
1	Cutter	5.0	4.3	1.0	2.5	3.2	17
2	Hondo	3.3	4.0	1.0	2.5	2.7	11
3	Jagalene	6.0	4.7	2.0	2.9	3.9	33
4	Ogallala	5.7	6.3	2.5	3.0	4.4	36
5	2137	5.0	3.0	2.5	2.5	3.3	19
6	2145	4.3	2.7	1.5	2.6	2.8	12
7	Ike	3.7	2.0	1.0	3.8	2.6	9
8	Jagger	4.0	3.0	2.0	2.5	2.9	15
9	Lakin	3.7	1.7	1.0	2.6	2.3	6
10	Stanton	6.0	6.0	1.5	3.6	4.3	35
11	Trego	6.3	3.3	1.0	2.5	3.3	20
12	Arapahoe	5.3	4.3	1.0	3.0	3.4	22
13	Millennium	6.7	6.3	3.0	3.3	4.8	40
14	NuPlains	6.3	3.7	1.0	3.8	3.6	25
15	Vista	7.7	6.3	3.0	1.5	4.6	38
16	Windstar	5.0	4.7	2.0	3.0	3.7	26
17	2174	4.0	5.0	2.0	2.6	3.4	21
18	Custer	5.3	4.7	2.5	2.3	3.7	27
19	Intrada	7.0	5.3	2.0	1.0	3.8	30
20	OK 101	5.3	3.7	3.5	2.6	3.8	29
21	Sturdy 2K	3.0	4.0	3.0	2.8	3.2	18
22	TAM 110	4.3	3.3	2.0	1.5	2.8	13
23	TAM 111	5.0	4.3	2.0	2.6	3.5	23
24	TAM 202	4.7	6.7	2.5	1.0	3.7	28
25	TAM 301	4.0	7.0	3.0	2.5	4.1	34
26	TAM 302	4.0	3.0	2.0	2.5	2.9	16
27	TX96D1073	4.0	1.3	1.0	2.3	2.2	4
28	TX98D1170	5.7	7.0	3.5	3.0	4.8	39
29	TX98D2334	5.3	7.3	3.5	2.4	4.6	37
30	TX98D2423	4.0	2.3	1.0	2.1	2.4	7
31	TX99D4151	3.3	1.3	1.5	2.3	2.1	3
32	TX99D4441	6.7	6.0	1.5	1.4	3.9	32
33	TX99D4478	4.0	7.3	2.0	2.1	3.9	31
34	TX99D4596	3.3	3.0	1.0	1.9	2.2	5
35	AGS 2000	2.7	1.7	1.0	1.8	1.8	1
36	NC98-26143	3.0	4.3	1.0	2.4	2.7	10
37	Roane	3.7	3.0	1.0	2.8	2.6	8
38	Tribute	2.7	1.3	1.0	2.8	2.0	2
39	Thunderbolt	7.7	6.3	3.5	2.6	5.0	41
40	Coronado	4.7	2.7	1.0	2.9	2.8	14
41	Dumas	5.0	4.7	1.5	3.0	3.6	24
	Mean	4.8	4.2	1.9	2.5	3.3	
	LSD (5%)	1.2	1.7		12.6	1.5	
	CV (%)	18.7	29.4		0.4	17.1	

