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SUMMARY OF CLASSES

	Hard Red Winter		Hard Red Spring		Soft Red Winter		Soft White		Durum*	
	2004	5-Year Avg	2004	5-Year Avg	2004	5-Year Avg	2004	5-Year Avg	2004	5-Year Avg
Test Weight (lb/bu)	58.8	59.6	61.1	60.0	58.2	58.7	60.0	60.0	61.7	59.7
(kg/hl)	77.4	78.4	80.4	78.9	76.7	77.2	79.1	79.0	80.3	77.7
Grade	2 HRW	2 HRW	1 NS	1 NS	2 SRW	2 SRW	1 SW	1SW	1 HAD	2 HAD
Dockage (%)	0.7	0.7	1.0	1.2	0.7	0.6	0.7	0.6	1.2	1.5
Wheat Moisture (%)	11.6	11.6	12.5	11.9	13.5	13.0	9.3	9.2	12.5	11.5
Wheat Protein (%) **	12.7	12.2	13.8	14.5	10.3	10.2	10.3	10.2	13.4	14.2
Wheat Ash (%) **	1.56	1.55	1.56	1.66	1.59	1.56	1.37	1.39	1.50	1.64
1000 Kernel Weight (g)	27.8	28.6	32.0	29.5	31.3	32.4	36.0	34.2	40.2	36.1
Wheat Falling Number (sec)	382	397	339	363	357	341	320	347	356	301
Flour/Semolina Extraction (%)	69.1	70.3	68.7	68.9	69.4	69.9	67.9	66.7	64.3	63.7
Flour/Semolina Ash (%) **	0.48	0.49	0.43	0.45	0.45	0.44	0.37	0.36	0.64	0.69
Wet Gluten (%)	31.2	28.4	32.9	35.9	22.1	22.3	23.0	22.7	35.0	37.2
Farinograph:										
Peak Time (min)	6.6	5.8	10.1	11.6	1.6	1.7	1.5	1.5	n/a	n/a
Stability (min)	12.4	10.8	15.5	20.5	3.0	3.2	2.9	2.7	n/a	n/a
Absorption (%)	59.2	59.5	65.1	64.9	53.1	52.6	50.5	50.3	n/a	n/a
Alveograph W (10-4 joules)	320	290	471	385	90	88	102	113	96	n/a
Loaf Volume (cc)	844	839	1036	1062	723	750	n/a	n/a	n/a	n/a
Production (mmt)	23.3	22.5	14.4	12.4	10.4	10.7	7.2	7.0	2.5	2.4

* Great Plains durum only, extraction and ash values are for semolina.

** Protein - 12% moisture basis; ash - 14% moisture basis

Hard Red Winter Wheat

Midwestern Harvest Survey

Most of the U.S. hard red winter wheat is grown in the Great Plains (Colorado, Kansas, Montana, Nebraska, Oklahoma, South Dakota and Texas). Geography, plus planting, growing, and harvesting conditions, and planted varieties all have a large influence on harvested wheat quality.

Drought conditions continued during the fall and winter in part of the HRW growing region leading to some winterkill. Freeze damage in early spring impacted some kernel filling. Scattered showers in June followed by heavy rains in July slowed harvest and contributed to areas of sprout damage in northwest Kansas and southwest Nebraska. In general, reduced production acreage and yields in the central plains states resulted in overall HRW production being lower in Colorado, Kansas and Nebraska.

Test weight is lower than last year by 1.6 lb/bu (2.0 kg/hl) and the five year average by 0.8 lb/bu (1.0 kg/hl), with average kernel size and weight both lower than last year. As a result, flour milling yields dropped 1.5 percentage points as compared to last year, and 1.2 percentage points compared to the five-year average.

The overall wheat and flour protein levels were higher than last year resulting in higher wet gluten content, very similar farinograph absorption, and better loaf volume.

Survey Methods: Information on the 2004 HRW crop is based on testing by CII Laboratory Services of Kansas City, Missouri. A total of 993 samples were collected in 30crop production zones during harvest. Data on protein content, test weight, moisture, thousand-kernel weight, wheat ash, and falling number were composited into three protein ranges (below 11.5%, 11.5 - 12.5%, and above 12.5%) within each crop production zone for the remaining tests. After FGIS established the grade on the composites, single kernel characteristics were determined and laboratory milling was carried out using a Buhler experimental mill (Model MLU-202). Milled composites were tested for flour and dough quality factors and baking performance. Data were weighted by production based on the USDA "Small Grains Summary" of September 2004. These data are presented as composite (overall) averages and the projected averages that can be expected at Pacific Northwest and Gulf of Mexico ports. Testing conforms to the American Association of Cereal Chemists Approved Methods (2004).

Milling and Flour Use: Commercial flour millers indicate that there was a smooth transition from last year's crop to this year. They also report that milling quality is equal to, and just a little better than last year. Protein average is higher but exhibits more of a spread rather than being close to the average. Although there was some frost and sprout damage in certain areas, it did not cause any milling problems as it was fairly easily blended off. Millers have not had complaints from the baking industry. Flour quality appears to meet their customer needs. Baking quality is reported to be very normal. Bake absorption, and crumb grain and texture are equal to or better than last year. Loaf volume is also equal to or better than last year

Summary: Reports from the milling industry indicate that the 2004 HRW wheat crop has slightly improved milling quality over the 2003 crop with equal to or better baking performance. As with a year ago, a wide range of protein content is readily available this year to supply bakers of traditional and non-traditional products. Reported sprout damage in localized production areas did not adversely influence overall crop quality. Wheat falling number values averaged 382 seconds, compared with 397 for the five year average. Wheat and flour buyers alike should always set meaningful specifications concerning important quality requirements before contracting for purchases.

The 2004 harvest data was compiled by CII Laboratory Services of Kansas City, Missouri.

California Harvest Survey

California's wheat growing regions are defined by climate, value of alternative crops, and the distinct differences in variety selection. This system has led to an implied "identity preserved" program in California where most wheat is traded on a variety-known basis.

This year's growing and harvest conditions were excellent. Test weights remain high, averaging over 81.7 kg/hl, kernels were consistent in size, and baking quality was sound on all varieties. Differences in average farinograph properties from 2003 to 2004 can be attributed to environmental and varietal differences. Various levels of sprout damage were detected throughout the harvest. Fortunately, the California industry can easily direct the destination of its wheat production. This capability can assure buyers that they receive the quality expected.

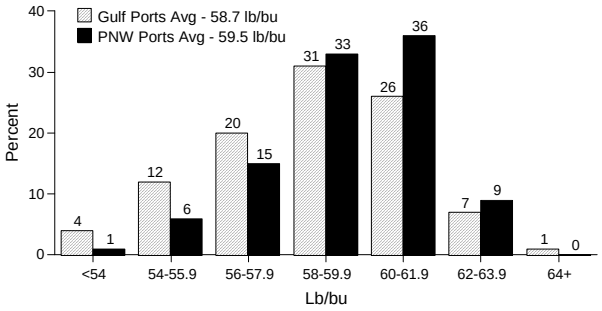
California wheat is predominately exported through the Port of Stockton, located on an inland waterway in Northern California. This grain handling facility is owned and operated by a California company. Wheat that goes into this facility is locally grown and trucked in, often times directly from the field.

California red wheats are harvested in June and July. With the strong demand for new crop wheat in the domestic market place, export buyers are encouraged to express their interest in purchasing California wheat in early spring.

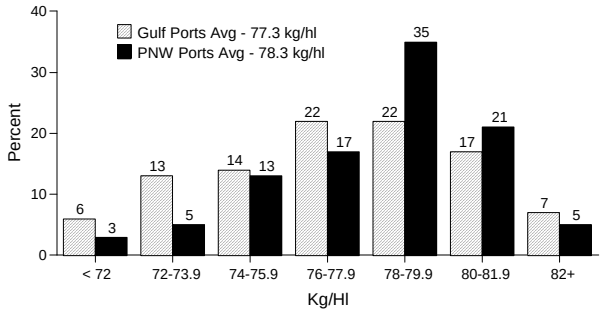
Export Cargo Survey

The export cargo data show the results of analysis of 497 individual sublot samples for marketing years 2004 and 2003. Of the 125 2004 samples collected in August and September, 92 are from Gulf ports and 33 from PNW ports. Of the 372 2003 samples, 309 were drawn at Gulf ports and 63 at PNW ports. Samples were randomly selected from official Federal Grain Inspection Service samples. Grade data are the actual official grades on the individual sublots. Milling and baking analyses were conducted by CII Laboratory Services.

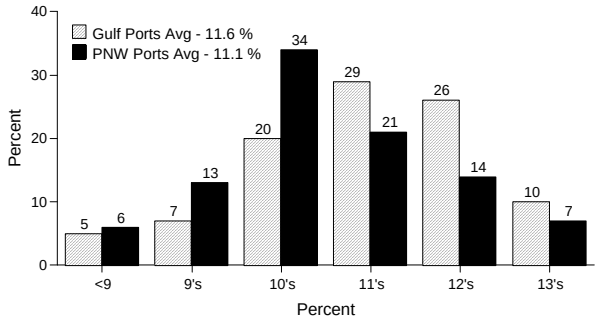
Test Weight



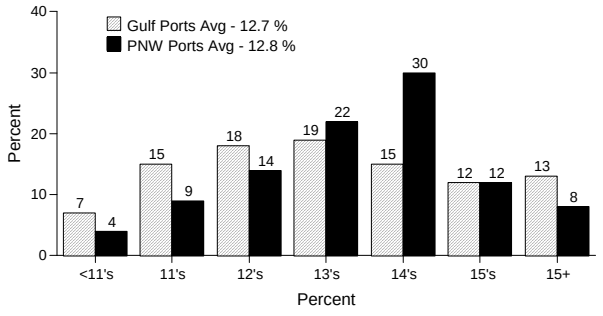
Hectoliter Weight



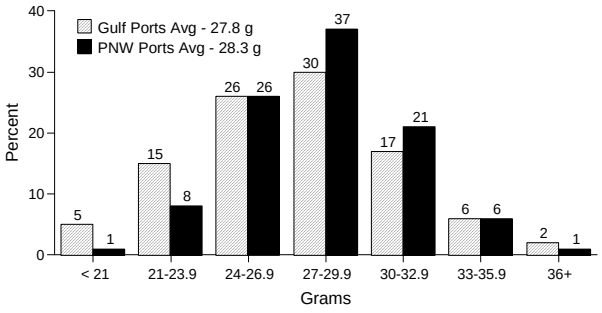
Wheat Moisture



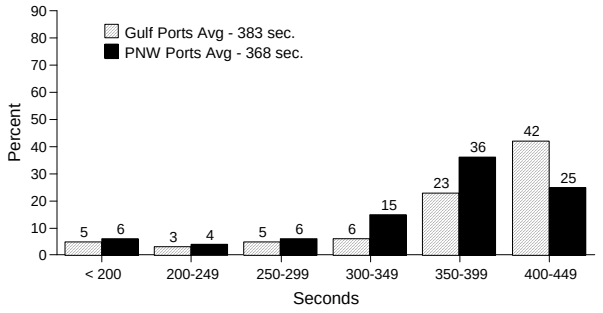
Protein (12% mb)



1000 Kernel Weight

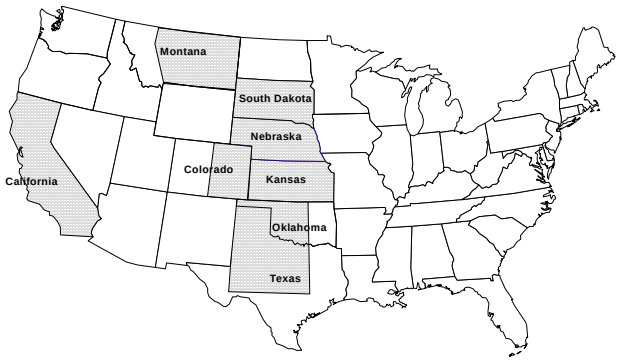


Falling Number



Note: Charts include Great Plains HRW only.

HRW Map



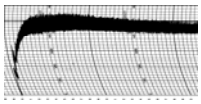
Hard red winter survey results are from eight states.

