



Plains Grains, Inc.

# 2007 HRW Wheat Quality

Preliminary Report

September 20, 2007

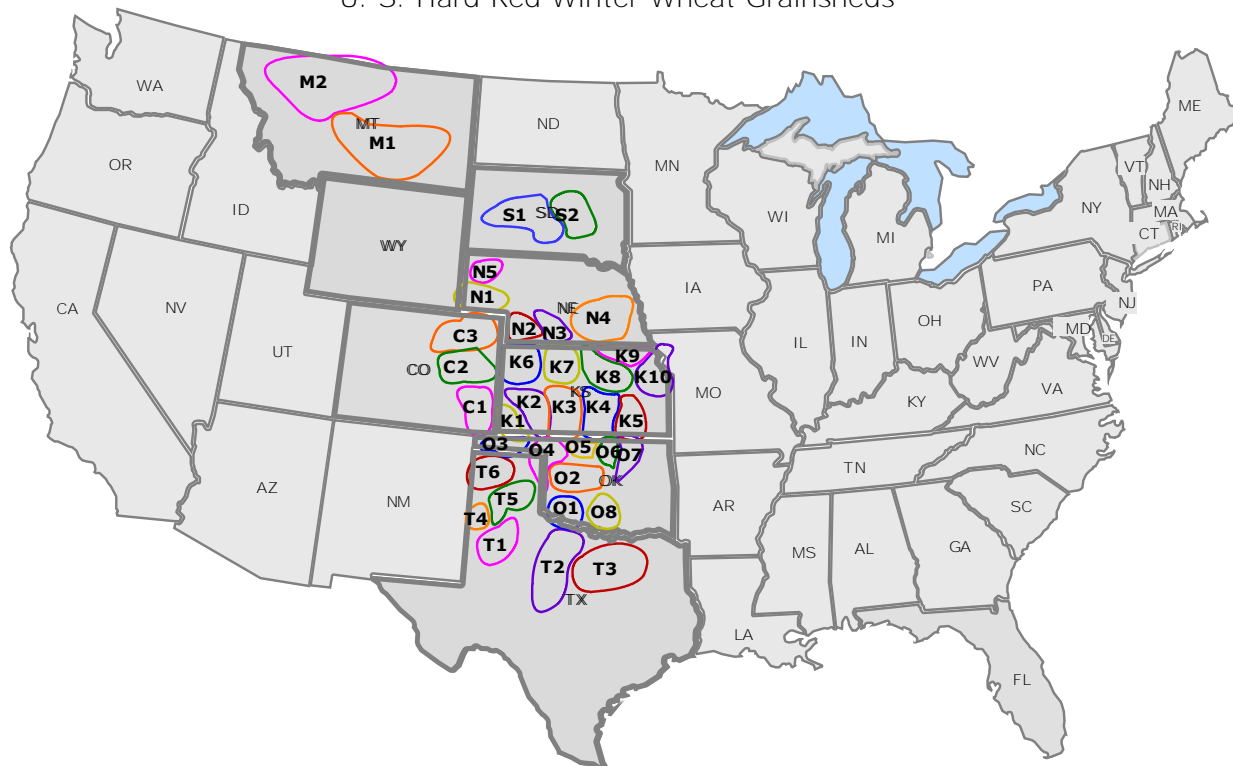


Plains Grains, Inc., (PGI), based out of Stillwater, OK, has been working with U.S. Wheat Associates (USW) and many of the HRW states to conduct the 2007 Wheat Quality Survey. PGI has worked with each state to define reporting districts that are called grainsheds, which are defined by identifying key rail loading facilities and outlining the production region which contributes to each facility's grain supply. By defining reporting districts in this way, PGI is able to create a more accurate description of the wheat quality that will come from a specific regional terminal; thereby giving overseas customers a truer picture of the quality obtained through origin sourcing.

Presently, the HRW wheat crop is surveyed and reported on 36 grainsheds in Texas, Oklahoma, Kansas, Colorado, Nebraska, South Dakota, and Montana ( Figure 1, HRW Grainshed Map). The quality of wheat in these grainsheds is determined by pulling elevator samples from specified locations within each grainshed's boundaries. These samples are then sent to Manhattan, Kansas where samples are tested for wheat grade and non-grade information, and flour data. All samples within a grainshed are then divided into three protein levels, <11.5, 11.5-12.5, and >12.5. The composites of those protein separations are then tested for wheat grade and non-grade information, flour, dough, and bake data. If samples fall within two or more protein levels, an overall composite sample is tested. The composite samples receive more intensive testing than the individual samples. For a full list of the tests performed on all samples, see Table 1. Testing is done by the USDA Hard Winter Wheat Quality Lab, the Kansas State University Wheat Quality Lab, and the Kansas Grains Inspection Service.

Results from this survey can be made available by contacting USW, PGI, or any of the states involved in the survey.

U. S. Hard Red Winter Wheat Grainsheds



**Figure 1: HRW Grainshed Map**

**Survey Brought to You By:**

Colorado Wheat Commission

[www.coloradowheat.org](http://www.coloradowheat.org)

Kansas Wheat Commission

[www.kswheat.com](http://www.kswheat.com)

Montana Wheat and Barley Committee

<http://wbc.agr.state.mt.us>

Nebraska Wheat Commission

[www.nebraskawheat.com](http://www.nebraskawheat.com)

Oklahoma Wheat Commission

[www.wheat.state.ok.us](http://www.wheat.state.ok.us)

South Dakota Wheat Commission

[www.sdwheat.org](http://www.sdwheat.org)

Texas Wheat Producers Board

[www.texaswheat.org](http://www.texaswheat.org)

Wyoming Wheat Marketing Commission

[www.wyomingwheat.com](http://www.wyomingwheat.com)

U. S. Wheat Associates

[www.uswheat.org](http://www.uswheat.org)

Plains Grains, Inc.