SCAB, LEAF RUST, SOILBORNE MOSAIC

Entry	Designation	Scab Plymouth NC 0-5	Scab St College PA %	Leaf rust Warsaw VA 0-9	SBM Plains GA 0-9
1	Cutter	3.0	35.0	0.0	R
2	Hondo	0.0	0.8	0.0	R
3	Jagalene	1.7	42.5	0.0	R
4	Ogallala	0.7	20.0	0.0	MS
5	2137	2.0	28.8	1.0	R
6	2145	2.0	18.8	0.3	R
7	Ike	0.0	7.5	4.0	R
8	Jagger	2.3	17.5	0.3	R
9	Lakin	1.0	6.3	1.3	R
10	Stanton	1.3	26.3	0.0	S
11	Trego	1.0	21.3	0.0	R
12	Arapahoe	0.0	6.3	0.0	S
13	Millennium	0.0	6.3	0.0	S
14	NuPlains	0.0	6.3	1.3	S
15	Vista	0.0	5.0	1.0	VS
16	Windstar	0.0	5.0	0.3	S
17	2174	1.3	16.3	0.0	R
18	Custer	1.3	13.8	1.0	S
19	Intrada	1.0	30.0	0.0	R
20	OK 101	1.7	43.8	0.0	R
21	Sturdy 2K	1.7	18.8	1.0	R
22	TAM 110	0.0	8.8	1.3	S
23	TAM 111	2.3	37.5	1.7	S
24	TAM 202	1.7	5.0	0.0	S
25	TAM 301	2.7	22.5	3.7	S
26	TAM 302	0.3	6.3	1.0	R
27	TX96D1073	0.3	7.5	0.3	R
28	TX98D1170	0.0	5.0	0.3	MR
29	TX98D2334	0.0	5.0	0.3	R
30	TX98D2423	0.0	6.3	0.3	R
31	TX99D4151	0.3	6.3	0.0	R
32	TX99D4441	2.0	21.3	1.0	S
33	TX99D4478	1.0	5.0	2.0	S
34	TX99D4596	0.3	6.3	0.0	S
35	AGS 2000	1.7	6.3	0.7	S
36	NC98-26143	3.3	26.3	1.0	R
37	Roane	0.7	5.0	4.0	R
38	Tribute	2.0	5.0	0.0	S
39	Thunderbolt	1.7	7.5	0.0	S
40	Coronado	2.3	25.0	2.3	R
41	Dumas	1.0	5.0	0.3	R
	Mean	1.1	14.6	0.8	
	LSD (5%)	1.1	48.1	1.6	
	CV (%)	32.8	9.8	139.5	

SINGLE KERNEL HARDNESS

Entry	Designation	Plains Score	GA Class	Kinston Score	NC Class	Salisbury Score	NC Class	Plymouth Score	NC Class
1	Cutter	83	HARD	80	HARD	78	HARD	82	HARD
2	Hondo	84	HARD	90	HARD	88	HARD	84	HARD
3	Jagalene	78	HARD	77	HARD	79	HARD	81	HARD
4	Ogallala	75	HARD	73	HARD	74	HARD	ps	ps
5	2137	71	HARD	65	HARD	77	HARD	78	HARD
6	2145	66	HARD	64	HARD	71	HARD	71	HARD
7	Ike	73	HARD	71	HARD	66	HARD	73	HARD
8	Jagger	70	HARD	70	HARD	67	HARD	75	HARD
9	Lakin	71	HARD	63	HARD	70	HARD	65	HARD
10	Stanton	64	HARD	58	HARD	60	HARD	57	HARD
11	Trego	68	HARD	64	HARD	73	HARD	70	HARD
12	Arapahoe	73	HARD	81	HARD	72	HARD	86	HARD
13	Millennium	85	HARD	84	HARD	87	HARD	90	HARD
14	NuPlains	71	HARD	80	HARD	70	HARD	82	HARD
15	Vista	79	HARD	79	HARD	80	HARD	88	HARD
16	Windstar	81	HARD	84	HARD	86	HARD	87	HARD
17	2174	79	HARD	76	HARD	78	HARD	81	HARD
18	Custer	76	HARD	64	HARD	71	HARD	69	HARD
19	Intrada	71	HARD	65	HARD	75	HARD	77	HARD
20	OK 101	64	HARD	56	HARD	65	HARD	62	HARD
21	Sturdy 2K	80	HARD	83	HARD	82	HARD	91	HARD
22	TAM 110	80	HARD	61	HARD	69	HARD	79	HARD
23	TAM 111	67	HARD	64	HARD	66	HARD	66	HARD
24	TAM 202	ps*	ps	67	HARD	81	HARD	79	HARD
25	TAM 301	81	HARD	72	HARD	72	HARD	77	HARD
26	TAM 302	70	HARD	74	HARD	76	HARD	73	HARD
27	TX96D1073	62	HARD	61	HARD	66	HARD	68	HARD
28	TX98D1170	66	HARD	54	HARD	73	HARD	67	HARD
29	TX98D2334	63	HARD	49	MIXED	64	HARD	69	HARD
30	TX98D2423	79	HARD	82	HARD	78	HARD	89	HARD
31	TX99D4151	76	HARD	71	HARD	80	HARD	71	HARD
32	TX99D4441	70	HARD	67	HARD	68	HARD	69	HARD
33	TX99D4478	81	HARD	65	HARD	70	HARD	78	HARD
34	TX99D4596	74	HARD	68	HARD	66	HARD	67	HARD
35	AGS 2000	15	SOFT	13	SOFT	13	SOFT	21	SOFT
36	NC98-26143	21	SOFT	18	SOFT	24	SOFT	24	SOFT
37	Roane	28	SOFT	30	SOFT	28	SOFT	41	MIXED
38	Tribute	39	MIXED	33	SOFT	37	SOFT	40	MIXED
39	Thunderbol	71	HARD	66	HARD	66	HARD	67	HARD
40	Coronado	65	HARD	66	HARD	66	HARD	72	HARD
41	Dumas	70	HARD	66	HARD	70	HARD	68	HARD