Midwestern

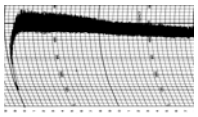
Composite Average Farinograms and Alveograms

Farinograms:

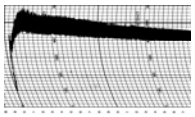
High Protein:



Medium Protein:

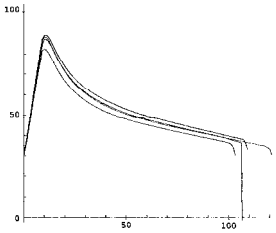


Low Protein:

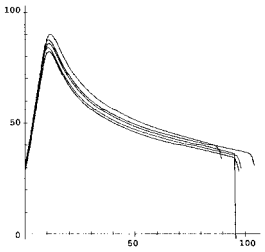


Alveograms:

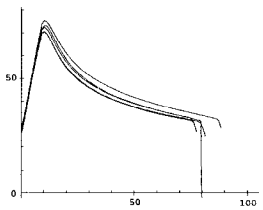
High Protein:



Medium Protein:



Low Protein:



Hard Red Winter	Composite Average					
	2004 By Protein*				2003	5-Year
	Low	Med	High	Overall	Overall	Avg
Wheat Grade Data:						
Test Weight (lb/bu)	59.8	59.4	58.1	58.8	60.4	59.6
(kg/hl)	78.6	78.1	76.5	77.4	79.4	78.4
Damaged Kernels (%)	0.5	0.4	1.4	1.0	0.4	0.3
Foreign Material (%)	0.1	0.1	0.1	0.1	0.1	0.1
Shrunken & Broken (%)	1.1	1.2	1.3	1.2	1.1	1.2
Total Defects (%)	1.7	1.7	2.7	2.2	1.6	1.7
Grade	2 HRW	2 HRW	2 HRW	2 HRW	1 HRW	2 HRW
Wheat Non-Grade Data:						
Dockage (%)	0.7	0.7	0.7	0.7	0.6	0.7
Moisture (%)	12.1	11.6	11.3	11.6	11.7	11.6
Protein (%) 12%/0% moisture basis	10.5/11.9	12.0/13.6	14.3/16.3	12.7/14.4	12.0/13.6	12.2/13.8
Ash (%) 14%/0% moisture basis	1.54/1.80	1.49/1.73	1.60/1.86	1.56/1.82	1.52/1.77	1.55/1.80
1000 Kernel Weight (g)	29.9	28.3	26.5	27.8	29.7	28.6
Kernel Size (%) lg/md/sm	69/30/01	56/43/01	49/49/02	57/42/01	59/40/01	53/45/02
Single Kernel: Hardness	61.6	66.8	70.6	64.5	73.7	73.7
Weight (mg)	30.7	29.2	28.0	29.0	30.1	29.4
Diameter (mm)	2.33	2.26	2.18	2.24	2.30	2.26
Sedimentation (cc)	28.4	38.6	57.4	46.2	39.2	40.0
Falling Number (sec)	398	397	366	382	409	397
Flour Data:						
Extraction Rate (%)	69.8	69.8	68.6	69.1	70.6	70.3
Color: L*	92.7	92.5	92.2	92.4	92.6	92.3
a*	-3.2	-3.2	-3.2	-3.2	-3.3	-3.3
b*	8.6	8.8	9.0	8.7	8.9	9.5
Protein (%) 14%/0% moisture basis	9.5/11.1	10.7/12.5	12.7/14.8	11.4/13.3	10.7/12.4	10.8/12.6
Ash (%) 14%/0% moisture basis	0.45/0.53	0.46/0.54	0.49/0.57	0.48/0.56	0.47/0.55	0.49/0.57
Wet Gluten (%)	24.4	28.3	34.9	31.2	28.6	28.4
Gluten Index	96.5	93.1	85.1	91.6		
Falling Number (sec)	378	394	366	379	425	415
Amylograph Viscosity 65 g (BU)	520	560	409	473	665	643
Starch Damage (%)	6.9	7.7	7.5	7.4	8.9	8.6
Dough Properties:						
Farinograph:						
Peak Time (min)	5.0	6.3	7.2	6.6	5.7	5.8
Stability (min)	10.5	12.7	13.5	12.4	10.2	10.8
Absorption (%)	56.6	58.5	60.6	59.2	59.8	59.5
Alveograph: P (mm)	81	89	90	87	101	94
L (mm)	90	103	126	112	89	90
W (10-4 joules)	252	306	363	320	302	290
Extensigraph: Resistance (BU)						
(45/135 min) Extension (cm)						
Area (sq cm)						
Baking Evaluation:						
Crumb Grain	6.8	7.0	6.9	7.0	6.4	6.9
Crumb Texture	6.9	7.2	7.7	7.4	7.2	7.3
Loaf Volume (cc)	747	804	854	844	809	839
% of Area Production:	30%	20%	50%	100%		

* Low: Less than 11.5%; Med: 11.5 - 12.5%; High: 12.5% or greater

Harvest Data

Gulf Exportable Average						PNW Exportable Average					
2004 By Protein*				2003	5-Year	2004 By Protein*				2003	5-Year
Low	Med	High	Overall	Overall	Avg	Low	Med	High	Overall	Overall	Avg
59.7	59.4	57.9	58.7	60.2	59.4	60.4	59.1	59.3	59.5	61.1	60.0
78.6	78.2	76.2	77.3	79.2	78.2	79.5	77.7	78.1	78.3	80.3	78.9
0.6	0.4	1.5	1.0	0.4	0.3	0.2	0.6	0.8	0.6	0.4	0.3
0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
1.0	1.2	1.3	1.2	1.0	1.2	2.6	1.4	1.3	1.6	1.3	1.4
1.7	1.7	2.8	2.3	1.6	1.6	1.7	2.1	2.1	2.0	1.7	1.7
2 HRW	2 HRW	3 HRW	2 HRW	1 HRW	2 HRW	1 HRW	2 HRW	2 HRW	2 HRW	1 HRW	2 HRW
0.7	0.7	0.7	0.7	0.6	0.6	0.8	0.6	1.0	0.9	0.8	0.8
12.1	11.7	11.3	11.6	12.0	11.8	11.5	11.1	11.0	11.1	10.6	11.1
10.5/11.9	12.0/13.6	14.4/16.3	12.7/14.4	11.8/13.4	12.1/13.7	10.4/11.8	12.1/13.7	13.9/15.8	12.8/14.5	12.4/14.1	12.6/14.3
1.55/1.80	1.49/1.74	1.61/1.87	1.57/1.82	1.52/1.77	1.55/1.80	1.47/1.71	1.46/1.70	1.56/1.81	1.52/1.77	1.52/1.77	1.53/1.78
29.9	28.2	26.2	27.8	29.7	28.5	29.9	28.4	27.8	28.3	29.8	28.7
69/30/01	56/43/01	48/50/02	57/42/01	60/39/01	53/45/02	61/38/01	55/44/01	50/48/02	55/44/01	53/46/01	48/50/02
61.0	66.5	70.5	63.9	74.0	74.1	69.4	71.5	71.5	70.3	72.8	73.8
30.7	29.1	27.9	29.0	30.2	29.3	31.0	30.1	28.8	29.1	29.8	29.3
2.34	2.26	2.19	2.25	2.31	2.25	2.27	2.25	2.16	2.19	2.25	2.22
27.8	38.3	57.6	45.6	39.6	39.8	35.3	41.2	56.1	50.5	37.6	41.8
401	401	366	383	404	393	364	372	368	368	425	410
69.9	69.9	68.5	69.1	70.5	70.2	69.0	69.3	69.1	69.1	71.0	70.6
92.7	92.5	92.1	92.4	92.6	92.1	92.5	92.3	92.4	92.5	92.6	92.6
-3.2	-3.2	-3.1	-3.2	-3.4	-3.3	-3.2	-3.3	-3.2	-3.2	-3.0	-3.3
8.6	8.8	8.9	8.7	8.9	9.4	8.9	8.8	9.0	8.9	9.1	9.4
9.5/11.0	10.7/12.4	12.8/14.9	11.4/13.3	10.7/12.4	10.8/12.5	9.8/11.4	11.0/12.8	12.4/14.5	11.5/13.3	11.0/12.8	11.2/13.0
0.45/0.53	0.46/0.54	0.50/0.58	0.48/0.56	0.47/0.55	0.49/0.57	0.44/0.51	0.46/0.54	0.45/0.53	0.45/0.53	0.46/0.53	0.48/0.55
24.3	28.2	35.0	31.0	28.4	28.1	25.4	29.9	34.4	32.5	29.2	29.4
96.7	93.8	85.5	92.0			94.7	86.0	82.6	88.6		
377	395	360	377	420	410	389	376	401	392	444	442
527	575	405	478	656	641	442	417	432	430	695	656
6.8	7.7	7.6	7.4	9.0	8.7	8.3	7.6	6.8	7.8	8.5	8.2
4.9	6.4	7.2	6.6	5.5	5.7	5.8	6.0	6.9	6.5	6.1	6.1
10.4	12.9	13.4	12.3	10.2	10.7	11.6	11.6	14.3	12.9	10.2	11.0
56.4	58.3	60.5	58.9	59.8	59.3	58.3	60.2	61.3	60.7	59.7	60.3
79	88	90	86	104	95	97	100	95	96	89	96
90	104	127	113	84	89	89	92	120	106	103	92
248	305	362	318	304	290	289	310	367	330	294	294
625/715	625/725	615/660	575/625	555/604	559/590	705/850	620/715	635/670	590/690	610/651	561/597
15.9/13.9	16.0/14.8	19.2/17.4	16.9/16.0	18.5/16.8	18.1/16.5	14.0/11.7	17.6/15.2	18.2/14.8	17.7/16.5	18.0/15.8	17.9/15.8
131/128	131/138	149/140	125/125	133/134	129/127	129/127	147/146	155/135	133/150	143/132	127/125
6.7	7.0	6.9	7.0	6.3	6.9	7.0	6.8	6.9	6.9	6.8	7.0
6.8	7.2	7.7	7.4	7.2	7.3	7.1	6.7	7.6	7.2	7.2	7.1
751	808	863	849	809	837	701	765	802	810	810	847
27%	17%	43%	88%			3%	2%	7%	12%		

California and Export Data

Hard Red Winter	California Harvest Data				Export Cargo Data			
	Medium Protein Average		High Protein Average		Gulf		PNW	
	2004	2003	2004	2003	2004	2003	2004	2003
Wheat Grade Data:								
Test Weight (lb/bu)	62.1	61.8	62.2	60.0	60.3	60.9	62.0	62.0
(kg/hl)	81.7	81.3	81.8	78.9	79.3	80.0	81.5	81.5
Damaged Kernels (%)	0.0	0.0	0.0	0.0	1.2	1.4	0.2	0.1
Foreign Material (%)	0.0	0.1	0.0	0.1	0.2	0.3	0.1	0.1
Shrunken & Broken (%)	0.5	0.6	0.6	0.7	1.4	1.6	1.1	1.5
Total Defects (%)	0.5	0.7	0.6	0.8	2.9	3.2	1.4	1.7
Grade	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	2 HRW	1 HRW	1 HRW
Wheat Non-Grade Data:								
Dockage (%)	0.6	0.6	0.8	0.7	0.6	0.6	0.2	0.3
Moisture (%)	9.4	9.2	9.4	9.2	12.0	11.5	11.5	9.6
Protein (%) 12%/0% moisture basis	11.8/13.3	11.8/13.4	13.0/14.7	13.4/15.2	12.3/14.0	11.8/13.4	12.2/13.9	12.4/14.1
Ash (%) 14%/0% moisture basis	1.38/1.60	1.47/1.71	1.49/1.73	1.55/1.80	1.54/1.79	1.51/1.75	1.48/1.72	1.45/1.69
1000 Kernel Weight (g)	38.2	39.3	38.8	38.6	26.4	26.7	29.1	27.3
Kernel Size (%) lg/md/sm					59/39/2	58/40/2	64/35/1	56/43/1
Single Kernel: Hardness					*	75.6	*	79.8
Weight (mg)					*	28.1	*	28.8
Diameter (mm)					*	2.31	*	2.34
Sedimentation (cc)					32.9	28.6	38.6	29.8
Falling Number (sec)					368	505	409	521
Flour Data:								
Extraction Rate (%)	68.6	69.4	69.8	69.2	70.6	71.5	71.6	71.9
Color: L*					92.6	92.1	92.7	92.0
a*					-3.4	-2.9	-3.4	-3.2
b*					8.4	8.5	8.4	9.0
Protein (%) 14%/0% moisture basis	10.3/12.0	10.1/11.7	11.6/13.5	11.4/13.2	10.8/12.6	10.5/12.2	11.0/12.7	11.1/12.9
Ash (%) 14%/0% moisture basis	0.42/0.49	0.46/0.53	0.40/0.47	0.47/0.55	0.47/0.55	0.48/0.56	0.46/0.54	0.48/0.56
Wet Gluten (%)	28.9	28.4	32.4	32.1	28.9	27.8	29.6	29.7
Gluten Index					92.7		90.5	
Falling Number (sec)	325	398	337	412	394	544	414	559
Amylograph Viscosity 65 g (BU)					416	734	499	688
Starch Damage (%)								
Dough Properties:								
Farinograph:								
Peak Time (min)	10.4	5.1	10.3	6.0	6.8	6.8	6.7	6.1
Stability (min)	25.8	9.1	17.6	10.6	12.2	12.7	11.5	10.3
Absorption (%)	61.8	64.4	60.8	64.8	59.1	59.4	61.1	61.5
Alveograph: P (mm)					98	107	110	108
L (mm)					92	88	88	87
W (10-4 joules)					311	310	332	307
Extensigraph: Resistance (BU)								
(45/135 min) Extension (cm)								
Area (sq cm)								
Baking Evaluation:								
Crumb Grain					6.8	6.7	6.6	6.6
Crumb Texture					7.0	7.2	7.2	7.1
Loaf Volume (cc)	833	812	875	896	779	802	777	812
Number of Samples					92	309	33	63

Hard Red Winter Production by Crop Year

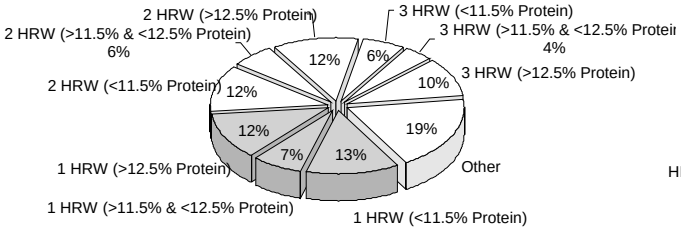
for the major HRW growing region
(million metric tons)

	2004	2003	2003	2002	2001
Kansas	8.13	12.41	7.29	8.84	9.37
Oklahoma	4.39	4.83	2.79	3.29	3.85
Texas	2.72	2.42	1.96	2.72	1.69
Colorado	1.16	1.99	0.99	1.80	1.85
Nebraska	1.63	2.23	1.37	1.61	1.62
Montana	1.76	1.78	0.58	0.51	1.20
South Dakota	1.53	1.67	0.55	0.32	1.46
California	0.67	0.63	0.59	0.69	0.71
Eight-State Total	**21.99**	**27.96**	**16.11**	**19.77**	**21.75**
Total HRW Production	**23.30**	**29.15**	**16.88**	**20.87**	**23.03**

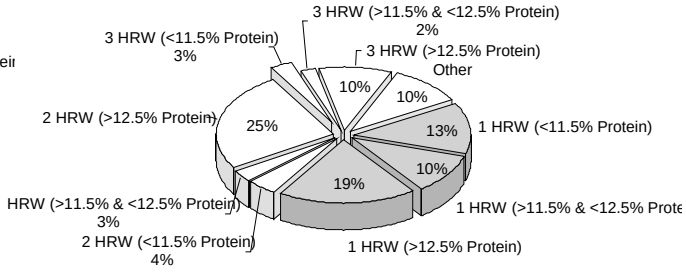
Based on USDA crop estimates of September 30, 2004.