[www.plainsgrains.org](http://www.plainsgrains.org)

**Table 1: HRW Wheat Quality Survey Test**

<b>Individual Samples</b>	<b>Composite Samples</b>
<b>Wheat Data</b>	<b>Wheat Data</b>
<b>Official FGIS Grade</b> Test Weight (lb/bu) Test Weight (kg/hl) Dockage (%) Heat Damage (%) Total Damage (%) Foreign Material (%) Shrunken & Broken (%) Total Defects (%) Wheat of Other Classes (%) Wheat of Contrasting Classes (%) <b>Non-Grade Wheat Data</b> Wheat Moisture (%) Wheat Protein (%) 1000 Kernel Weight (gm) Wheat Falling Number (Seconds) Wheat Ash (%)	<b>Official FGIS Grade</b> Test Weight (lb/bu) Test Weight (kg/hl) Dockage (%) Heat Damage (%) Total Damage (%) Foreign Material (%) Shrunken & Broken (%) Total Defects (%) Wheat of Other Classes (%) Wheat of Contrasting Classes (%) <b>Non-Grade Wheat Data</b> Wheat Moisture (%) Wheat Protein (%) 1000 Kernel Weight (gm) Wheat Falling Number (Seconds) Wheat Ash (%) Zeleny Sedimentation (cc) Kernel Size (Sm%/Med%/Lg%) SKCS <b>Flour Data</b> Flour Yield (%) Flour Moisture (%) Flour Protein 14% mb (%) Flour Ash 14% mb (%) Minolta Color Flour Falling Number (Sec) Wet Gluten (%) Gluten Index (%) <b>Dough Quality:</b> Farinograph Alveograph Mixograph <b>Bake Data</b> Loaf Volume (cc) Crumb Grain Score (1-8) Crumb Texture Score (1-8)

State	Grainshed	Wheat Grade		Test Weight (lb/bu)		Test Weight (kg/hl)		Damage Kernels Total		Foreign Material		Shrunken & Broken Kernels		Total Defects	
		'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07
Colorado	C1 Southeast	2	2	60.0	59.9	78.9	78.8	0.1	0.2	0.0	0.0	1.6	1.6	1.7	1.84
	C2 East Central	2	1	59.1	60.3	77.7	79.4	0.2	0.1	0.1	0.1	1.4	1.3	1.7	1.53
	C3 Northeast	2	1	58.8	61.1	77.4	80.4	0.1	0.1	0.0	0.0	1.5	1.5	1.6	1.63
Kansas	K1 Hugoton	2	1	60.0	60.7	78.9	79.8	0.0	0.2	0.0	0.0	1.7	0.7	1.8	0.96
	K2 Garden City	2	1	59.4	60.6	78.2	79.6	0.0	0.3	0.1	0.0	1.0	1.1	1.1	1.44
	K3 Dodge City	2	2	59.3	58.8	78.1	77.4	0.3	0.4	0.0	0.1	1.0	1.8	1.3	2.27
	K4 Great Bend	1	4	61.1	54.0	80.4	71.2	0.2	1.9	0.1	0.5	0.7	3.1	0.9	5.45
	K5 Wichita	1	5	61.1	52.9	80.4	69.8	0.2	2.4	0.1	0.5	0.5	3.4	0.7	6.23
	K6 Colby	2	1	58.2	61.2	76.6	80.5	0.5	0.3	0.1	0.0	0.8	1.1	1.3	1.35
	K7 Hill City	3	2	57.1	59.4	75.1	78.1	0.4	0.5	0.1	0.0	1.0	2.6	1.5	3.15
	K8 Salina	1	2	60.5	58.6	79.6	77.1	0.1	0.5	0.1	0.1	1.4	2.1	1.6	2.68
	K9 Concordia	1	2	60.4	58.7	79.4	77.2	0.3	0.9	0.1	0.0	0.8	2.0	1.2	2.9
Montana	M1 Billings	1	1	62.4	61.0	82.1	80.3	0.0	0.0	0.0	0.0	1.4	2.1	1.4	2.07
	M2 Shelby	1	1	63.8	60.8	83.9	79.9	0.1	0.1	0.0	0.0	0.9	2.1	1.1	2.18
Nebraska	N1 Kimball	2	1	59.2	61.2	77.9	80.5	0.0	0.1	0.1	0.1	1.9	1.9	2.0	1.99
	N2 Imperial	2	1	59.0	61.4	77.7	80.8	0.2	0.1	0.0	0.0	1.1	1.1	1.3	1.14
	N3 North Platte	2	1	59.5	60.8	78.3	80.0	0.3	0.2	0.0	0.0	0.9	1.3	1.2	1.56
	N4 Hastings	1	2	60.8	58.9	80.0	77.5	0.2	1.7	0.1	0.1	0.6	1.9	0.9	3.69
	N5 Chadron	1	1	60.2	60.8	79.2	79.9	0.1	0.0	0.2	0.1	1.8	1.3	2.1	1.42
Oklahoma	O1 Altus	1	1	61.4	60.1	80.7	79.0	0.1	0.1	0.1	0.1	1.2	1.0	1.4	1.16
	O2 Kingfisher	1	2	62.2	58.7	81.8	77.3	0.1	0.2	0.2	0.5	1.1	2.3	1.3	2.99
	O3 Guymon	2	2	59.0	59.7	77.7	78.5	0.3	0.3	0.2	0.0	1.0	1.2	1.6	1.48
	O4 Shattuck	2	3	60.0	57.5	78.9	75.7	0.2	0.8	0.5	1.0	1.9	1.7	2.6	3.46
	O5 Enid/Alva	1	2	61.8	58.0	81.3	76.3	0.1	0.5	0.3	0.3	1.4	2.0	1.8	2.73
	O7 Catoosa	1	4	62.0	55.3	81.5	72.9	0.1	0.2	0.1	1.6	0.9	2.9	1.1	4.70
	O8 Apache	1	3	61.7	57.4	81.2	75.6	0.2	0.3	0.1	0.1	0.9	1.5	1.2	1.85
South Dakota	S1 East Central	1	1	61.8	61.2	81.2	80.5	0.2	0.3	0.1	0.0	1.3	1.1	1.5	1.44
	S2 West Central	1	1	61.6	61.0	81.0	80.2	0.2	0.2	0.0	0.1	1.1	1.7	1.2	2.07
Texas	T1 Lubbock	3	1	60.6	61.8	79.7	81.3	0.1	0.1	1.3	0.0	1.4	0.8	2.8	0.93
	T2 Abilene	1	2	61.6	58.3	81.0	76.7	0.2	0.2	0.0	0.1	1.6	1.5	1.8	1.70
	T3 Fort Worth	2	2	60.0	59.0	78.9	77.6	0.1	0.5	0.0	0.1	1.3	0.9	1.4	1.50
	T4 Hereford	2	1	59.2	61.3	77.9	80.6	0.2	0.2	0.3	0.1	1.5	1.0	2.0	1.39
	T5 Amarillo	2	1	59.2	61.8	77.9	81.3	0.2	0.1	0.3	0.0	1.5	0.9	2.0	1.05
	T6 Sunray	2	1	58.6	60.6	77.2	79.7	0.3	0.4	0.1	0.0	1.7	1.1	2.1	1.47