*** PS=poor seed; would not run in SKH machine.**

SINGLE KERNEL HARDNESS

Entry	Designation	Blacksburg Score	VA Class	Painter bu/ac	VA rank	Warsaw bu/ac	VA rank
1	Cutter	71	HARD	79	HARD	75	HARD
2	Hondo	82	HARD	85	HARD	83	HARD
3	Jagalene	71	HARD	82	HARD	75	HARD
4	Ogallala	70	HARD	73	HARD	57	HARD
5	2137	66	HARD	75	HARD	69	HARD
6	2145	65	HARD	71	HARD	59	HARD
7	Ike	68	HARD	70	HARD	60	HARD
8	Jagger	72	HARD	83	HARD	75	HARD
9	Lakin	66	HARD	69	HARD	67	HARD
10	Stanton	64	HARD	65	HARD	56	HARD
11	Trego	63	HARD	73	HARD	62	HARD
12	Arapahoe	66	HARD	78	HARD	68	HARD
13	Millennium	71	HARD	80	HARD	74	HARD
14	NuPlains	61	HARD	77	HARD	59	HARD
15	Vista	64	HARD	76	HARD	66	HARD
16	Windstar	66	HARD	80	HARD	80	HARD
17	2174	80	HARD	83	HARD	76	HARD
18	Custer	70	HARD	75	HARD	69	HARD
19	Intrada	62	HARD	74	HARD	63	HARD
20	OK 101	58	HARD	70	HARD	62	HARD
21	Sturdy 2K	81	HARD	83	HARD	87	HARD
22	TAM 110	60	HARD	72	HARD	67	HARD
23	TAM 111	65	HARD	70	HARD	65	HARD
24	TAM 202	70	HARD	82	HARD	75	HARD
25	TAM 301	72	HARD	77	HARD	73	HARD
26	TAM 302	68	HARD	79	HARD	69	HARD
27	TX96D1073	63	HARD	64	HARD	57	HARD
28	TX98D1170	65	HARD	71	HARD	64	HARD
29	TX98D2334	67	HARD	69	HARD	59	HARD
30	TX98D2423	69	HARD	83	HARD	79	HARD
31	TX99D4151	73	HARD	79	HARD	69	HARD
32	TX99D4441	63	HARD	77	HARD	66	HARD
33	TX99D4478	65	HARD	74	HARD	66	HARD
34	TX99D4596	63	HARD	76	HARD	67	HARD
35	AGS 2000	10	SOFT	21	SOFT	17	SOFT
36	NC98-26143	19	SOFT	25	SOFT	19	SOFT
37	Roane	28	SOFT	38	MIXED	33	SOFT
38	Tribute	32	SOFT	40	SOFT	36	SOFT
39	Thunderbolt	60	HARD	68	HARD	53	MIXED
40	Coronado	71	HARD	71	HARD	68	HARD
41	Dumas	70	HARD	79	HARD	71	HARD