Protein Distribution

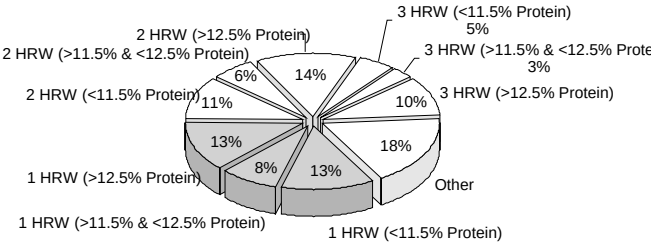
Gulf Exportable



PNW Exportable



Overall

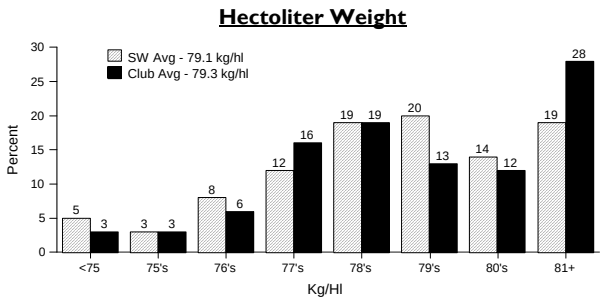


Pacific Northwest Soft White Wheat

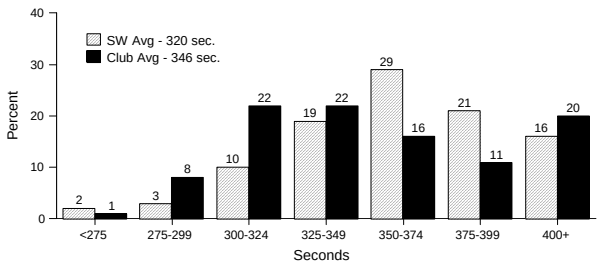
Harvest Survey

Weather and Harvest: The Pacific Northwest experienced dry conditions at planting. Timely rain came in winter to mid-spring that helped wheat growth in most dryland farming areas in Idaho, Oregon, and Washington. Dry conditions prevailed during most of the wheat harvest. Some localized rain fell in late summer that caused some limited sprout damage in isolated parts of the Pacific Northwest

Wheat and Grade Data: The average test weight was 60.0 lb/bu (79.1 kg/hl) for the 2004 soft white (SW) crop that was above last year and the same as the five-year average. Test weight for white club (WC) was the same as last year and the five-year average. Damaged kernels of



0.5% for SW and 0.1% for WC were higher than last year and the five-year average. Other grade data were similar to last year and the five-year average. SW and WC dockage contents were the same as last year, while that of SW was 0.1% lower than five-year average. Average moisture contents for SW and WC were 9.3 and 8.9%, respectively. SW wheat protein content of 10.3% was similar to last year and the five-year average. WC wheat protein content of 10.1% was higher than last year and the five-year average.



Wheat ash contents for both SW and WC were similar to last year and the five-year averages. SW and WC thousand kernel weights were heavier than last year, and slightly heavier than the five-year averages. SW and WC kernel diameters were larger than last year, bringing them similar to the five-year averages. SW falling number value was lowered by 42 from last year to 320 seconds. This was caused by localized rain fall in a few samples toward last part of harvest.

Flour, Dough and Bake Data The 2004 Buhler Laboratory Mill flour extractions for SW and WC were significantly higher than last year and slightly to moderately higher than the five-year averages with similar flour ash contents. Flour protein contents were 8.9 and 8.6% for SW and WC, respectively. Flour falling numbers and amylograph peak viscosity values showed sound flour samples. Starch damage values for SW and WC were slightly higher than last year and the five-year averages. Solvent Retention Capacity (SRC) data indicated SW and WC had slightly lower glutenin contents than last year. SW and WC farinograph water absorptions and mixing properties were similar to last year and the five-year averages. Alveograph showed that both SW and WC had less elasticity and similar or more extensibility than last year and the five-year averages. Extensigraph data showed a similar trends. SW and WC dough rheological tests indicated slightly weaker gluten properties than last year and the five-year averages. Sponge cake volumes for SW and WC were significantly increased from last year and the five-year averages with similar cake scores. Cookie spreads for SW and WC were slightly to moderately bigger than last year and the five-year averages.

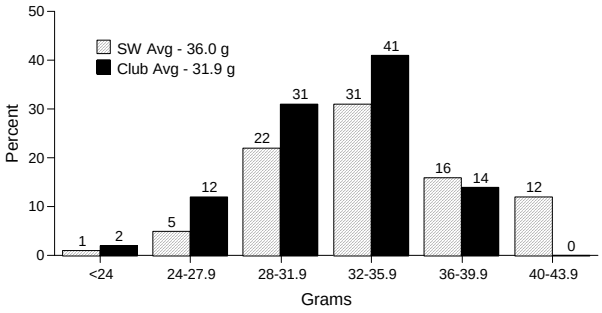
Chinese Southern-Type Steamed Bread: Each flour was made into southern-type steamed bread and compared with a Chinese commercial southern-type steamed bread control flour. Specific volumes were lower than last year and the five-year averages, but the total steamed bread scores were similar to the five-year averages.

Survey and Analysis Methods: Wheat quality testing and data analyses were conducted by the Wheat Marketing Center, Portland, Oregon. Laboratory testing was conducted according to American Association of Cereal Chemists Approved Methods (10th Edition). Survey samples were collected from producers under the management of the National Agricultural Statistics Services, USDA, and represent a statistical sampling of the crop. Federal Grain Inspection Service graded the wheat samples. The wheat commissions of Idaho, Oregon, and Washington, U.S. Wheat Associates, Inc., and the U.S. Department of Agriculture supported this program.

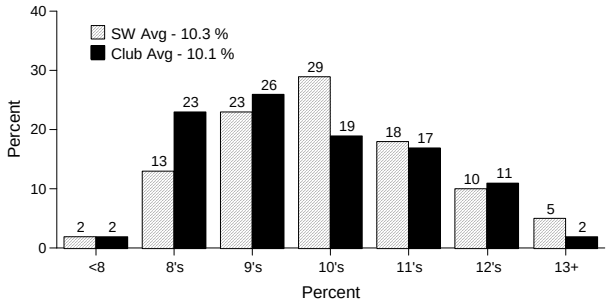
Export Cargo Survey

The Pacific Northwest white wheat export cargo data show the results of analyses of individual sublot samples including 89 drawn from the 2002 crop and 62 from the 2003 crop (October 2003 through May 2004). The samples were randomly selected from official Federal Grain Inspection Service samples. Grade data are the actual grades on the individual sublots. Milling and processing analyses were conducted by the Wheat Marketing Center, Portland, Oregon.

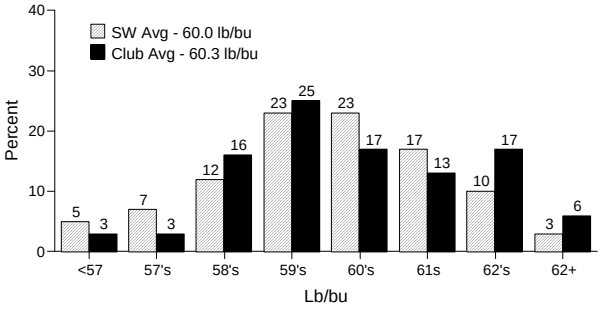
1000 Kernel Weight



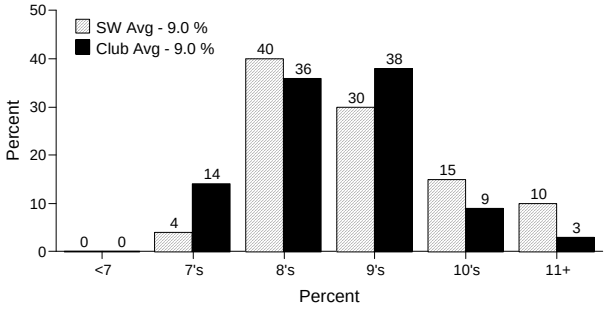
Protein (12% mb)



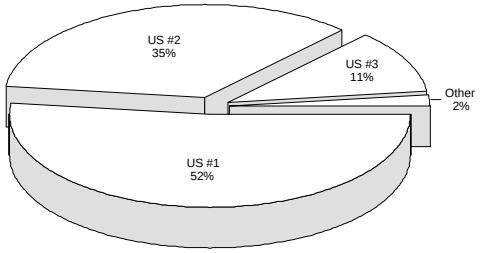
Test Weight



Wheat Moisture



2004 SW Grade Distribution



Pacific Northwest Soft White Wheat Production

by crop year in major white wheat producing states
(million metric tons)

	2004		2003		2002		2001		2000	
	SW	CLUB	SW	CLUB	SW	CLUB	SW	CLUB	SW	CLUB
Washington	3.10	0.24	3.00	0.31	2.86	0.28	2.91	0.30	3.52	0.41
Oregon	1.54	0.05	1.34	0.04	0.85	0.04	0.81	0.05	1.27	0.11
Idaho	1.53	0.06	1.58	0.04	1.57	0.04	1.49	0.05	2.03	0.08
Three-state Total	6.17	0.34	5.92	0.39	5.28	0.36	5.21	0.40	6.82	0.60
Three-state Total Soft White Wheat	6.51		6.31		5.64		5.61		7.42	
Total Soft White Wheat Production	7.23		6.99		6.42		6.31		8.25	

Based on USDA crop estimates of September 30, 2004.

Pacific Northwest Harvest Data

Soft White	2004					2003		5-Year Avg	
	Soft White By Protein*				Club				
	Low	Med	High	All	Avg	SW	Club	SW	Club
Wheat Grade Data:									
Test Weight (lb/bu)	59.9	60.0	60.0	60.0	60.3	59.4	60.3	60.0	60.3
(kg/hl)	78.8	79.0	79.1	79.1	79.3	78.2	79.3	79.0	79.4
Heat Damage (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Damaged Kernels (%)	0.8	0.7	0.1	0.5	0.1	0.0	0.0	0.1	0.0
Foreign Material (%)	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1
Shrunken & Broken (%)	0.8	0.7	0.8	0.8	1.2	1.0	1.5	0.9	1.4
Total Defects (%)	1.7	1.4	0.9	1.3	1.4	1.1	1.7	1.1	1.6
Grade	2 SW	1 SW	1 SW	1 SW	1 WC	2 SW	1 WC	1SW	1WC
Wheat Non-Grade Data:									
Dockage (%)	0.7	0.6	0.7	0.7	0.8	0.7	0.8	0.6	0.8
Moisture (%)	9.5	9.4	9.2	9.3	8.9	9.0	8.0	9.2	8.4
Protein (%) 12%/0% moisture basis	8.4/9.5	9.8/11.1	11.7/13.3	10.3/11.7	10.1/11.5	10.4/11.8	9.9/11.3	10.2/11.6	9.6/11.0
Ash (%) 14%/0% moisture basis	1.37/1.59	1.33/1.55	1.40/1.63	1.37/1.59	1.24/1.44	1.39/1.62	1.27/1.48	1.39/1.62	1.26/1.47
1000 Kernel Weight (g)	38.5	36.0	35.0	36.0	31.9	31.7	29.1	34.2	30.9
Kernel Size (%) lg/md/sm	87/13/0	87/13/0	83/17/0	87/13/0	79/21/0	75/24/1	66/33/1		
Single Kernel: Hardness	27.3	31.8	32.7	31.4	35.5	28.7	38.9	31.8	37.9
Weight (mg)	38.4	35.6	32.3	33.9	35.1	34.3	31.7	35.2	32.9
Diameter (mm)	2.59	2.49	2.44	2.49	2.29	2.40	2.23	2.48	2.29
Sedimentation (cc)	11.6	16.6	22.5	18.2	13.4	19.8	14.0	17.9	13.4
Falling Number (sec)	255	290	365	320	346	362	354	347	345
Flour Data:									
Extraction Rate (%)	69.3	68.4	67.2	67.9	68.9	65.0	67.4	66.7	68.6
Color: L*	92.6	92.6	92.4	92.4	92.4	92.6	92.9	92.5	92.6
a*	-2.8	-2.8	-2.7	-2.8	-2.6	-2.6	-2.5	-2.7	-2.5
b*	6.5	6.9	6.5	6.6	6.7	7.0	6.9	7.2	6.9
Protein (%) 14%/0% moisture basis	7.2/8.4	8.4/9.8	9.8/11.4	8.9/10.3	8.6/10.0	8.4/9.8	8.0/9.3	8.5/9.9	8.0/9.3
Ash (%) 14%/0% moisture basis	0.39/0.45	0.34/0.40	0.37/0.43	0.37/0.43	0.37/0.43	0.36/0.42	0.40/0.47	0.36/0.42	0.38/0.44
Wet Gluten (%)	17.6	20.9	27.9	23.0	18.0	24.1	18.4	22.7	16.7
Gluten Index	57.4	63.5	34.6	36.7	0.0				
Falling Number (sec)	358	370	344	361	353	328	324	345	341
Amylograph Viscosity 65 g (BU)	500	560	530	510	545	608	565	566	560
Starch Damage (%)	4.3	4.6	3.4	3.6	3.2	3.3	3.0	3.3	2.9
Solvent Retention Capacity (%)									
Water/50% Sucrose	54/101	55/105	53/106	54/103	45/95	53/112	45/105		
5% Lactic Acid/5% Sodium Carbonat	96/93	107/85	118/84	111/83	80/78	118/80	89/76		
Dough Properties:									
Farinograph:									
Peak Time (min)	1.0	1.3	1.7	1.5	1.0	1.6	1.5	1.5	1.2
Stability (min)	1.5	2.4	2.7	2.9	0.9	2.7	1.5	2.7	1.2
Absorption (%)	49.3	50.6	51.3	50.5	49.1	50.6	49.7	50.3	48.9
Alveograph: P (mm)	36	40	38	40	23	52	33	44	28
L (mm)	83	101	148	97	86	86	63	100	68
W (10-4 joules)	82	104	127	102	40	124	53	113	44
Extensigraph: Resistance (BU)	235	260	255	270	120	296	133	264	118
(45 min) Extension (cm)	13.5	16.3	16.9	16.1	14.8	14.1	13.9	15.3	13.9
Area (sq cm)	48	62	64	64	27	62	31	59	26
Baking Evaluation:									
Sponge Cake: Volume (cc)	1251	1207	1188	1265	1267	1139	1132	1163	1175
Score	53	49	43	52	49	53	47	52	50
Cookie Diameter (cm)	8.6	8.2	8.2	8.4	8.8	8.3	8.4	8.4	8.6
Chinese Southern-Type Steamed Bread Evaluation:									
Specific Volume (ml/g)	2.44	2.64	2.74	2.58	2.44	2.93	3.38	2.85	3.01
Total Score	68.3	69.3	67.5	68.8	63.5	68.4	65.3	68.3	64.1
% of Area Production:	17	41	42	100	100	100	100	100	100