		Wheat Non-Grade Data													
State	Grainshed	Dockage (%)		Moisture (%)		Protein (12% mb)		Ash (12% mb)		Falling Number (sec)		Zeleny Sedimentation		Thousand Kernel (g)	
		'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07
Colorado	C1 Southeast	0.6	0.7	9.9	10.4	13.8	10.2	1.5	1.5	375	467	38	32.5	26.4	31.2
	C2 East Central	0.9	1.2	11.5	9.8	14.1	11.1	1.6	1.6	392	432	47	34.0	25.9	28.4
	C3 Northeast	0.5	0.4	11.9	10.6	14.3	11.5	1.5	1.6	402	454	50	34.5	23.7	30.8
Kansas	K1 Hugoton	0.7	0.4	9.7	11.9	14.0	10.3	1.6	1.5	360	411	47	32.5	26.4	30.6
	K2 Garden City	0.4	0.5	11.1	11.9	14.8	10.8	1.7	1.6	362	435	63	37.0	25.1	28.4
	K3 Dodge City	0.3	0.7	10.8	11.9	14.9	11.4	1.5	1.6	370	414	63	40.5	27.4	24.1
	K4 Great Bend	0.6	1.7	12.2	12.1	13.9	12.5	1.5	1.8	395	384	58	41.5	32.8	20.3
	K5 Wichita	0.3	1.1	12.0	12.1	12.9	12.1	1.6	1.7	360	264	51	43.0	34.4	18.2
	K6 Colby	0.4	0.5	11.5	11.9	15.1	11.0	1.5	1.6	443	434	59	34.8	26.3	26.4
	K7 Hill City	0.5	0.5	9.8	11.9	14.6	11.1	1.7	1.7	426	430	47	36.5	25.8	24.6
	K8 Salina	0.3	0.6	11.4	12.2	13.0	12.1	1.5	1.6	404	424	N/A	40.0	30.4	23.2
	K9 Concordia	0.6	0.8	10.9	12.2	13.9	11.7	1.7	1.6	414	425	51	38.0	28.7	25.1
Montana	M1 Billings	0.6	1.2	8.9	10.4	13.2	11.2	1.5	1.5	403	472	38	35.5	26.6	26.7
	M2 Shelby	0.4	0.5	9.5	10.4	12.0	12.7	1.5	1.5	383	482	40	38.5	31.3	25.6
Nebraska	N1 Kimball	0.5	0.6	13.0	9.9	12.2	12.2	1.4	1.5	337	442	39	38.3	24.5	27.2
	N2 Imperial	0.5	0.3	10.0	11.6	14.7	11.5	1.5	1.6	388	411	55	34.8	25.2	29.5
	N3 North Platte	0.3	0.5	11.4	11.8	12.7	11.9	1.5	1.6	422	444	39	36.5	28.7	24.2
	N4 Hastings	0.5	0.9	12.0	11.4	13.3	12.2	1.6	1.7	385	419	42	38.0	28.3	25.9
	N5 Chadron	1	0.6	11.4	9.6	12.6	12.6	1.5	1.7	380	430	48	40.5	25.3	26.5
Oklahoma	O1 Altus	0.8	0.5	11.9	12.5	13.8	11.7	1.5	1.5	383	392	57	41.0	25.7	31.9
	O2 Kingfisher	0.4	0.5	11.5	11.4	13.3	11.9	1.5	1.7	394	423	49	41.3	25.3	22.9
	O3 Guymon	0.8	1.7	10.6	12.3	15.1	11.3	1.6	1.4	354	415	55	37.0	20.5	28.4
	O4 Shattuck	0.7	0.9	10.0	12.6	15.4	11.0	1.6	1.5	404	323	40	36.0	25.8	26.6
	O5 Enid/Alva	0.7	0.9	11.3	11.8	12.1	12.7	1.4	1.6	406	452	30	37.0	28.8	22.2
	O7 Catoosa	0.3	1.3	11.0	12.1	13.3	13.2	1.4	1.8	382	428	38	43.0	30.7	19.5
	O8 Apache	0.4	0.7	11.4	12.5	13.1	12.2	1.5	1.6	388	408	39	38.0	30.4	25.3
South Dakota	S1 East Central	0.4	0.5	10.5	12.2	13.4	12.2	1.5	1.7	418	459	42	40.8	28.3	30.2
	S2 West Central	0.6	0.5	11.1	11.1	12.4	12.4	1.6	1.6	419	397	40	40.0	26.7	28.4
Texas	T1 Lubbock	1	0.8	9.5	11.8	14.4	11.3	1.5	1.5	445	439	29	31.0	25.5	31.4
	T2 Abilene	0.7	0.7	12.3	12.3	13.0	11.2	1.5	1.6	347	375	54	41.0	32.0	29.0
	T3 Fort Worth	2.1	0.4	11.5	12.1	13.0	11.5	1.5	1.5	330	336	22	39.0	23.9	30.5
	T4 Hereford	0.8	0.6	9.6	10.9	15.0	12.4	1.6	1.6	402	445	44	31.0	29.3	30.7
	T5 Amarillo	0.8	0.6	9.6	12.0	15.0	11.0	1.6	1.5	402	387	44	32.5	29.3	33.3
	T6 Sunray	0.9	1.1	10.3	11.9	15.7	11.8	1.8	1.5	359	461	54	35.0	24.0	27.5