FLOUR PROTEIN

Entry #	Designation	Plains GA %	Kinston NC %	Plymouth NC %	Salisbury NC %	StCollege PA %	Bksburg VA %	Painter VA %	Warsaw VA %	*8-location mean* %	*rank*
1	Cutter	11.20	11.22	12.68	11.02	13.68	12.05	12.42	12.45	12.09	*13*
2	Hondo	13.01	12.16	14.48	11.90	12.05	12.33	12.54	12.46	12.62	*4*
3	Jagalene	11.35	11.48	12.52	11.37	12.29	11.69	12.78	12.42	11.99	*18*
4	Ogallala	12.89	12.33	13.72	13.09	12.86	13.23	12.91	15.23	13.28	*2*
5	2137	10.26	10.37	11.12	10.29	11.30	10.68	11.21	11.27	10.81	*36*
6	2145	11.96	11.78	11.95	12.34	12.31	12.31	12.48	13.48	12.33	*7*
7	Ike	11.65	11.68	12.56	11.17	12.90	12.06	13.48	12.16	12.21	*10*
8	Jagger	11.04	10.92	11.46	11.74	12.98	11.29	12.60	12.55	11.82	*23*
9	Lakin	10.38	10.79	10.70	10.98	11.29	11.55	12.19	12.25	11.27	*33*
10	Stanton	11.60	10.97	11.85	12.06	12.16	11.71	12.02	12.19	11.82	*24*
11	Trego	11.52	10.75	11.43	11.52	11.74	11.25	11.64	11.87	11.46	*30*
12	Arapahoe	11.16	12.15	12.04	12.08	12.04	11.84	12.46	12.52	12.04	*15*
13	Millennium	12.22	12.08	12.12	10.97	11.88	12.20	12.44	11.99	11.99	*19*
14	NuPlains	11.32	12.15	11.61	11.58	12.18	11.88	12.42	12.48	11.95	*21*
15	Vista	14.06	14.07	13.61	12.36	13.19	13.07	13.71	13.60	13.46	*1*
16	Windstar	11.81	12.32	11.79	11.60	12.09	10.85	11.94	12.33	11.84	*22*
17	2174	11.80	11.49	12.08	11.52	12.95	12.45	12.25	13.04	12.20	*11*
18	Custer	11.54	11.45	11.65	11.19	12.35	11.53	11.37	12.28	11.67	*27*
19	Intrada	12.00	11.41	12.96	10.83	13.45	12.71	12.72	13.85	12.49	*6*
20	OK 101	10.62	10.38	11.71	10.91	11.70	11.55	11.43	12.51	11.35	*31*
21	Sturdy 2K	10.12	11.54	12.13	11.41	11.24	11.27	11.21	11.71	11.33	*32*
22	TAM 110	11.29	10.98	12.39	10.62	12.39	11.53	12.27	11.99	11.68	*26*
23	TAM 111	11.79	11.11	11.37	10.58	11.69	11.93	11.77	12.18	11.55	*29*
24	TAM 202	12.32	10.92	12.72	11.21	11.02	12.39	12.19	13.55	12.04	*16*
25	TAM 301	11.85	11.06	12.00	10.96	13.02	12.07	12.49	12.63	12.01	*17*
26	TAM 302	10.91	11.16	12.98	10.86	12.17	10.91	11.60	11.91	11.56	*28*
27	TX96D1073	11.24	11.78	13.02	11.63	12.92	12.27	12.47	12.61	12.24	*9*
28	TX98D1170	11.39	11.45	12.04	11.46	12.94	12.00	12.97	12.91	12.14	*12*
29	TX98D2334	10.49	10.11	11.14	10.75	11.21	10.22	11.30	11.31	10.82	*35*
30	TX98D2423	10.34	11.06	11.01	9.53	13.43	9.83	10.76	10.30	10.78	*37*
31	TX99D4151	11.43	11.37	12.81	12.30	12.80	11.95	12.51	12.91	12.26	*8*
32	TX99D4441	11.08	11.31	12.70	11.33	12.28	11.66	11.94	11.77	11.76	*25*
33	TX99D4478	11.36	12.04	13.43	13.23	13.15	11.57	13.24	13.47	12.69	*3*
34	TX99D4596	12.70	11.28	11.82	11.38	12.69	12.68	12.08	11.86	12.06	*14*
35	AGS 2000	9.63	9.55	10.50	9.46	10.52	10.14	10.01	10.22	10.00	*40*
36	NC98-26143	9.38	9.83	10.80	10.31	9.93	9.86	10.07	10.36	10.07	*39*
37	Roane	8.89	9.79	9.61	9.85	10.92	9.37	10.38	9.76	9.82	*41*
38	Tribute	8.90	9.39	10.30	10.01	10.94	10.52	11.05	10.49	10.20	*38*
39	Thunderbolt	12.23	12.77	12.42	11.49	13.06	12.17	12.67	13.64	12.56	*5*
40	Coronado	10.88	11.94	12.74	11.29	12.31	11.88	12.44	12.48	11.99	*20*
41	Dumas	10.98	10.42	10.62	10.86	11.40	11.04	11.96	11.47	11.09	*34*
	Mean	11.28	11.29	12.01	11.24	12.18	11.60	12.06	12.26	11.74	
	LSD (5%)	—	—	—	—	—	—	—	—	0.50	
	CV (%)	—	—	—	—	—	—	—	—	4.30	