Export Cargo Data

Soft White	2003	2002
Wheat Grade Data:		
Test Weight (lb/bu)	61.2	61.3
(kg/hl)	80.4	80.6
Heat Damage (%)	0.0	0.0
Damaged Kernels (%)	0.1	0.2
Foreign Material (%)	0.1	0.1
Shrunken & Broken (%)	1.2	1.2
Total Defects (%)	1.5	1.5
Grade	1 SW	1 SW
Wheat Non-Grade Data:		
Dockage (%)	0.3	0.4
Moisture (%)	9.0	9.4
Protein (%) 12%/0% moisture basis	10.1/11.4	10.1/11.5
Ash (%) 14%/0% moisture basis	1.32/1.54	1.35/1.57
1000 Kernel Weight (g)	34.3	35.4
Kernel Size (%) lg/md/sm	75/24/1	77/22/1
Single Kernel: Hardness	42.7	35.2
Weight (mg)	31.8	35.5
Diameter (mm)	2.37	2.43
Sedimentation (cc)	17.8	17.8
Falling Number (sec)	410	388
Flour Data:		
Extraction Rate (%)	69.9	70.3
Color: L*	92.4	92.4
a*	-2.6	-2.5
b*	7.0	6.9
Protein (%) 14%/0% moisture basis	8.3/9.6	8.4/9.8
Ash (%) 14%/0% moisture basis	0.41/0.48	0.41/0.48
Wet Gluten (%)	22.5	23.1
Gluten Index	48.4	
Falling Number (sec)	422	393
Amylograph Viscosity 65 g (BU)	578	537
Starch Damage (%)		
Solvent Retention Capacity (%)		
Water/50% Sucrose		
5% Lactic Acid/5% Sodium Carbonate		
Dough Properties:		
Farinograph:		
Peak Time (min)	1.3	1.6
Stability (min)	2.4	2.5
Absorption (%)	50.0	50.5
Alveograph: P (mm)	39	43
L (mm)	117	85
W (10-4 joules)	109	97
Extensigraph: Resistance (BU)		
(45 min) Extension (cm)		
Area (sq cm)		
Baking Evaluation:		
Sponge Cake: Volume (cc)	1136	1135
Score	44	46
Cookie Diameter (cm)	8.2	8.2
Chinese Southern-Type Steamed Bread Evaluation:		
Specific Volume (ml/g)		
Total Score		
Sample Count:	62	89

Composite Average Farinograms and Alveograms

Farinograms:

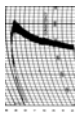
High Protein:

Medium Protein:

Low Protein:

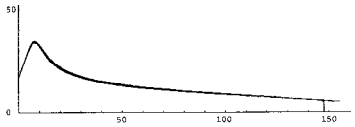
Average Protein:

Club:

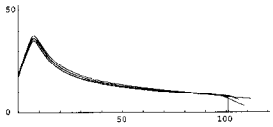


Alveograms:

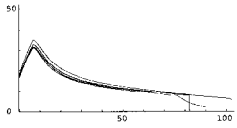
High Protein:



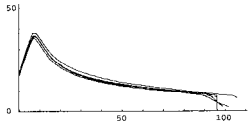
Medium Protein:



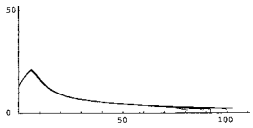
Low Protein:



Average Protein:



Club:



Hard Red Spring Wheat

Harvest Survey

Weather and Harvest: The 2004 hard red spring wheat (HRS) crop is about 6% larger than the 2003 crop, setting a new record for per acre yields and offsetting a slight reduction in planted area. A near normal planting season combined with good early season moisture and unusually cool summer temperatures were key factors in boosting the crop, despite lingering drought over a large area in the southwest part of the region. The cool summer significantly delayed crop maturity however, and cool, wet weather it made for a prolonged and late harvest period. Some isolated areas in the northern part of the region did incur some lower falling numbers and sporadic frost damage. Considering the extended harvest, crop quality is still quite good, but more varied than the outstanding 2003 crop with notably lower protein content.

Planting began in early April and was nearly complete in central and southern areas by mid-May, far ahead of the five-year average. At the end of May, rain and even snow across northern areas brought panting to a standstill, preventing some areas from being planted and pushing completion of planting into June.

Growing conditions in the early part of the season were beneficial for crop development as cool temperatures and above-average rainfall prevailed in most areas. The weather continued to be unusually cool for much of the growing season. The coolness eased crop stress in western areas where rainfall was well below normal and extended the grain fill period in the east leading to record yields. Disease pressures were generally minimal due to the cool temperatures even though crop maturity was seriously delayed which pushed back the commencement of harvest.

Harvest began in late July in southern locations, near normal, but quickly fell behind, as it progressed northward. Less than 25% of the crop was harvested by August 15 and only 50% was harvested by September 1, a full two weeks behind normal. High crop moisture, cool daytime temperatures and record yields continued to hamper the pace of harvest throughout September, with some areas not completed until mid-October.

Samples and Methods: Sample collection and analysis were conducted by the Hard Red Spring Wheat Quality Lab, Department of Plant Sciences, North Dakota State University, Fargo, North Dakota. The four-state HRS growing region from which samples were collected is depicted in the accompanying map. A total of 766 HRS samples were collected from growers and grain elevators at the time of harvest in Minnesota (100), Montana (160), North Dakota (379) and South Dakota (127). The collected samples represent approximately 90 percent of the harvest in the four-state region. Samples were segregated by wheat protein content and assigned and composited to protein levels within each export region as follows: less than 13.5%, 13.5-14.5% and greater than 14.5%. The methods are described in the Analysis Methods section of this booklet.

Wheat and Grade Data: The 2004 HRS crop grade averages No. 1 NS with 80% of the crop grading No. 1. This compares to No. 1 DNS in 2003, when 83% of the crop was No. 1 grade but average vitreous kernel counts were near 84% versus 74% this year. Test weights are slightly higher than a year ago and well above the five-year average with a marked improvement in the PNW tributary region. Thousand kernel weights are significantly higher than last year and the five-year average. Damage levels are similar to last year at 0.3% and well below the five-year average, as disease pressures were again minimal. Average protein content is 13.8%, down about one-half point from last year and the five-year average. Nearly 20% of the crop is less than 13% protein. The prolonged, wet harvest period did lower the average falling number on the crop to 339 seconds, well below last year's 411 seconds and also lower than the five-year average.

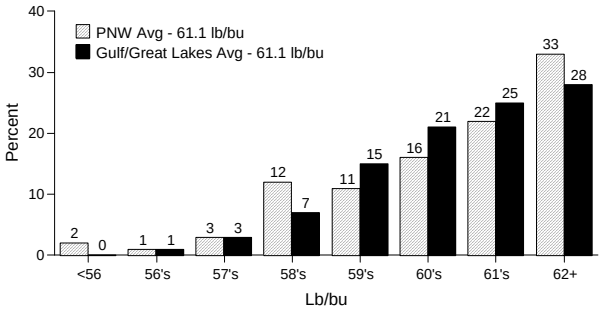
Flour and Baking Data: The average flour milling extraction is nearly the same as last year and the five-year average with lower flour ash values. Wet gluten averages 32.9%, down from 36.2 last year and a five-year average of 32.9. Average dough mixing properties, as measured by the farinograph, are showing shorter peak times and stabilities, especially compared to last year, but also somewhat lower than the five-year average. The average farinogram classification is a 5.7 (on a scale of 1 to 8), as compared to 7.3 last year. The most dramatic decline in dough strength is evident in the low and medium protein composites in all areas, and in the Gulf/Great Lakes tributary region as compared to the PNW region. Absorption is one and a half percentage points lower than last year for the region as a whole but slightly higher than the five-year average. Alveograph values are showing higher P and W values as compared to last year and the five-year average. Loaf volumes on average are lower than last year and the five-year average with slightly poorer bake scores.

Summary: The 2004 HRS crop exhibits a high grade profile, with especially high average test weights and thousand kernel weights. Disease pressures were again minimal and the level of damaged kernels is very low, similar to last year. Fusarium headblight (scab) was virtually non-existent with exception of some isolated areas. A wet harvest period did reduce average vitreous kernel counts and average falling number values, as compared to 2003 with lower falling number values more prevalent in the northern production areas where harvest was later. The cool summer and high yields significantly lowered average protein content in the crop, although western parts of the region are showing somewhat higher protein averages. In addition there is slightly more of the crop in the 13 to 15% protein range, just significantly less in the 15 and higher range.

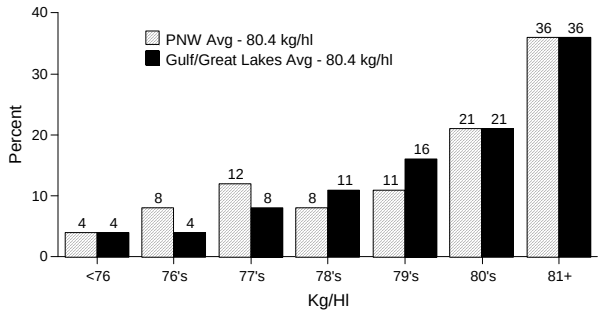
The crop has average flour milling extraction but is weaker in dough mixing strength than is traditionally found in U.S. hard red spring wheat. Dough strength does improve with protein content from east to west across the region. Baking quality is showing lower average loaf volumes.

As is the case with most years, quality differences do exist across the region. This year, falling number values and mixing stability seem to show the greatest variance across the region. Buyers are encouraged to seek out regional specific information where available and use the contract specifications that best meet their quality and value needs in sourcing their 2004 needs. (continued on page 29)

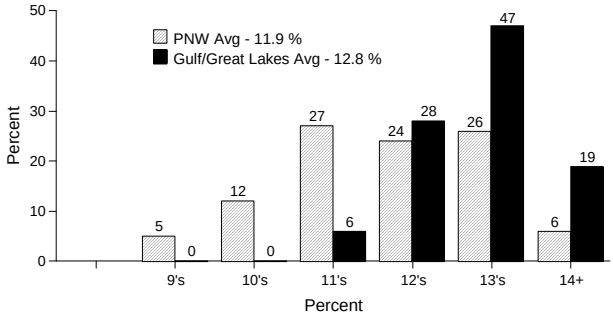
Test Weight



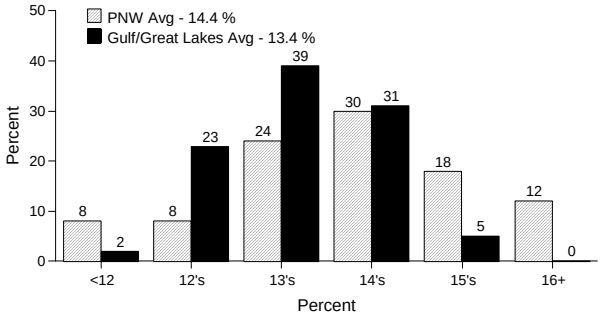
Hectoliter Weight



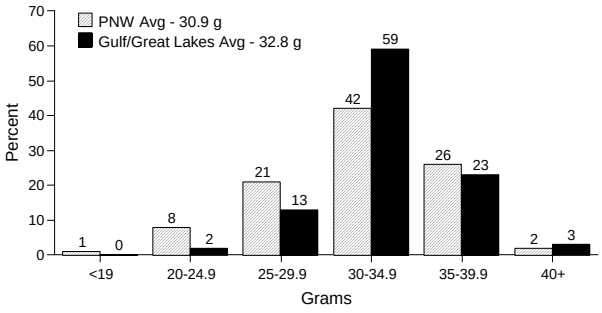
Wheat Moisture



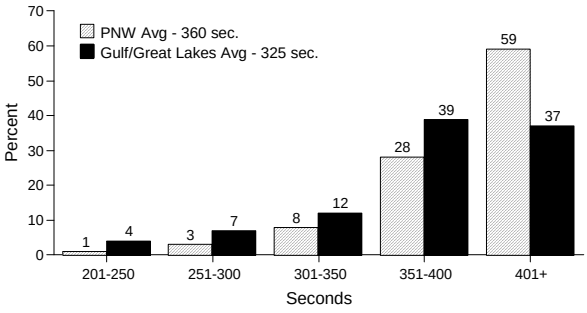
Protein (12% mb)

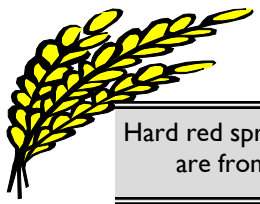


1000 Kernel Weight



Falling Number



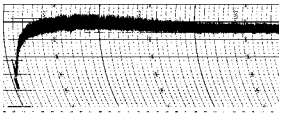


Hard red spring survey results are from four states.