				SKCS								
State	Grainshed		Kernel Size (SM/MD/LG)		Hardness		Moisture (%)		Kernel Weight (mg)		Kernel Size (mm)	
			'06	'07	'06	'07	'06	'07	'06	'07	'06	'07
Colorado	C1	Southeast	2/53/45	2/36/62	75	68.1	10.2	10.7	29.2	28.6	2.2	2.15
	C2	East Central	2/61/37	1/40/59	67	69.4	12.2	9.7	27.5	26.6	2.1	2.01
	C3	Northeast	3/69/28	1/40/59	72	68.9	12.5	10.9	24.4	29.7	2.0	2.20
Kansas	K1	Hugoton	1/51/48	1/32/67	78	63.9	9.8	11.8	27.4	30.0	2.1	2.25
	K2	Garden City	1/55/44	1/36/63	78	72.2	11.0	12.3	27.1	28.0	2.2	2.19
	K3	Dodge City	1/46/53	2/46/52	78	68.2	10.7	12.5	24.8	26.8	2.1	2.10
	K4	Great Bend	1/20/79	7/57/36	69	61.9	12.8	12.5	32.8	23.0	2.4	1.90
	K5	Wichita	0/19/81	10/67/23	70	58.9	12.9	12.7	34.1	22.5	2.6	1.88
	K6	Colby	1/53/46	2/41/57	70	71.3	11.9	12.1	29.0	30.6	2.2	2.27
	K7	Hill City	1/50/49	3/45/52	65	69.9	10.5	12.1	28.2	25.7	2.2	2.04
	K8	Salina	1/34/65	3/50/47	68	66.1	11.9	13.0	31.0	25.7	2.3	2.07
	K9	Concordia	1/38/61	3/44/53	59	63.8	11.0	12.4	31.1	26.6	2.3	2.09
Montana	M1	Billings	2/49/49	2/46/52	75	65.4	7.8	10.0	29.3	30.1	2.3	2.21
	M2	Shelby	1/36/63	3/54/43	73	70.8	9.5	10.1	31.6	27.5	2.4	2.06
Nebraska	N1	Kimball	2/64/34	2/47/51	64	69.0	13.5	9.9	27.7	25.7	2.1	1.97
	N2	Imperial	1/59/40	1/38/61	70	72.6	12.1	11.9	27.8	30.4	2.2	2.26
	N3	North Platte	1/35/64	2/41/57	62	69.0	11.8	12.0	28.8	28.0	2.2	2.16
	N4	Hastings	1/39/60	2/41/57	67	64.8	12.9	11.9	29.7	29.2	2.3	2.26
	N5	Chadron	2/60/38	1/47/52	66	70.5	12.8	9.5	26.6	27.4	2.0	2.12
Oklahoma	O1	Altus	1/54/45	1/36/63	87	60.3	12.8	13.3	27.8	29.2	2.2	2.19
	O2	Kingfisher	1/52/47	4/58/38	86	69.3	12.3	12.8	27.9	25.0	2.2	2.02
	O3	Guymon	1/47/52	1/45/54	76	63.8	11.6	12.7	28.8	28.5	2.2	2.14
	O4	Shattuck	2/53/45	2/37/61	74	59.0	10.0	12.8	27.5	28.9	2.2	2.21
	O5	Enid/Alva	1/32/67	4/56/40	75	74.9	12.0	12.9	31.4	22.7	2.4	1.92
	O7	Catoosa	0/26/74	7/69/24	77	74.3	12.6	12.6	33.4	21.7	2.5	1.86
	O8	Apache	1/28/71	3/51/46	78	58.8	12.8	12.8	32.4	24.9	2.4	1.99
	South Dakota	S1	East Central	1/46/54	1/32/67	70	63.3	11.0	12.4	30.1	32.8	2.3
S2		West Central	1/45/54	2/38/60	70	68.0	11.8	12.2	29.7	29.5	2.2	2.20
Texas	T1	Lubbock	1/44/55	1/28/71	77	70.7	8.8	13.0	28.7	30.7	2.2	2.29
	T2	Abilene	2/59/39	2/36/62	82	58.7	12.7	12.9	27.1	29.6	2.1	2.22
	T3	Fort Worth	2/40/58	1/26/73	50	55.7	12.5	12.5	27.5	31.6	2.1	2.34
	T4	Hereford	2/49/49	1/35/64	75	69.3	9.8	11.6	29.5	30.5	2.3	2.24
	T5	Amarillo	2/49/49	1/25/74	75	69.5	9.8	12.6	29.5	33.5	2.3	2.41
	T6	Sunray	3/58/39	2/40/58	76	68.3	10.9	12.3	26.2	30.1	2.1	2.22