FLOUR FALLING NUMBER

Entry #	Designation	Plains GA	Kinston NC	Plymouth NC	Salisbury NC	StCollege PA	Bksburg VA	Painter VA	Warsaw VA	*8-location mean*	
		s	s	s	s	s	s	s	s	*s*	*rank*
1	Cutter	457	518	614	474	305	388	567	523	481	*18*
2	Hondo	400	524	766	460	348	498	516	506	502	*8*
3	Jagalene	448	518	489	463	417	430	533	473	471	*22*
4	Ogallala	448	534	582	519	419	488	548	569	513	*5*
5	2137	451	487	572	450	442	510	539	541	499	*9*
6	2145	486	510	607	543	407	480	547	646	528	*2*
7	Ike	395	434	473	357	190	321	420	467	382	*37*
8	Jagger	527	513	582	419	367	274	597	602	485	*15*
9	Lakin	253	441	465	161	255	232	483	393	335	*40*
10	Stanton	320	424	455	362	280	342	473	435	386	*35*
11	Trego	195	359	432	236	233	250	504	318	316	*41*
12	Arapahoe	395	547	570	401	367	478	555	559	484	*16*
13	Millennium	371	512	564	351	358	526	512	586	473	*21*
14	NuPlains	399	591	543	371	333	407	559	533	467	*23*
15	Vista	411	621	594	421	373	430	582	599	504	*7*
16	Windstar	366	687	544	434	348	432	575	543	491	*13*
17	2174	435	495	486	469	402	511	541	532	484	*17*
18	Custer	414	400	438	447	340	439	484	500	433	*29*
19	Intrada	298	367	620	202	274	112	570	495	367	*38*
20	OK 101	360	352	441	245	211	207	449	471	342	*39*
21	Sturdy 2K	539	548	720	462	511	569	598	656	575	*1*
22	TAM 110	473	523	639	470	407	453	572	600	517	*4*
23	TAM 111	454	469	533	415	394	468	519	568	478	*19*
24	TAM 202	421	372	519	325	402	176	566	638	427	*30*
25	TAM 301	343	454	546	324	274	380	474	684	435	*26*
26	TAM 302	456	547	702	484	378	452	505	529	507	*6*
27	TX96D1073	284	396	568	370	268	476	257	462	385	*36*
28	TX98D1170	444	441	512	493	392	529	503	594	489	*14*
29	TX98D2334	446	476	525	460	330	546	489	511	473	*20*
30	TX98D2423	420	438	466	448	269	489	450	486	433	*28*
31	TX99D4151	464	454	557	473	373	546	567	558	499	*10*
32	TX99D4441	421	441	453	369	415	470	457	498	441	*25*
33	TX99D4478	445	492	511	494	353	544	549	567	494	*12*
34	TX99D4596	425	436	543	440	301	389	548	523	451	*24*
35	AGS 2000	407	442	458	314	366	456	477	491	426	*31*
36	NC98-26143	254	412	439	400	356	399	440	459	395	*33*
37	Roane	393	393	447	393	345	444	455	495	421	*32*
38	Tribute	403	438	469	394	386	472	443	464	434	*27*
39	Thunderbolt	437	595	587	436	390	492	499	555	499	*11*
40	Coronado	498	392	502	267	297	249	497	437	392	*34*
41	Dumas	503	477	506	530	392	478	584	689	520	*3*
	Mean	409	475	538	404	348	420	512	531	455	
	LSD (5%)	—	—	—	—	—	—	—	—	59	
	CV (%)	—	—	—	—	—	—	—	—	13	