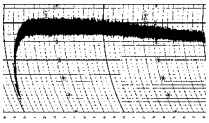
Composite Average Farinograms and Alveograms

Farinograms:

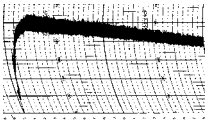
High Protein:



Medium Protein:

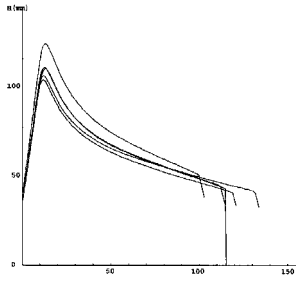


Low Protein:

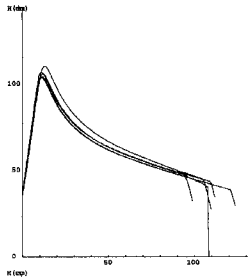


Alveograms:

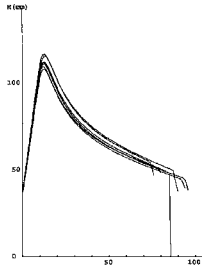
High Protein:



Medium Protein:



Low Protein:



Hard Red Spring	Composite Average					
	2004 By Protein*				2003	5-year
	Low	Med	High	Overall	Overall	Avg
Wheat Grade Data:						
Test Weight (lb/bu)	61.5	61.2	60.5	61.1	60.9	60.0
(kg/hl)	80.9	80.5	79.6	80.4	80.1	78.9
Damaged Kernels (%)	0.3	0.4	0.1	0.3	0.3	0.5
Foreign Material (%)	0.0	0.0	0.0	0.0	0.0	0.0
Shrunken & Broken (%)	0.6	0.8	1.2	0.8	1.2	1.4
Total Defects (%)	1.0	1.2	1.3	1.1	1.6	1.9
Vitreous Kernels (%)	63.8	69.7	89.8	73.5	83.7	72.0
Grade	1 NS	1 NS	1 DNS	1 NS	1 DNS	1 NS
Wheat Non-Grade Data:						
Dockage (%)	1.1	0.9	0.9	1.0	1.0	1.2
Moisture (%)	12.7	12.7	11.9	12.5	11.5	11.9
Protein (%) 12%/0% moisture basis	12.5/14.2	13.7/15.6	15.5/17.6	13.8/15.7	14.2/16.2	14.5/16.5
Ash (%) 14%/0% moisture basis	1.54/1.80	1.54/1.80	1.59/1.86	1.56/1.81	1.62/1.88	1.66/1.93
1000 Kernel Weight (g)	33.3	32.9	29.4	32.0	29.6	29.5
Kernel Size (%) lg/md/sm	74/23/3	70/27/3	51/42/7	66/30/4	49/42/9	53/39/8
Single Kernel: Hardness	79.6	81.8	79.9	80.5	88.4	82.1
Weight (mg)	35.0	34.4	32.9	34.2	30.6	30.4
Diameter (mm)	2.44	2.41	2.30	2.39	2.24	2.31
Sedimentation (cc)	55.6	63.8	66.6	61.8	54.7	54.3
Falling Number (sec)	352	313	356	339	411	363
Flour Data:						
Extraction Rate (%)	69.1	69.2	67.6	68.7	68.9	68.9
Color: L*	91.6	91.6	91.5	91.6	91.8	90.5
a*	-1.5	-1.3	-1.2	-1.3	-1.0	-1.4
b*	9.4	9.1	9.0	9.2	9.4	9.4
Protein (%) 14%/0% moisture basis	11.1/13.0	12.5/14.5	14.6116.4	12.5/14.5	13.0/15.1	13.3/15.4
Ash (%) 14%/0% moisture basis	0.43/0.49	0.43/0.50	0.43/0.50	0.43/0.50	0.45/0.53	0.45/0.53
Wet Gluten (%)	28.1	33.7	37.6	32.9	36.2	35.9
Gluten Index	97.8	91.7	91.2	93.6		
Falling Number (sec)	360	348	398	366	440	393
Amylograph Viscosity: 65g (BU)	457	477	767	554	843	599
100g (BU)	1406	1540	2364	1734	2896	2149
Starch Damage (%)	7.2	7.8	8.0	7.6	6.6	
Dough Properties:						
Farinograph:						
Peak Time (min)	3.0	7.2	22.1	10.1	15.0	11.6
Stability (min)	7.8	12.6	28.3	15.5	26.4	20.5
Absorption (%)	64.6	65.5	65.3	65.1	66.6	64.9
Classification	4.0	6.0	7.3	5.7	7.3	6.6
Alveograph: P (mm)	138	127	126	131	102	96
L (mm)	79	108	107	98	109	113
W (10-4 joules)	421	493	501	471	395	385
Extensigraph: Resistance (BU)**	584/699	548/589	551/639	561/641	535/625	512
(45/135 min) Extension (cm)	17.5/17.1	21.1/19.7	22.5/22.3	20.3/19.6	21.8/21.4	23.2
Area (sq cm)	129/145	146/146	151/180	142/516	145/167	148
Baking Evaluation:						
Absorption (%)	63.1	64.0	63.8	63.6	65.1	63.4
Crumb Grain and Texture	8.0	8.0	7.3	7.8	8.3	8.2
Loaf Volume (cc)	940	1086	1086	1036	1081	1062
% Area Production:	34	37	29	100	100	100

* Low: Less than 13.5%; Med: 13.5 - 14.5%; High: 14.5% or greater.

Data

PNW Average						Gulf/Great Lakes Average					
2004 By Protein*				2003	5-year Avg	2004 By Protein*				2003	5-year Avg
Low	Med	High	Overall			Low	Med	High	Overall		
62.4	61.4	60.2	61.1	59.6	60.1	61.2	61.1	61.0	61.1	62.0	59.8
82.0	80.7	79.2	80.4	78.4	79.1	80.5	80.4	80.2	80.4	81.5	78.7
0.1	0.2	0.0	0.1	0.1	0.3	0.4	0.5	0.2	0.4	0.5	0.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
1.0	0.9	1.3	1.1	2.0	1.8	0.5	0.7	1.0	0.7	0.7	1.1
1.1	1.1	1.3	1.2	2.1	2.1	0.9	1.2	1.3	1.1	1.2	1.8
83.0	87.0	93.0	88.6	95.5	85.0	57.0	63.0	84.0	63.4	73.6	62.0
1 DNS	1 DNS	1 DNS	1 DNS	1 DNS	1 DNS	1NS	1NS	1DNS	1NS	1 NS	1 NS
1.0	0.9	0.8	0.9	0.8	1.2	1.1	0.9	1.2	1.0	1.2	1.2
12.3	12.3	11.4	11.9	10.2	11.0	12.9	12.8	12.7	12.8	12.5	12.5
12.4/14.1	14.1/16.0	15.7/17.8	14.4/16.3	14.9/17.0	14.8/16.8	12.5/14.2	13.6/15.5	15.2/17.3	13.4/15.2	13.5/15.4	14.2/16.2
1.46/1.70	1.48/1.72	1.57/1.83	1.51/1.76	1.60/1.86	1.62/1.88	1.57/1.83	1.57/1.83	1.63/1.90	1.57/1.84	1.63/1.89	1.70/1.97
33.4	32.8	28.2	30.9	27.0	29.3	33.2	33.0	31.4	32.9	31.9	29.7
70/27/3	64/32/3	44/47/9	57/37/6	31/56/13	48/43/9	75/22/3	72/25/3	64/32/4	72/25/3	65/30/5	57/35/7
87.0	84.0	81.0	83.5	86.2	82.1	77.0	81.0	78.0	78.9	90.3	82.0
35.9	34.0	32.2	33.7	28.9	30.0	34.7	34.5	34.1	34.5	32.0	30.4
2.43	2.36	2.25	2.33	2.11	2.30	2.44	2.43	2.39	2.43	2.35	2.33
60.0	66.0	67.0	64.9	54.8	56.0	54.0	63.0	66.0	59.6	54.1	51.3
374	329	372	360	425	376	344	307	327	325	400	349
67.9	68.2	67.2	67.7	67.1	68.2	69.5	69.6	68.2	69.4	70.4	69.5
91.9	91.9	91.6	91.7	91.6	90.5	91.5	91.6	91.5	91.5	91.9	90.4
-1.4	-1.3	-1.2	-1.3	-0.9	-1.3	-1.5	-1.3	-1.3	-1.4	-1.1	-1.4
8.8	8.9	8.9	8.9	9.3	9.1	9.6	9.2	9.2	9.4	9.5	9.7
11.0/12.8	12.6/14.7	14.4/16.7	13.0/15.1	13.8/16.0	13.7/15.9	11.2/13.0	12.4/14.4	13.7/15.9	12.1/14.0	12.3/14.3	12.9/15.0
0.39/0.45	0.42/0.49	0.42/0.49	0.41/0.48	0.47/0.54	0.45/0.52	0.44/0.51	0.43/0.50	0.44/0.51	0.44/0.51	0.44/0.51	0.45/0.53
26.8	33.6	38.0	33.8	38.5	37.0	28.5	33.8	37.0	32.0	33.9	35.0
97.8	98.4	94.4	96.5			97.8	89.1	85.6	92.3		
377	339	421	385	467	408	354	351	356	353	417	379
675	430	900	701	960	669	380	495	530	452	749	527
2220	1130	2800	2148	3320	2474	1120	1700	1590	1441	2553	1841
7.6	8.2	8.2	8.0	6.5		7.0	7.7	7.6	7.4	6.6	
3.0	9.0	29.5	16.5	20.6	14.9	3.0	6.5	9.0	5.4	10.3	8.7
8.5	13.0	38.0	22.8	33.5	25.8	7.5	12.5	11.0	10.2	20.7	16.1
65.0	65.4	64.5	64.9	67.3	66.0	64.5	65.5	66.6	65.2	65.9	63.9
4.0	6.0	8.0	6.4	8.0	7.3	4.0	6.0	6.0	5.2	6.7	6.1
142	130	127	132	111	106	137	126	124	130	95	89
76	109	110	101	100	105	80	108	103	96	116	119
423	508	526	494	411	401	420	487	456	455	380	371
595/780	555/625	600/7400	585/716	577/689	528	580/670	545/575	465/460	548/599	501/574	500
17.7/16.6	21.9/19.1	21.9/21.2	20.8/19.4	21.6/20.8	23.7	17.5/17.3	20.8/19.9	23.7/24.2	19.8/19.4	21.9/21.8	22.8
131/155	155/150	160/204	151/175	155/178	156	129/141	142/145	135/138	135/142	136/157	141
63.5	63.9	63.0	63.4	65.8	64.5	63.0	64.0	65.1	63.7	64.4	62.4
8.0	8.0	7.5	7.8	8.3	8.3	8.0	8.0	7.0	7.9	8.3	8.1
910	1025	1050	1006	1096	1075	950	1110	1150	1048	1062	1051
26	30	44	100	100	100	42	44	14	100	100	100