State	Grainshed	Yield (%)		Moisture (%)		Protein (14%)		Ash (14% mb)		Wet Gluten (g)		Gluten Index		Falling Number (sec)	
		'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07
Colorado	C1 Southeast	66.1	68.3	12.2	13.9	12.3	9.4	0.49	1.54	36.4	N/A	89	N/A	502	453
	C2 East Central	63.3	67.0	12.3	14.0	11.7	9.8	0.41	1.63	32.9	27.1	92.5	94.5	456	472
	C3 Northeast	63.6	68.4	12.7	13.9	12.8	10.3	0.53	1.65	38.8	30.0	95.4	87.3	416	443
Kansas	K1 Hugoton	66.5	67.2	12.2	14.2	12.5	9.0	0.52	0.54	36.7	24.5	81	94.9	404	399
	K2 Garden City	68.9	67.2	11.8	14.3	13.0	9.6	0.54	0.57	37.6	26.8	82.9	96.4	469	427
	K3 Dodge City	69.6	67.8	12.4	13.3	13.2	9.9	0.53	0.49	39.0	26.3	89.3	98.7	477	455
	K4 Great Bend	68.6	65.9	12.5	13.4	11.7	10.8	0.50	0.54	33.0	28.5	96.4	98.6	412	334
	K5 Wichita	67.3	65.4	12.9	13.2	12.0	10.5	0.54	0.61	32.3	N/A	96.4	N/A	453	253
	K6 Colby	65.1	68.5	12.7	13.7	12.9	9.9	0.50	0.56	34.4	27.5	94.9	94.6	432	445
	K7 Hill City	67.0	67.8	12.7	13.8	12.9	9.8	0.48	0.57	35.1	N/A	94.7	N/A	494	438
	K8 Salina	68.9	68.9	11.6	13.1	11.9	10.5	0.49	0.52	33.4	28.0	93.8	99.1	430	423
	K9 Concordia	66.9	69.8	12.6	13.0	12.6	10.0	0.45	0.52	34.0	26.8	97.5	98.4	428	453
Montana	M1 Billings	66.9	68.4	12.6	13.9	11.9	10.2	0.45	0.52	26.5	27.9	99.3	95.4	520	473
	M2 Shelby	68.4	67.3	11.4	13.8	10.8	11.7	0.43	0.55	28.6	33.4	97.9	85.8	420	454
Nebraska	N1 Kimball	66.1	67.1	13.2	14.7	10.8	11.2	0.43	0.48	28.6	31.3	94.9	92.7	374	405
	N2 Imperial	66.7	67.1	12.0	14.2	12.4	10.5	0.50	0.54	35.1	29.0	96.1	93.6	558	423
	N3 North Platte	68.8	70.0	12.4	14.1	11.7	10.4	0.48	0.55	35.8	28.1	96.4	95.2	384	406
	N4 Hastings	68.5	68.4	13.2	14.1	11.6	10.6	0.48	0.59	32.7	28.9	97	95.9	468	421
	N5 Chadron	66.7	67.4	13.4	14.2	11.1	11.6	0.40	0.54	30.7	32.1	95.9	94.1	390	412
Oklahoma	O1 Altus	69.7	71.4	12.1	13.2	12.2	10.5	0.54	0.62	34.5	28.6	96	95.4	448	414
	O2 Kingfisher	69.5	67.4	11.8	14.3	12.0	10.5	0.50	0.58	35.0	27.3	90.3	98.5	413	407
	O3 Guymon	68.7	69.5	11.1	13.5	13.4	10.3	0.56	0.56	38.0	27.3	84.6	95.7	539	429
	O4 Shattuck	68.2	69.7	11.8	13.5	13.6	9.4	0.56	0.49	39.8	25.3	77	96.5	444	336
	O5 Enid/Alva	69.4	69.2	11.7	13.5	11.0	10.8	0.46	0.52	31.3	30.7	90.4	94.7	429	432
	O7 Catoosa	68.6	66.7	12.1	14.1	11.7	11.7	0.50	0.58	33.7	32.1	93.7	95.8	374	424
	O8 Apache	68.5	68.0	12.1	13.7	11.4	10.8	0.50	0.57	31.7	29.5	97.8	96.1	397	418
	South Dakota	S1 East Central	67.1	71.0	12.9	14.5	12.0	11.1	0.43	0.51	34.4	29.8	91.1	98.5	446
S2 West Central		68.9	72.8	13.2	12.7	10.7	11.3	0.44	0.58	27.5	31.0	99.4	96.2	405	382
Texas	T1 Lubbock	67.0	69.8	12.5	12.9	12.4	9.9	0.52	0.55	33.8	28.6	88.5	91.7	462	401
	T2 Abilene	69.0	72.2	12.1	13.3	12.0	9.8	0.50	0.61	33.7	N/A	93.4	N/A	402	420
	T3 Fort Worth	70.2	70.6	11.7	12.8	11.0	10.2	0.46	0.58	33.4	27.3	91.4	95.1	404	403
	T4 Hereford	67.5	69.0	11.3	13.1	13.5	10.8	0.54	0.57	38.8	32.1	84.4	84.7	457	416
	T5 Amarillo	67.5	70.6	11.3	13.0	13.5	9.8	0.54	0.55	38.8	29.5	84.4	86.1	457	414
	T6 Sunray	66.5	67.5	11.7	14.1	13.5	10.4	0.56	0.55	40.4	28.8	86	91.2	479	436