GRAIN WEIGHT

Entry #	Designation	Plains GA mg	Kinston NC mg	Plymouth NC mg	Salisbury NC mg	StCollege PA mg	Bksburg VA mg	Painter VA mg	Warsaw VA mg	*8-location mean* mg	*rank*
1	Cutter	25.78	24.05	21.51	25.93	25.09	22.36	29.48	25.29	24.94	*26*
2	Hondo	22.67	22.16	18.40	28.64	28.74	24.20	29.82	28.87	25.44	*23*
3	Jagalene	30.50	28.60	24.45	26.31	26.72	23.21	31.05	28.79	27.45	*17*
4	Ogallala	23.21	19.58	nd	20.81	22.73	19.78	25.31	19.29	21.18	*39*
5	2137	31.43	26.72	24.76	30.65	24.48	26.99	33.59	27.84	28.31	*12*
6	2145	24.00	21.98	20.29	21.57	23.61	20.72	28.71	21.70	22.82	*38*
7	Ike	28.45	27.26	25.64	29.21	30.87	25.87	32.94	28.92	28.64	*7*
8	Jagger	28.01	29.50	25.80	25.82	25.30	24.18	28.20	29.57	27.05	*19*
9	Lakin	30.02	26.07	25.75	26.95	29.05	26.88	32.60	26.08	27.92	*13*
10	Stanton	23.96	25.71	21.75	22.89	28.15	20.89	33.17	25.94	25.31	*25*
11	Trego	28.21	26.28	24.44	24.51	26.85	25.23	34.47	27.45	27.18	*18*
12	Arapahoe	22.58	22.75	21.40	25.91	27.31	22.70	29.74	26.87	24.91	*27*
13	Millennium	19.37	22.48	21.62	27.38	27.19	22.46	29.71	27.37	24.70	*28*
14	NuPlains	22.51	23.70	22.78	26.73	24.55	21.74	28.26	25.53	24.47	*32*
15	Vista	18.31	24.04	23.73	26.95	24.63	21.87	28.83	25.75	24.26	*35*
16	Windstar	20.79	22.19	22.30	25.59	25.09	24.12	28.75	25.69	24.31	*34*
17	2174	27.79	24.69	23.34	25.93	26.36	21.50	29.68	23.50	25.35	*24*
18	Custer	30.31	30.17	24.62	29.46	27.05	25.16	33.35	28.54	28.58	*9*
19	Intrada	21.55	19.38	19.41	22.59	nd	19.12	24.58	19.47	20.85	*41*
20	OK 101	28.92	26.04	24.44	24.62	28.14	22.48	30.21	23.78	26.08	*22*
21	Sturdy 2K	30.12	22.49	21.35	25.73	24.77	20.50	30.05	22.26	24.66	*30*
22	TAM 110	25.58	28.98	25.95	28.96	26.31	28.15	34.99	28.58	28.44	*10*
23	TAM 111	25.46	24.28	23.11	25.66	24.45	21.17	30.20	22.99	24.66	*31*
24	TAM 202	nd	24.15	21.50	23.44	26.25	22.49	27.41	21.16	23.08	*37*
25	TAM 301	26.60	26.25	24.61	28.91	25.75	24.34	33.01	24.93	26.80	*20*
26	TAM 302	31.36	25.59	23.81	27.53	26.16	24.55	34.31	28.09	27.67	*16*
27	TX96D1073	31.22	27.86	24.18	27.23	26.64	23.21	32.66	29.81	27.85	*14*
28	TX98D1170	31.37	28.55	26.71	27.58	28.49	23.25	30.95	25.59	27.81	*15*
29	TX98D2334	26.70	29.17	26.99	30.41	29.03	26.48	36.38	29.26	29.30	*5*
30	TX98D2423	30.84	28.37	26.98	30.24	23.18	25.16	32.75	31.59	28.64	*8*
31	TX99D4151	26.59	23.21	19.83	21.62	23.84	22.55	25.63	23.14	23.30	*36*
32	TX99D4441	27.98	29.48	26.72	29.42	26.07	26.51	32.75	28.51	28.43	*11*
33	TX99D4478	29.74	32.68	29.47	30.93	31.82	29.60	34.81	31.79	31.35	*2*
34	TX99D4596	20.81	20.74	18.24	19.82	20.80	21.94	24.18	21.01	20.94	*40*
35	AGS 2000	31.37	34.64	31.95	34.24	31.69	30.68	38.75	34.55	33.48	*1*
36	NC98-26143	29.11	32.48	28.56	29.21	27.54	27.64	31.30	32.08	29.74	*4*
37	Roane	28.55	27.98	23.27	26.13	25.49	25.09	27.60	25.60	26.21	*21*
38	Tribute	23.09	30.52	26.85	32.27	31.66	27.71	33.57	33.12	29.85	*3*
39	Thunderbolt	24.36	24.13	24.46	25.58	23.40	21.43	30.57	23.61	24.69	*29*
40	Coronado	31.84	28.99	26.79	30.53	26.31	26.10	32.50	29.88	29.12	*6*
41	Dumas	25.57	24.28	23.49	25.52	24.08	23.11	26.65	22.92	24.45	*33*
	Mean	26.67	26.05	24.03	26.81	26.39	23.98	30.82	26.50	26.37	
	LSD (5%)	—	—	—	—	—	—	—	—	1.89	
	CV (%)	—	—	—	—	—	—	—	—	6.96	