Export Cargo Data

Hard Red Spring	PNW Average		Great Lakes Average		Gulf Average	
	2003	2002	2003	2002	2003	2002
Wheat Grade Data:						
Test Weight (lb/bu)	61.2	61.0	62.3	60.6	62.1	60.2
(kg/hl)	80.5	80.2	81.9	79.7	81.6	79.2
Damaged Kernels (%)	0.2	0.5	1.6	1.3	1.1	1.4
Foreign Material (%)	0.1	0.1	0.1	0.1	0.2	0.2
Shrunken & Broken (%)	1.7	1.6	1.1	1.3	1.1	1.5
Total Defects (%)	2.1	2.1	2.8	2.8	2.4	3.1
Vitreous Kernels (%)	84.5	76.8	62.2	52.4	65.8	59.0
Grade	1 DNS	1 DNS	1 NS	1 NS	1 NS	2 NS
Wheat Non-Grade Data:						
Dockage (%)	0.3	0.4	0.5	0.5	0.5	0.7
Moisture (%)	10.5	11.3	12.1	12.8	12.2	12.8
Protein (%) 12%/0% moisture basis	14.3/16.3	14.3/16.2	13.7/15.6	14.4/16.4	13.9/15.8	14.5/16.5
Ash (%) 14%/0% moisture basis	1.56/1.81	1.57/1.83	1.57/1.83	1.67/1.95	1.58/1.84	1.68/1.95
1000 Kernel Weight (g)	31.7	33.0	33.7	30.7	33.2	30.7
Kernel Size (%) lg/md/sm	47/45/8	54/38/8	65/30/5	52/39/9	62/32/5	50/41/9
Single Kernel: Hardness	84.3	76.7	85.9	80.0	83.5	77.6
Weight (mg)	27.5	31.6	29.0	28.6	29.0	28.5
Diameter (mm)	2.33	2.42	2.41	2.33	2.40	2.30
Sedimentation (cc)						
Falling Number (sec)	439	412	340	325	394	346
Flour Data:						
Extraction Rate (%)	69.2	69.8	70.4	70.2	70.6	69.9
Color: L*	91.1	89.9	90.8	89.6	90.9	89.7
a*	-1.2	-1.2	-1.3	-1.3	-1.3	-1.3
b*	9.1	8.7	9.8	9.5	9.7	9.2
Protein (%) 14%/0% moisture basis	13.2/15.3	13.2/15.4	12.5/14.5	13.2/15.4	12.7/14.8	13.3/15.4
Ash (%) 14%/0% moisture basis	0.50/0.58	0.45/0.53	0.49/0.57	0.45/0.53	0.49/0.57	0.46/0.54
Wet Gluten (%)	34.7	36.0	32.9	35.3	33.4	35.3
Gluten Index	92.4		96.3		92.9	
Falling Number (sec)	466	463	359	362	413	389
Amylograph Viscosity: 65g (BU)	726	671	386	418	586	462
100g (BU)						
Starch Damage (%)						
Dough Properties:						
Farinograph:						
Peak Time (min)	11.1	12.2	7.3	9.3	8.4	9.7
Stability (min)	19.7	24.5	13.6	17.2	15.5	18.3
Absorption (%)	67.2	66.5	65.8	64.7	65.5	64.4
Classification	6.8	7.3	5.7	6.5	6.1	6.8
Alveograph: P (mm)	124	112	112	98	109	98
L (mm)	98	104	107	115	106	111
W (10-4 joules)	441	407	423	388	407	385
Extensigraph: Resistance (BU)**						
(45/135 min) Extension (cm)						
Area (sq cm)						
Baking Evaluation:						
Absorption (%)	65.8	64.9	64.3	63.2	64.0	62.9
Crumb Grain and Texture	8.1	8.3	8.2	8.4	8.2	8.3
Loaf Volume (cc)	998	1012	1018	1047	998	1039
Sample Count:	101	147	36	58	34	45

Hard Red Spring Production by Crop Year

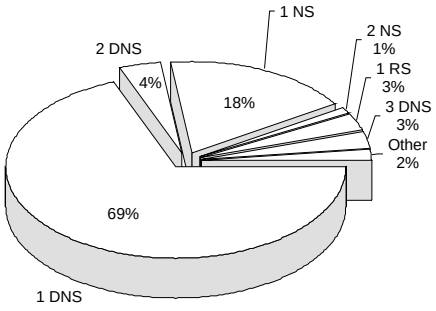
for the major producing states
(million metric tons)

	2004	2003	2002	2001	2000
Minnesota	2.44	2.84	1.67	2.16	2.60
Montana	2.42	1.63	2.05	1.77	2.09
North Dakota	6.70	6.88	4.50	6.38	6.36
South Dakota	1.96	1.53	0.65	1.75	1.63
Four-State Total	**13.51**	**12.88**	**8.86**	**12.06**	**12.68**
Total HRS Production	**14.43**	**13.60**	**9.57**	**12.94**	**13.67**

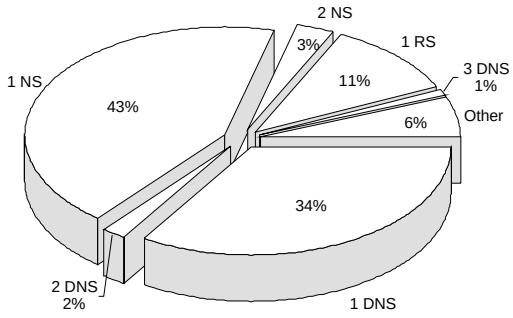
Based on USDA crop estimates of September 30, 2004.

Grade Distribution

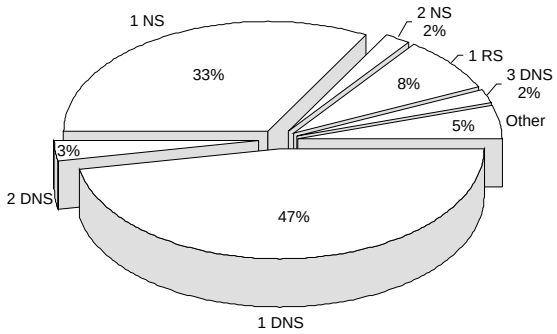
PNW



Gulf/Great Lakes



Overall



Soft Red Winter Wheat

Harvest Survey

Weather and Harvest. Soft red winter wheat (SRW) is grown over a wide area of the eastern United States with diverse weather patterns which result in variations in SRW quality. During the 2003/04 growing season, weather was mostly favorable for wheat growth, and production is estimated to similar to that of 2003. Conditions at harvest varied from state to state and also from early to late harvest times. Rainfall extended from May through mid-June in most areas and caused delays in ripening and harvest, higher than desired moisture levels, and fusarium damage (with the resulting mycotoxin DON) in some fields.

Survey Methods. Sample collection and analysis was conducted by CII Laboratory Services, Kansas City, Missouri. For 2004, 353 samples were collected in nine key production states: Arkansas, Illinois, Indiana, Maryland, Missouri, Ohio, North Carolina, Virginia and Kentucky. These states are divided into 18 reporting areas, and samples were collected in each state at two different times reflecting early and late harvest conditions, for a total of 36 sets of results. Test weight, moisture, protein, thousand kernel weight and Falling Number were determined on the individual samples, while the remaining tests were determined on 36 composite samples. The results were weighted by five-year average production for the 18 reporting areas and combined into the "Composite Average" "East Coast" and "Gulf Ports" values shown in this report. States tributary to the East Coast include Maryland, North Carolina and Virginia, while the other states are considered Gulf tributary

Wheat and Grade Data. For Composite Average and Gulf Ports, both test weight and thousand kernel weights are lower than last year and the five-year averages. East Coast results for these factors affecting milling yield were higher than last year's unusually low values but still below the five-year averages. Wheat moisture content was 0.5 percentage points above last year and the five-year average, which reflects the wet harvest conditions in many areas. Composite Average and Gulf Port protein are both higher than last year by 0.4 percentage points and very similar to the five-year average. The East Coast wheat protein result, however, is lower than last year and the five-year average. While there was considerable concern about Falling Number values because of the rain during harvest, survey results indicate slightly higher Falling Numbers than last year or the five-year average. While this survey does not determine DON values, there were widespread reports of higher DON levels detected in SRW this year.

(continued on p. 21)

Winter Wheat Production

in major soft red winter wheat producing states
(million metric tons)

	2004	2003	2002	2001	2000
Alabama	0.08	0.09	0.07	0.09	0.13
Arkansas	0.89	0.78	1.04	1.37	1.62
Georgia	0.23	0.29	0.22	0.29	0.29
Illinois	1.43	1.40	0.82	1.17	1.40
Indiana	0.74	0.81	0.45	0.68	0.96
Kentucky	0.54	0.57	0.45	0.62	0.63
Louisiana	0.22	0.15	0.23	0.21	0.26
Maryland	0.23	0.15	0.31	0.30	0.34
Michigan	0.59	0.65	0.43	0.55	0.50
Mississippi	0.19	0.17	0.20	0.32	0.35
Missouri	1.25	1.39	0.88	1.08	1.30
North Carolina	0.63	0.40	0.49	0.50	0.75
Ohio	1.50	1.85	1.37	1.64	2.18
South Carolina	0.22	0.20	0.17	0.25	0.26
Tennessee	0.37	0.37	0.38	0.50	0.57
Virginia	0.27	0.20	0.28	0.28	0.35
16-State Total	**9.39**	**9.44**	**7.78**	**9.85**	**11.89**
Total SRW Production	**10.35**	**10.35**	**8.74**	**10.88**	**12.83**

Data are based on USDA crop estimates of September 30, 2004.

Harvest Data

Soft Red Winter	Composite Average			East Coast*			Gulf Ports*		
	2004	2003	5-Year Avg	2004	2003	5-Year Avg	2004	2003	5-Year Avg
Wheat Grade Data:									
Test Weight (lb/bu)	58.2	58.9	58.7	58.1	56.7	58.8	58.3	59.1	58.8
(kg/hl)	76.7	77.5	77.2	76.5	74.6	77.4	76.7	77.8	77.4
Damaged Kernels (%)	1.8	2.6	1.2	1.2	4.0	1.4	1.9	2.4	1.2
Foreign Material (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
Shrunken & Broken (%)	0.7	0.6	0.6	0.8	1.1	0.7	0.7	0.6	0.6
Total Defects (%)	2.5	3.3	1.9	2.1	5.2	2.2	2.6	3.1	1.8
Grade	2 SRW	2 SRW	2 SRW	2 SRW	3 SRW	2 SRW	2 SRW	2 SRW	2 SRW
Wheat Non-Grade Data:									
Dockage (%)	0.7	0.8	0.6	0.9	1.5	0.9	0.7	0.7	0.6
Moisture (%)	13.5	13.0	13.0	13.7	13.5	13.1	13.5	12.9	13.0
Protein (%) 12%/0% moisture basis	10.3/11.7	9.9/11.3	10.2/11.6	10.6/12.1	11.0/12.5	10.9/12.4	10.2/11.6	9.8/11.1	10.1/11.5
Ash (%) 14%/0% moisture basis	1.59/1.85	1.60/1.86	1.56/1.82	1.61/1.87	1.63/1.90	1.53/1.78	1.58/1.84	1.60/1.86	1.57/1.82
1000 Kernel Weight (g)	31.3	33.0	32.4	31.1	28.8	31.7	31.3	33.4	32.4
Kernel Size (%) lg/md/sm	81/18/01	82/17/01	82/17/01	80/19/01	72/27/01	78/21/01	81/18/01	83/16/01	83/17/01
Single Kernel: Hardness	17.3	22.4	23.2	15.4	21.9	25.3	17.7	22.4	23.3
Weight (mg)	31.9	32.4	32.6	31.9	29.8	32.1	31.9	32.7	32.6
Diameter (mm)	2.28	2.31	2.31	2.26	2.16	2.26	2.29	2.32	2.33
Sedimentation (cc)	12.9	13.3	14.3	14.4	18.3	18.1	12.6	12.8	13.5
Falling Number (sec)	357	339	341	354	349	343	358	338	343
Flour Data:									
Extraction Rate (%)	69.4	68.2	69.9	70.1	68.1	69.5	69.3	68.3	70.0
Color: L*	92.8	93.2	93.4	92.9	92.9	93.3	92.8	93.2	93.4
a*	-3.2	-3.2	-3.4	-3.3	-3.4	-3.5	-3.2	-3.2	-3.4
b*	8.0	7.6	8.1	8.0	7.8	8.2	8.0	7.6	8.1
Protein (%) 14%/0% moisture basis	8.6/10.0	8.1/9.4	8.5/9.9	8.9/10.3	8.8/10.2	9.1/10.6	8.6/10.0	8.0/9.3	8.5/9.8
Ash (%) 14%/0% moisture basis	0.45/0.52	0.42/0.49	0.44/0.51	0.43/0.50	0.41/0.48	0.44/0.51	0.45/0.52	0.42/0.49	0.44/0.51
Wet Gluten (%)	22.1	20.6	22.3	23.1	22.0	24.1	21.9	20.4	22.1
Gluten Index	90.1			94.5			89.0		
Falling Number (sec)	335	333	336	336	338	334	335	332	338
Amylograph Viscosity 65 g (BU)	510	419	489	525	437	489	507	417	505
Starch Damage (%)	4.1	4.8	4.4	3.8	4.4	4.3	4.2	4.9	4.4
Solvent Retention Capacity (%)									
Water/50% Sucrose	56/111	55/112		56/114	56/119		57/107	56/109	
5% Lactic Acid/5% Sodium Carbonate	115/84	110/83		119/84	115/86		110/81	107/82	
Dough Properties:									
Farinograph:									
Peak Time (min)	1.6	1.4	1.7	1.8	1.6	2.1	1.6	1.4	1.6
Stability (min)	3.0	2.8	3.2	3.1	2.8	3.5	3.0	2.8	3.1
Absorption (%)	53.1	52.5	52.6	53.4	52.8	53.7	53.0	52.5	52.4
Alveograph: P (mm)	34	34	35	38	35	39	33	34	34
L (mm)	107	90	105	113	105	112	105	89	104
W (10-4 joules)	90	78	88	105	90	112	86	76	85
Baking Evaluation:									
Crumb Grain	5.3	5.5	5.8	5.5	5.3	5.9	5.3	5.5	5.8
Crumb Texture	5.8	5.8	5.9	5.9	6.2	6.4	5.8	5.7	5.9
Loaf Volume (cc)	723	722	750	724	735	762	722	720	750
Cookie Spread Ratio	8.3	8.0	8.4	8.2	8.1	8.3	8.4	8.0	8.5
% of Area Sampled:	100%			19%			81%		