			Minolta Color						Farinograph							
State	Grainshed		L*		a*		b*		Absorption (14% mb)		Peak Time (min)		Stability (min)		MTI (BU)	
			'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07
Colorado	C1	Southeast	92.7	92.4	-3.3	-2.02	9.0	11.27	59.4	56.4	6.0	4.7	10.0	7.4	30	34
	C2	East Central	92.7	92.7	-3.3	-1.94	9.3	11.06	57.2	56.8	6.5	4.7	11.0	9.0	35	25
	C3	Northeast	92.2	92.3	-3.1	-1.73	9.6	10.7	57.7	57.9	6.0	5.2	9.5	8.0	35	34
Kansas	K1	Hugoton	92.0	92.1	-2.5	-2.02	8.8	11.34	58.7	55.4	6.0	4.7	10.0	7.4	45	37
	K2	Garden City	92.3	92.1	-2.5	-2.03	8.7	11.43	59.4	55.8	6.5	5.3	11.5	8.2	35	32
	K3	Dodge City	92.3	92.0	-2.5	-2.15	9.3	11.42	60.9	56.2	8.0	4.0	13.5	8.0	30	28
	K4	Great Bend	92.1	91.2	-2.5	-2.04	9.1	11.22	59.4	56.0	7.0	5.0	12.0	8.1	30	37
	K5	Wichita	93.1	91.0	-2.5	-2.02	8.3	11.21	61.9	55.5	7.5	2.7	13.5	6.9	20	25
	K6	Colby	92.4	91.9	-3.0	-2.04	8.3	11.9	59.7	56.8	6.5	4.7	12.0	6.2	20	40
	K7	Hill City	92.6	91.7	-3.1	-1.84	8.4	11.3	58.8	56.4	6.5	5.2	15.0	7.8	25	38
	K8	Salina	92.3	91.4	-2.4	-2.02	8.9	11.24	56.7	56.2	7.0	5.0	13.5	8.9	40	27
	K9	Concordia	92.7	91.9	-3.1	-2.09	8.2	11.15	57.9	55.6	7.0	4.7	15.0	7.1	25	37
Montana	M1	Billings	92.6	92.5	-3.2	-2.28	9.4	10.78	58.4	57.0	6.5	5.2	14.0	7.8	20	28
	M2	Shelby	92.9	92.4	-3.1	-2.27	9.0	11.33	56.1	58.9	7.0	6.2	13.0	9.0	25	27
Nebraska	N1	Kimball	94.3	92.6	-2.6	-1.59	8.8	10.4	56.1	58.1	7.5	6.7	18.0	9.8	15	27
	N2	Imperial	92.5	92.0	-3.0	-1.74	8.2	11.5	57.3	57.7	7.0	5.7	13.5	6.7	30	43
	N3	North Platte	93.6	92.1	-2.5	-1.64	8.3	10.8	55.8	56.4	6.0	4.9	11.0	6.4	40	47
	N4	Hastings	92.7	91.9	-3.1	-1.56	8.1	10.8	56.8	55.6	7.0	4.8	13.5	7.0	30	38
	N5	Chadron	94.3	92.2	-2.7	-1.49	9.1	10.5	55.4	58.5	7.0	6.5	16.0	9.0	30	31
Oklahoma	O1	Altus	92.4	91.9	-2.9	-1.77	9.1	10.56	61.1	55.7	8.5	5.5	14.0	8.7	40	31
	O2	Kingfisher	92.5	91.7	-2.4	-1.62	9.3	11.0	61.3	56.7	7.0	6.0	12.5	8.4	40	33
	O3	Guymon	91.8	92.1	-2.5	-2.04	9.2	11.29	60.6	57.0	6.5	5.0	10.0	7.4	30	30
	O4	Shattuck	92.1	91.9	-3.2	-1.94	9.1	10.44	62.1	55.3	6.5	5.2	10.0	6.6	30	50
	O5	Enid/Alva	92.4	91.6	-3.1	-1.98	8.8	11.38	59.1	57.3	6.5	5.5	11.5	7.6	30	29
	O7	Catoosa	92.3	91.3	-2.7	-1.61	9.0	11.0	61.3	57.6	7.5	6.8	11.0	10.7	35	27
	O8	Apache	92.4	91.9	-2.8	-1.77	8.7	10.53	59.4	55.6	6.5	4.9	11.0	8.1	35	29
	South Dakota	S1	East Central	92.6	92.2	-3.3	-1.39	8.7	10.0	58.4	55.9	8.0	6.0	16.0	11.6	20
S2		West Central	93.7	91.5	-1.7	-1.7	8.9	10.79	55	57.4	8.5	5.3	18.5	7.2	15	38
Texas	T1	Lubbock	92.0	92.2	-2.5	-2.04	8.8	11.36	60.9	57.3	5.5	4.9	8.5	5.4	40	49
	T2	Abilene	92.4	91.4	-2.9	-1.77	9.0	10.29	58.3	55.1	7.5	2.3	15.5	8.5	30	17
	T3	Fort Worth	93.4	91.6	-2.7	-1.69	8.4	10.15	55.4	56.0	4.0	2.3	5.5	9.2	75	14
	T4	Hereford	91.8	91.9	-2.6	-2.01	9.5	11.28	59.6	59.1	6.0	3.7	9.0	5.1	40	42
	T5	Amarillo	91.8	92.1	-2.6	-2.04	9.5	11.54	59.6	57.3	6.0	4.3	9.0	5.5	40	44
	T6	Sunray	91.8	92.2	-2.4	-2.09	8.9	11.81	61.1	57.8	7.0	4.3	11.0	6.7	30	34