GRAIN DIAMETER

Entry #	Designation	Plains GA mm	Kinston NC mm	Plymouth NC mm	Salisbury NC mm	StCollege PA mm	Bksburg VA mm	Painter VA mm	Warsaw VA mm	*8-location mean* mm	*rank*
1	Cutter	2.10	1.99	1.94	2.16	2.12	1.91	2.21	2.05	2.06	*29*
2	Hondo	1.97	1.92	1.72	2.29	2.30	2.05	2.34	2.28	2.11	*26*
3	Jagalene	2.41	2.28	2.10	2.25	2.25	2.05	2.41	2.33	2.26	*8*
4	Ogallala	2.03	1.84	nd	1.91	2.06	1.85	2.10	1.78	1.92	*39*
5	2137	2.41	2.10	2.07	2.37	2.13	2.18	2.44	2.19	2.24	*10*
6	2145	2.06	2.00	1.88	1.96	2.10	1.90	2.29	1.93	2.01	*37*
7	Ike	2.22	2.16	2.10	2.26	2.45	2.12	2.41	2.25	2.25	*9*
8	Jagger	2.21	2.29	2.17	2.15	2.19	2.17	2.28	2.31	2.22	*14*
9	Lakin	2.27	2.10	2.06	2.15	2.32	2.14	2.38	2.15	2.19	*19*
10	Stanton	2.05	2.07	1.90	2.02	2.38	2.00	2.40	2.15	2.12	*25*
11	Trego	2.22	2.07	2.01	2.08	2.22	2.10	2.46	2.21	2.17	*20*
12	Arapahoe	1.94	1.92	1.85	2.07	2.21	1.96	2.23	2.10	2.04	*32*
13	Millennium	1.75	1.91	1.87	2.15	2.15	1.87	2.23	2.08	2.00	*38*
14	NuPlains	1.95	1.98	1.95	2.15	2.08	1.90	2.22	2.05	2.03	*34*
15	Vista	1.74	2.03	2.06	2.15	2.10	1.90	2.22	2.12	2.04	*33*
16	Windstar	1.88	1.91	1.92	2.17	2.15	2.01	2.25	2.12	2.05	*31*
17	2174	2.33	2.18	2.12	2.21	2.32	2.04	2.36	2.10	2.21	*15*
18	Custer	2.36	2.38	2.05	2.30	2.25	2.15	2.46	2.27	2.28	*6*
19	Intrada	1.92	1.83	1.86	2.04	nd	1.86	2.03	1.80	1.91	*40*
20	OK 101	2.28	2.16	2.04	2.05	2.33	1.99	2.32	1.97	2.14	*24*
21	Sturdy 2K	2.32	2.02	1.94	2.17	2.16	1.94	2.29	1.98	2.10	*28*
22	TAM 110	2.09	2.24	2.15	2.18	2.12	2.19	2.41	2.20	2.20	*18*
23	TAM 111	2.03	2.02	1.93	2.07	2.13	1.87	2.25	1.95	2.03	*35*
24	TAM 202	nd	2.02	1.93	2.03	2.27	2.01	2.23	1.93	2.06	*30*
25	TAM 301	2.27	2.26	2.17	2.42	2.27	2.24	2.57	2.20	2.30	*5*
26	TAM 302	2.34	2.16	2.06	2.19	2.21	2.11	2.42	2.20	2.21	*16*
27	TX96D1073	2.38	2.27	2.03	2.21	2.23	2.03	2.44	2.34	2.24	*11*
28	TX98D1170	2.32	2.21	2.09	2.16	2.26	1.94	2.26	2.06	2.16	*21*
29	TX98D2334	2.21	2.30	2.21	2.43	2.43	2.26	2.65	2.31	2.35	*3*
30	TX98D2423	2.39	2.25	2.27	2.42	1.97	2.13	2.38	2.39	2.27	*7*
31	TX99D4151	2.19	2.05	1.85	1.98	2.10	1.97	2.05	1.98	2.02	*36*
32	TX99D4441	2.24	2.35	2.18	2.26	2.18	2.11	2.41	2.19	2.24	*12*
33	TX99D4478	2.35	2.45	2.30	2.40	2.51	2.33	2.48	2.39	2.40	*1*
34	TX99D4596	1.88	1.85	1.71	1.81	1.89	1.89	1.98	1.86	1.86	*41*
35	AGS 2000	2.29	2.41	2.26	2.40	2.32	2.21	2.49	2.38	2.34	*4*
36	NC98-26143	2.18	2.32	2.16	2.20	2.19	2.11	2.23	2.32	2.21	*17*
37	Roane	2.30	2.20	1.98	2.18	2.19	2.06	2.23	2.11	2.16	*22*
38	Tribute	1.88	2.25	2.07	2.36	2.35	2.16	2.41	2.37	2.23	*13*
39	Thunderbolt	2.10	2.06	2.08	2.19	2.11	1.94	2.38	2.02	2.11	*27*
40	Coronado	2.44	2.37	2.22	2.43	2.30	2.27	2.45	2.37	2.36	*2*
41	Dumas	2.19	2.12	2.09	2.23	2.23	2.08	2.23	2.04	2.15	*23*
	Mean	2.16	2.13	2.03	2.19	2.21	2.05	2.32	2.14	2.15	
	LSD (5%)	—	—	—	—	—	—	—	—	0.10	
	CV (%)	—	—	—	—	—	—	—	—	4.27	