* East Coast - Maryland, Virginia, North Carolina; Gulf Ports - Arkansas, Illinois, Indiana, Kentucky, Missouri and Ohio

Export Cargo Data

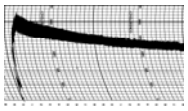
Soft Red Winter	2004	2003
Wheat Grade Data:		
Test Weight (lb/bu)	58.8	59.3
(kg/hl)	77.4	78.0
Damaged Kernels (%)	2.8	2.7
Foreign Material (%)	0.1	0.1
Shrunken & Broken (%)	0.9	0.8
Total Defects (%)	3.8	3.7
Grade	2 SRW	2 SRW
Wheat Non-Grade Data:		
Dockage (%)	0.6	0.7
Moisture (%)	13.1	12.8
Protein (%) 12%/0% moisture basis	10.4/11.8	10.2/11.6
Ash (%) 14%/0% moisture basis	1.57/1.83	1.57/1.82
1000 Kernel Weight (g)	29.9	30.4
Kernel Size (%) lg/md/sm	81/18/1	81/18/1
Single Kernel: Hardness	*	28.7
Weight (mg)	*	31.5
Diameter (mm)	*	2.34
Sedimentation (cc)	12.6	12.6
Falling Number (sec)	319	354
Flour Data:		
Extraction Rate (%)	70.1	70.1
Color: L*	93.1	92.6
a*	-3.3	-2.8
b*	7.7	7.8
Protein (%) 14%/0% moisture basis	8.6/10.0	8.4/9.8
Ash (%) 14%/0% moisture basis	0.44/0.51	0.44/0.51
Wet Gluten (%)	22.7	20.9
Gluten Index	69.4	
Falling Number (sec)	314	354
Amylograph Viscosity 65 g (BU)	378	410
Starch Damage (%)		
Solvent Retention Capacity (%)		
Water/50% Sucrose		
5% Lactic Acid/5% Sodium Carbonate		
Dough Properties:		
Farinograph:		
Peak Time (min)	1.4	1.4
Stability (min)	3.1	3.0
Absorption (%)	52.5	52.9
Alveograph: P (mm)	38	40
L (mm)	100	93
W (10-4 joules)	105	103
Baking Evaluation:		
Crumb Grain	5.4	5.6
Crumb Texture	5.9	5.8
Loaf Volume (cc)	713	721
Cookie Spread Ratio	8.1	7.8
Sample Count:	45	112

* Data not yet available.

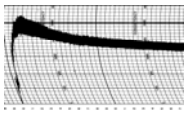
2004 Farinograms and Alveograms

Farinograms:

Gulf

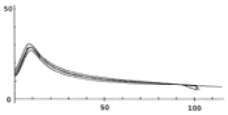


Atlantic



Alveograms:

Gulf



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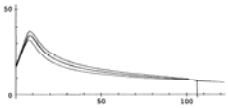
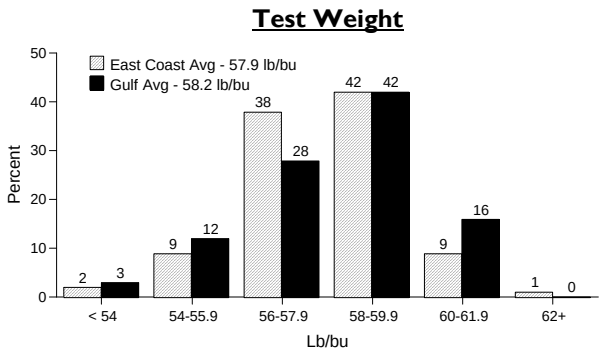
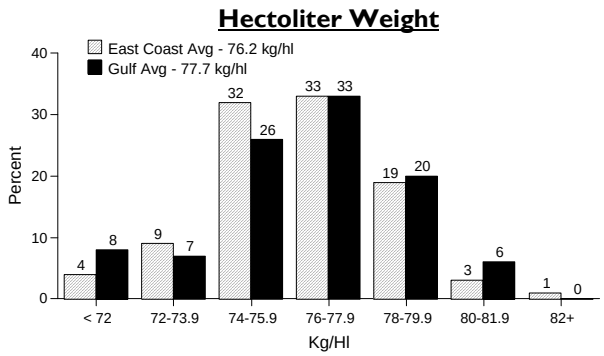
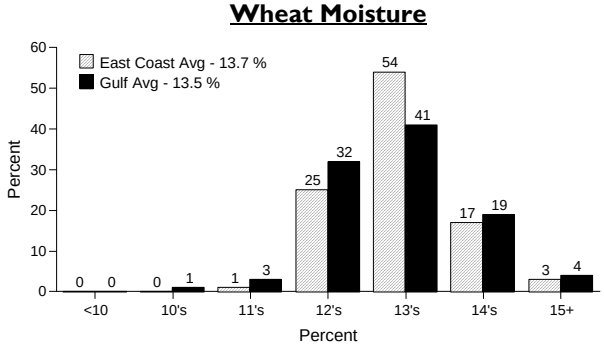
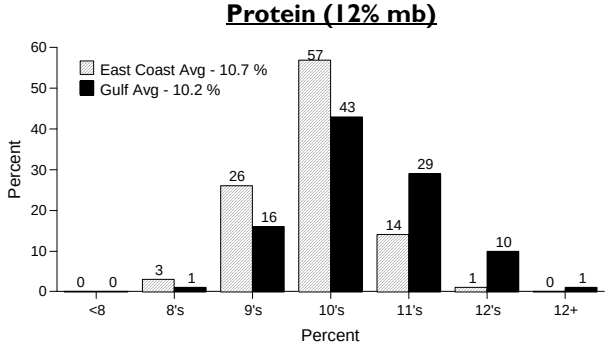


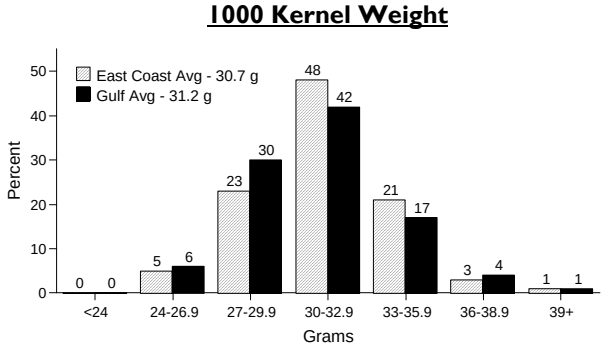
Of the sixteen-state soft red winter wheat growing area, survey samples were collected in nine states.

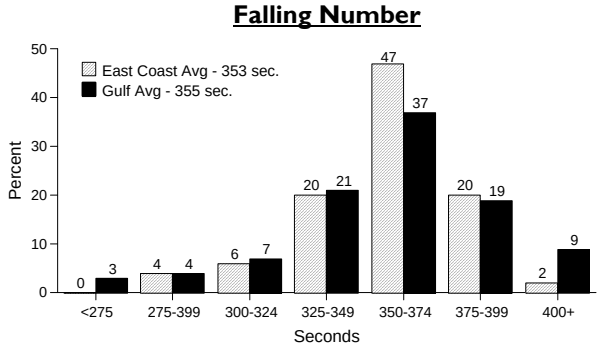












(continued from p. 18)

Flour and Baking Data. Flour yield is higher than last year by one percentage point or more but still below the five-year average for Composite Average and Gulf Ports. Baking performance is similar to last year and the five-year average for samples tested.

Summary: Compared with the five-year averages the 2004 SRW crop generally has higher moisture; lower test weight, thousand kernel weight and flour yield; and slightly higher protein and Falling Number results. Grade factors show the crop to be well within the limits for U.S. No. 2 SRW. Overall, the flour from this crop has good functionality.

Wheat buyers should always specify important quality requirements such as protein, moisture content, and falling number. Specifications for falling number and for DON should be considered

Export Cargo Survey

The export cargo data show the results of analysis of 157 individual sublot samples for marketing years 2004 and 2003 from Gulf of Mexico and East Coast ports. Samples were randomly selected from official Federal Grain Inspection Service samples. Grade data are the actual official grades on the individual sublots. Milling and baking analyses were conducted by CII Laboratory Services.

Durum Wheat

Northern Great Plains

The 2004 durum crop produced in North Dakota and Montana crop averages No. 1 HAD, and production is only 2% smaller than 2003, despite a growing season that brought diverse weather challenges. A cold, wet spring was followed by an unusually cool summer, a late August frost and a very protracted harvest season. The wet spring caused planted area to fall by 12%, and the late August frost and delayed harvest season created a more variable quality profile than 2003. The unusually cool summer benefited crop yields, however, enabling per acre yields to rise to the highest level since 1998.

Weather and Harvest: Durum planting began in late April and progressed ahead of normal in southern and central locations through mid-May, reaching slightly more than 50% complete. Northern areas were delayed from planting until mid-May due to cold soil temperatures, and were delayed even further by a late season rain and snow storm. This seriously delayed completion of planting until early to mid June in key durum producing areas in the north with only 85% of the crop planted by the middle of June.

Growing conditions in July and August continued with below normal temperatures for most of the region and above normal rainfall for northern areas. The cool temperatures enhanced crop condition ratings and yield potential, but also caused crop maturity to fall well behind normal, leaving the late planted crop in northern areas vulnerable to freezing temperatures which occurred on August 20. Damage from the frost was variable but was significant in isolated areas. Disease and insect pressures were relatively minor across the region due to the diverse crop maturity and cooler temperatures.

Harvest began in early August in southwestern locations, but only reached 30% complete by the first week of September. High crop moisture content, cool daytime temperatures and slow crop maturity did not allow a rapid harvest pace. By the end of September harvest was still only two-thirds complete, a full three weeks behind normal. Approximately 15% of the crop remained to be harvested in late October, primarily in extreme northern areas.

Quality: The quality summary for the 2004 crop in the Northern Plains is based on analysis of 193 samples collected directly from producers at harvest. Between August 30 and October 6, 152 samples were collected from North Dakota and 41 from Montana. Due to the very late harvest this year, samples were not able to be collected on the last 15% of the crop. This portion of the crop was impacted by a late August frost, and does have varied levels of frost damage. In many cases yield and quality loss were likely sufficient enough to cause abandonment of the crop or limit it to only feed use.

The crop averages No. 1 HAD with nearly 69% grading No. 1 HAD. This is higher than the 59% which graded No. 1 HAD last year. The average test weight is 61.7 lbs/bu (80.3 kg/hl), up from 61 pounds last year and 2 pounds above the five-year average. Thousand kernel weights are also up significantly from last year at 40.2 grams as compared to 33.8 grams. Total damage averages 0.3%, equal to last year's exceptional crop and well below the five-year average. The crop is slightly lower than last year in average vitreous kernel count, 89% as compared to 92% but still higher than the five-year average of 85%.

Due to higher than average yields and a cool summer, regional average protein content is down by more than a point compared to last year, 13.4% versus 14.5%. Protein levels are especially lower in northwestern parts of the region compared to last year and five-year averages. Delayed crop maturity and a cool, wet harvest period did raise average crop moisture levels and also reduced average falling number values with some incidence of sprout. Moisture is 12.5%, well above the 10.5% last year and also above the five-year average. The falling number average for the regional crop is 356 seconds, down from 391 last year, but still above the five-year average of 301 seconds.

Milling extractions are up significantly from 2003 with 71.2% total extraction and 64.3% semolina extraction. Ash levels are slightly lower than last year and the five-year average. Speck counts are somewhat higher than a year ago but still lower than the five-year average. Due to the lower protein content in the crop, wet gluten is lower than a year ago, but average semolina mixing strength, as measured by the mixograph is equal to last year and the five-year average, recording a mixogram classification of 6 on a scale of 1-8.

The quality of the cooked pasta is somewhat lower than a year ago, and slightly lower than the five-year average. The regional average color score is a 8.9 on a scale of 1-12, as compared to 9.4 last year. Cooked firmness is 5.4 grams per centimeter, down from 6.0 last year and 6.1 for a five-year average.

The 2004 crop with its exceptionally high grade profile, high test weights and improved extraction should please buyers. There is more variability in quality as compared to 2004, and notable differences do exist across the region, especially for protein content, vitreous kernel counts and falling number. Damaged kernel counts are again low but some isolated areas do have higher levels of frost and sprout damage this year. Buyers are encouraged to use appropriate contract specifications to get the quality and value they need.

Pacific Southwest

Desert Durum ®, a trademark of the Arizona Grain Research and Promotion Council and the California Wheat Commission, applies only to durum wheat produced in the states of Arizona and California.

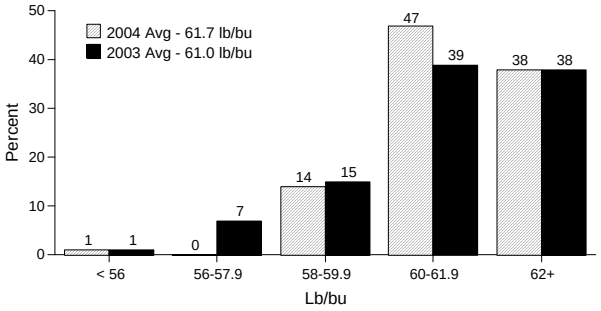
Desert Durum ® is usually delivered "identify preserved" to US domestic and export markets. The identity preservation system allows buyers to purchase grain of varieties having intrinsic quality parameters specific to their needs. Requirements can be contracted before planting with experienced growers using certified seed and storing the grain for season-long shipment at the buyer's schedule.