			Alveograph							Mixograph						
State	Grainshed		P (mm H2O)		L (mm)		W (10E-4J)		P/L		Absorption (14% mb)		Peak Time (min)		Tolerance	
			'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07
Colorado	C1	Southeast	79	71	111	61	266	145	0.71	1.16	68	59	3.2	3.4	N/A	2
	C2	East Central	82	68	94	87	242	194	0.87	0.78	68	59	3.2	3.4	N/A	2
	C3	Northeast	87	71	118	81	297	192	0.74	0.88	68	60	3.2	3.4	N/A	2
Kansas	K1	Hugoton	75	71	134	56	283	151	0.56	1.27	65	58	2.9	3.0	N/A	2
	K2	Garden City	79	60	143	113	331	199	0.55	0.53	65	59	2.8	3.3	N/A	2
	K3	Dodge City	89	65	140	75	384	169	0.64	0.87	65	59	3.2	3.9	N/A	4
	K4	Great Bend	89	34	126	123	347	130	0.71	0.28	65	57	4.2	4.1	N/A	3
	K5	Wichita	124	35	99	109	407	115	1.25	0.32	66	59	4.5	4.0	N/A	3
	K6	Colby	86	67	135	77	345	170	0.64	0.87	68	59	4.0	2.9	N/A	2
	K7	Hill City	77	59	125	91	310	163	0.62	0.65	68	59	4.2	3.1	N/A	4
	K8	Salina	78	52	104	109	267	177	0.75	0.48	69	60	5	3.9	N/A	3
	K9	Concordia	86	50	111	88	323	143	0.77	0.57	68	60	4.2	3.9	N/A	2
Montana	M1	Billings	91	69	107	103	328	231	0.85	0.67	68	59	4	3.9	N/A	3
	M2	Shelby	83	74	95	108	278	258	0.87	0.69	68	63	4.2	3.9	N/A	4
Nebraska	N1	Kimball	63	58	109	128	249	223	0.58	0.45	68	62	6.0	3.1	N/A	3
	N2	Imperial	80	81	113	76	289	223	0.71	1.07	68	60	3.6	3.3	N/A	3
	N3	North Platte	86	58	116	104	334	175	0.74	0.56	68	60	5.8	2.8	N/A	2
	N4	Hastings	84	62	104	99	295	204	0.81	0.63	68	61	4.7	3.5	N/A	3
	N5	Chadron	78	69	116	107	307	237	0.67	0.64	68	61	6.0	2.8	N/A	2
Oklahoma	O1	Altus	110	51	125	116	423	173	0.88	0.44	69	60	4.1	3.6	N/A	4
	O2	Kingfisher	105	59	129	111	382	203	0.81	0.53	66	61	3.0	3.9	N/A	4
	O3	Guymon	87	60	100	125	286	199	0.87	0.48	69	60	2.6	3.1	N/A	2
	O4	Shattuck	85	53	127	94	309	153	0.67	0.56	68	59	2.4	3.3	N/A	2
	O5	Enid/Alva	125	55	100	107	379	176	1.25	0.51	68	61	4	3.6	N/A	3
	O7	Catoosa	84	69	124	140	350	300	0.68	0.49	69	63	3.7	3.6	N/A	4
	O8	Apache	94	55	103	144	321	224	0.91	0.38	69	61	3.9	3.9	N/A	4
South Dakota	S1	East Central	76	59	123	122	325	253	0.62	0.48	68	61	3.5	3.6	N/A	4
	S2	West Central	78	48	122	93	349	146	0.64	0.52	64	60	6	2.8	N/A	3
Texas	T1	Lubbock	93	61	111	98	292	183	0.84	0.62	65	59	3.0	3.1	N/A	2
	T2	Abilene	71	57	154	115	362	212	0.46	0.5	69	59	4.5	4.6	N/A	4
	T3	Fort Worth	50	45	169	110	213	162	0.3	0.41	66	60	2.8	4.3	N/A	4
	T4	Hereford	83	62	117	115	307	193	0.71	0.54	69	61	2.8	2.4	N/A	2
	T5	Amarillo	83	62	117	99	307	175	0.71	0.63	69	59	2.8	3.3	N/A	2
	T6	Sunray	95	66	112	97	320	186	0.85	0.68	69	60	2.8	3.1	N/A	2