HARDNESS SCORE

Entry #	Designation	Plains GA mm	Kinston NC mm	Plymouth NC mm	Salisbury NC mm	StCollege PA mm	Bksburg VA mm	Painter VA mm	Warsaw VA mm	*8-location mean* mm	*rank*
1	Cutter	83	80	82	78	75	71	79	75	78	*7*
2	Hondo	84	90	84	88	76	82	85	83	84	*1*
3	Jagalene	78	77	81	79	69	71	82	75	77	*8*
4	Ogallala	75	73	nd	74	72	70	73	57	71	*16*
5	2137	71	65	78	77	64	66	75	69	71	*19*
6	2145	66	64	71	71	66	65	71	59	67	*29*
7	Ike	73	71	73	66	63	68	70	60	68	*26*
8	Jagger	70	70	75	67	71	72	83	75	73	*15*
9	Lakin	71	63	65	70	59	66	69	67	66	*30*
10	Stanton	64	58	57	60	60	64	65	56	61	*37*
11	Trego	68	64	70	73	62	63	73	62	67	*28*
12	Arapahoe	73	81	86	72	61	66	78	68	73	*14*
13	Millennium	85	84	90	87	69	71	80	74	80	*3*
14	NuPlains	71	80	82	70	60	61	77	59	70	*20*
15	Vista	79	79	88	80	65	64	76	66	75	*12*
16	Windstar	81	84	87	86	65	66	80	80	79	*5*
17	2174	79	76	81	78	75	80	83	76	79	*6*
18	Custer	76	64	69	71	66	70	75	69	70	*21*
19	Intrada	71	65	77	75	nd	62	74	63	69	*23*
20	OK 101	64	56	62	65	56	58	70	62	62	*36*
21	Sturdy 2K	80	83	91	82	79	81	83	87	83	*2*
22	TAM 110	80	61	79	69	70	60	72	67	70	*22*
23	TAM 111	67	64	66	66	67	65	70	65	66	*31*
24	TAM 202	nd	67	79	81	74	70	82	75	76	*9*
25	TAM 301	81	72	77	72	75	72	77	73	75	*11*
26	TAM 302	70	74	73	76	70	68	79	69	73	*13*
27	TX96D1073	62	61	68	66	68	63	64	57	64	*34*
28	TX98D1170	66	54	67	73	68	65	71	64	66	*32*
29	TX98D2334	63	49	69	64	61	67	69	59	64	*35*
30	TX98D2423	79	82	89	78	71	69	83	79	79	*4*
31	TX99D4151	76	71	71	80	81	73	79	69	75	*10*
32	TX99D4441	70	67	69	68	62	63	77	66	68	*27*
33	TX99D4478	81	65	78	70	68	65	74	66	71	*17*
34	TX99D4596	74	68	67	66	70	63	76	67	69	*24*
35	AGS 2000	15	13	21	13	13	10	21	17	15	*41*
36	NC98-26143	21	18	24	24	17	19	25	19	21	*40*
37	Roane	28	30	41	28	32	28	38	33	32	*39*
38	Tribute	39	33	40	37	32	32	40	36	36	*38*
39	Thunderbolt	71	66	67	66	70	60	68	53	65	*33*
40	Coronado	65	66	72	66	67	71	71	68	68	*25*
41	Dumas	70	66	68	70	72	70	79	71	71	*18*
	Mean	69	65	71	68	64	63	71	64	67	
	LSD (5%)	—	—	—	—	—	—	—	—	4	
	CV (%)	—	—	—	—	—	—	—	—	6	