			Bake											
State	Grainshed		Mix Time (min)		Water Absorption (14% mb)		Loaf Volume (cc)		Crumb Grain (0-6)		Crumb Texture (0-6)		Crumb Color	
			'06	'07	'06	'07	'06	'07	'06	'07	'06	'07	'06	'07
Colorado	C1	Southeast	N/A	4.5	N/A	57.5	815	795	7	2.5	7	4	N/A	Dull
	C2	East Central	N/A	5.3	N/A	58.2	935	775	7	3.0	7	4	N/A	Dull
	C3	Northeast	N/A	4.5	N/A	59.6	875	810	6	2.5	8	4	N/A	Dull
Kansas	K1	Hugoton	N/A	5.0	N/A	57.9	850	755	7	1.8	8	4	N/A	Yellow
	K2	Garden City	N/A	5.1	N/A	58.6	900	820	7	2.0	7	4	N/A	Yellow
	K3	Dodge City	N/A	5.0	N/A	59.4	950	840	7	3.0	7	4	N/A	Yellow
	K4	Great Bend	N/A	5.3	N/A	59.3	850	925	6	2.8	7	4	N/A	Yellow
	K5	Wichita	N/A	4.5	N/A	58	785	930	6	4.0	7	4	N/A	Yellow
	K6	Colby	N/A	4.4	N/A	57.3	850	815	7	2.5	7	4	N/A	Yellow
	K7	Hill City	N/A	5.0	N/A	58.5	825	870	7	2.0	6	4	N/A	Yellow
	K8	Salina	N/A	5.5	N/A	60.6	835	885	8	3.0	8	4	N/A	Yellow
	K9	Concordia	N/A	5.0	N/A	59.5	868	865	8	4.5	8	4	N/A	Yellow
Montana	M1	Billings	N/A	4.5	N/A	59.6	925	875	7	3.8	8	4	N/A	Yellow
	M2	Shelby	N/A	4.5	N/A	62.4	900	935	8	3.8	8	4	N/A	Yellow
Nebraska	N1	Kimball	N/A	4.4	N/A	61.6	850	895	6	4.5	6	4	N/A	Dull
	N2	Imperial	N/A	4.8	N/A	59.9	835	825	7	3.5	7	4	N/A	Yellow
	N3	North Platte	N/A	4.1	N/A	59.8	825	875	7	4.0	7	4	N/A	Dull
	N4	Hastings	N/A	5.1	N/A	58.8	725	840	6	3.0	6	3	N/A	Yellow
	N5	Chadron	N/A	4.5	N/A	59.9	1000	890	6	4.5	7	4	N/A	Dull
Oklahoma	O1	Altus	N/A	6.1	N/A	60.8	750	870	7	3.5	7	3	N/A	Yellow
	O2	Kingfisher	N/A	4.8	N/A	60.5	875	835	6	2.5	6	3	N/A	Yellow
	O3	Guymon	N/A	4.5	N/A	60.1	850	810	6	3.0	6	4	N/A	Yellow
	O4	Shattuck	N/A	4.3	N/A	56.1	775	855	6	3.0	7	4	N/A	Yellow
	O5	Enid/Alva	N/A	4.3	N/A	59.1	775	925	8	3.2	7	4	N/A	Yellow
	O7	Catoosa	N/A	5.0	N/A	61.8	965	945	8	4.0	8	4	N/A	Yellow
	O8	Apache	N/A	5.5	N/A	59.3	835	875	6	2.5	7	3	N/A	Yellow
	South Dakota	S1	East Central	N/A	5.3	N/A	61.3	950	870	6	4.0	6	4	N/A
S2		West Central	N/A	4.5	N/A	57.8	850	920	7	4.0	6	4	N/A	Yellow
Texas	T1	Lubbock	N/A	4.8	N/A	58.5	850	795	6	2.5	6	3	N/A	Yellow
	T2	Abilene	N/A	6.3	N/A	57.9	775	835	5	3.2	6	3	N/A	Yellow
	T3	Fort Worth	N/A	4.5	N/A	58.4	815	810	4	2.5	5	4	N/A	Creamy
	T4	Hereford	N/A	3.3	N/A	57.7	935	850	5	3.0	6	3	N/A	Yellow
	T5	Amarillo	N/A	4.5	N/A	58.6	935	800	5	2.8	6	3	N/A	Yellow
	T6	Sunray	N/A	4.5	N/A	58.8	900	810	6	3.2	8	4	N/A	Yellow