(continued on page 25)

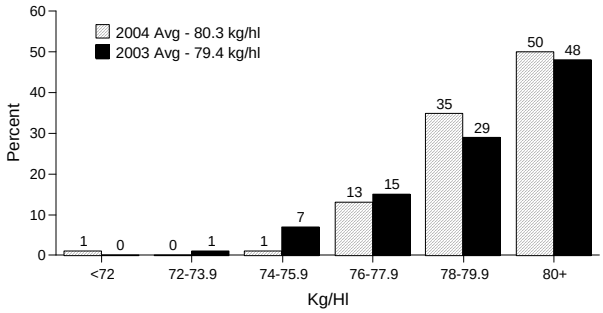
Harvest and Export Data

Durum	Harvest Data					Export Cargo Data			
	Great Plains		5-Year	Pacific Southwest		Great Plains		Pacific Southwest	
	2004	2003	Avg.	2004	2003	2003	2002	2003	2002
Wheat Grade Data:									
Test Weight (lb/bu)	61.7	61.0	59.7	61.5	62.7	60.8	60.1	62.9	62.8
(kg/hl)	80.3	79.4	77.7	80.1	81.6	79.2	78.3	81.9	81.8
Damaged Kernels (%)	0.3	0.3	2.3	0.4	0.1	2.6	5.2	0.7	0.8
Foreign Material (%)	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.2	0.1
Shrunken and Broken (%)	0.9	1.3	1.7	0.4	0.4	1.6	1.6	0.6	0.6
Total Defects (%)	1.2	1.6	4.1	1.0	0.7	4.4	7.1	1.5	1.5
Contrasting Classes (%)	0.0	0.2	0.3	0.0	0.0	1.7	0.6	0.3	0.0
Vitreous Kernels (%)	89.0	92.0	84.6	98.0	96.0	84.9	75.7	92.9	95.1
Grade	1 HAD	1 HAD	2 HAD	1 HAD	1 HAD	2 HAD	3 HAD	1 HAD	1 HAD
Wheat Non-Grade Data:									
Dockage (%)	1.2	0.7	1.5	0.5	0.3	0.6	0.7	0.5	0.4
Moisture (%)	12.5	10.5	11.5	6.6	6.8	11.0	11.5	7.6	6.6
Protein (%) 12%/0% moisture basis	13.4/15.2	14.5/16.4	14.2/16.1	14.0/15.9	13.6/15.5	14.5/16.4	13.8/15.7	13.3/15.1	13.0/14.8
Ash (%) 14%/0% moisture basis	1.50/1.75	1.53/1.78	1.64/1.91	1.75/2.04	1.74/2.02	1.57/1.82	1.67/1.95	1.60/1.86	1.67/1.94
1000 Kernel Weight (g)	40.2	33.8	36.1	48.0	52.5	35.5	38.4	48.9	48.5
Kernel Size (%) lg/md/sm	60/36/4	42/50/8	52/40/8	93/7/0	94/6/0	42/49/9	54/38/8	82/15/3	86/12/2
Falling Number (sec)	356	391	301			368	384	876	950
Sedimentation (cc)	49	51	46						
Semolina Data:									
Total Extraction (%)	71.2	68.8	70.2	74.0	73.9	68.7	69.6	71.8	71.1
Semolina Extraction (%)	64.3	62.9	63.7	62.2	62.9	61.9	62.6	64.9	64.0
Ash (%) 14%/0% moisture basis	0.64/0.74	0.66/0.77	0.69/0.81	0.80/0.93	0.69/0.80	0.67/0.78	0.71/0.82	0.66/0.77	0.67/0.78
Specks (no/10 sq in)	20	12	23	14	8	15	26	19	14
Protein (%) 14%/0% moisture basis	12.4/14.5	13.5/15.6	13.1/15.3	12.7/14.7	11.3/13.1	13.5/15.6	12.8/14.9	12.1/14.1	11.7/13.5
Wet Gluten (%)	35.0	37.2	37.2	36.2	33.7				
Gluten Index	43.7					44.2		76.6	
Mixograph Classification	6.0	6.0	6.0			5.3	5.6	6.7	7.1
Alveograph: P (mm)	44	38	35						
L (mm)	90	99	105						
W (10-4 joules)	96	92	82	163	178				
Color: L*	84.9	84.7	84.4			75.5	84.2	84.0	85.0
a*	-2.9	-2.8	-2.7			-0.3	-2.4	-2.6	-2.9
b*	25.9	28.4	27.7	27.0	26.5	34.6	24.9	26.5	26.8
Spaghetti Procesing Data:									
Color Score	8.9	9.4	9.0	9.0	9.0	8.9	8.3	9.2	9.6
Cooked Weight (gm)	30.5	30.9	31.4	29.9	30.3	30.7	30.8	31.1	30.9
Cooking Loss (%)	5.9	5.6	5.8	7.2	7.8	5.4	6.0	5.8	6.0
Cooked Firmness (g cm)	5.4	6.0	6.1	7.9	7.1	5.8	5.5	5.4	5.5
Sample Count:						19	21	26	17

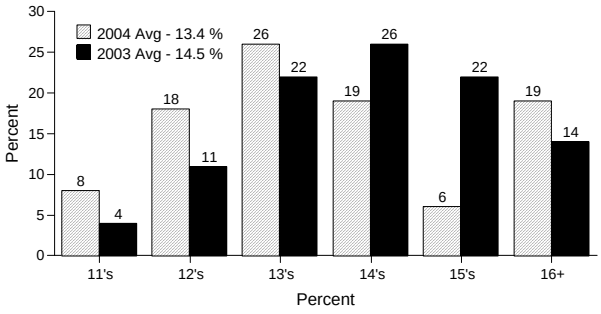
Test Weight



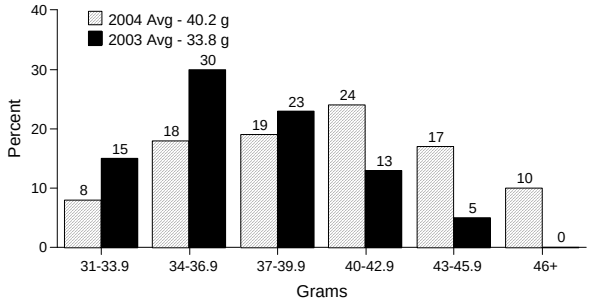
Hectoliter Weight



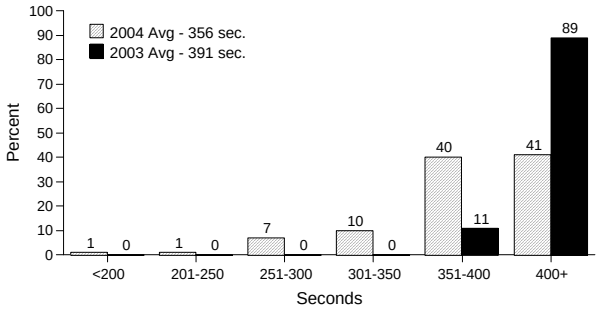
Protein (12% mb)



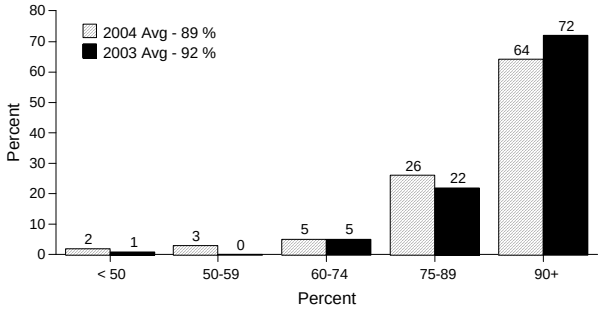
1000 Kernel Weight



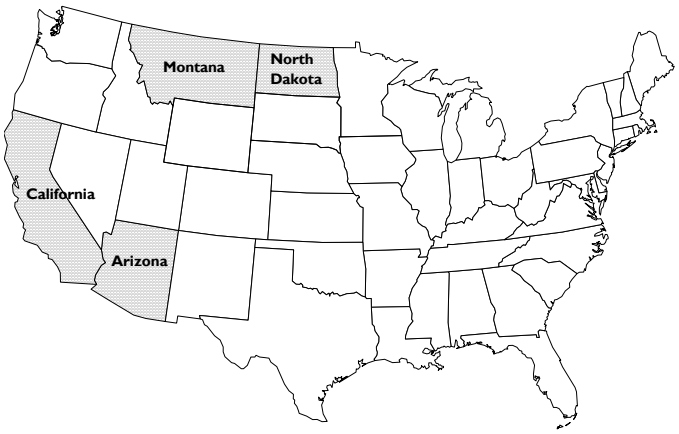
Falling Number

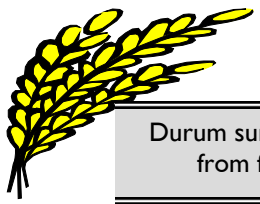


Vitreous Kernels



Note: Charts include Great Plains durum only.





Durum survey results are from four states.

Durum Production by Crop Year

for the major producing states
(million metric tons)

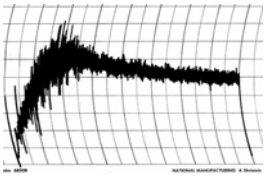
	2004	2003	2002	2001	2000
Arizona	0.26	0.31	0.24	0.22	0.20
California	0.24	0.31	0.24	0.23	0.24
Montana	0.48	0.39	0.35	0.32	0.26
North Dakota	1.46	1.59	1.33	1.49	1.96
Total U.S.	**2.46**	**2.63**	**2.18**	**2.27**	**2.70**

Based on USDA crop estimates of September 30, 2004.

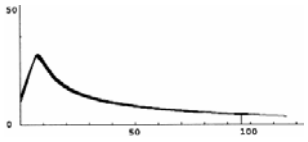
2004 Great Plains Durum Mixogram and Alveogram

Regional Average Mixogram:

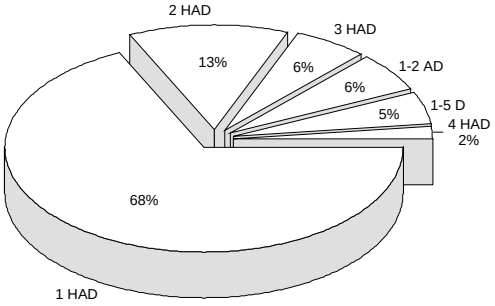
(score = 6)



Alveogram:



Great Plains Durum Grade Distribution



(continued from page 22)

Desert Durum ® varieties have consistent kernel size, low moisture (6%-8%), strong gluten properties and very good color. This year, some areas of the Desert Durum growing region experienced extremely hot temperatures during the maturing stages of the crop. This resulted in higher than usual protein levels and lower than normal yields and test weights. Vitreous counts were high and the crop averaged U.S. No. 1 HAD.

Export Cargo Survey

The durum export cargo survey shows the results of analysis of 45 individual sublot samples for crop year 2003 (collected from October 2003 through June 2004) and 38 samples for 2002. The samples were randomly selected from official Federal Grain Inspection Service samples. Grade data are the actual official grades on the individual sublots. Processing analysis was conducted by North Dakota State University.

Hard White Wheat

Harvest Survey

Hard white wheat samples were made into six composites based on regions (Pacific Northwest, Southern Plains, and California) and protein levels (less than 11.5%, 11.5 – 12.5%, 12.6 – 13.5%, and greater than 13.5%). A high protein sample from the Southern Plains was eliminated due to low falling number value. The HW production for the 2004 crop is estimated at 600 thousand metric tons because the production in the Central and Southern Plains was greatly reduced by drought and later by sprout damage.

Survey Methods: Samples were collected by NASS crop quality survey, CII Laboratory Services, Kansas City, Missouri, and by California Wheat Commission. Wheat grading was conducted by Federal Grain Inspection Service (FGIS), Portland, Oregon. All other tests were conducted by the Wheat Marketing Center (WMC), Portland, Oregon. Wheat and flour tests were done according to the American Association of Cereal Chemists Methods (10th Edition). Chinese raw and wet noodle testing and Chinese northern-type and Taiwan-type steamed bread evaluation were conducted according to the protocols established by Chinese noodle and steamed bread makers and flour millers at the WMC during U.S. Wheat Associates' Asian Products Collaborative Program.

Wheat and Grade Data: All six samples were graded as U.S. No. 1 with test weights from 60.1 to 65.3 lb/bu (79.1 to 85.8 kg/hl). In general, PNW and California wheat samples had lower wheat moisture content than samples from the Southern Plains. California had the largest thousand-kernel weight and kernel diameter, while Southern Plains had the smallest thousand-kernel weight and kernel diameter. Falling number values ranged from 290 to 427 seconds.

Flour, Dough, and Baking Data: Buhler straight grade flour extractions ranged from 68.2 to 70.3% and flour ash contents varied from 0.36 to 0.46%. All flour falling number values were 370 seconds or higher. Amylograph peak viscosities were between 365 and 780 BU. Starch damage values were in the range of 4.4 to 5.8%. Farinograph water absorption ranged from 53.8 to 66.0%, peak times varied from 2.1 to 26 minutes, and stability times were 14.5 minutes or longer for all samples. Southern Plains had the lowest alveograph maximum overpressure ("P") value of 80 mm. Extensigraph data indicated that gluten was strong. The bake absorption was in the range of 58.9-65.1%, and loaf volume ranged from 704 to 888 ml. Two wheats from California and one very high protein from PNW showed better pan bread quality than the commercial bread control flour.

Noodle Evaluation: Both Chinese raw noodles (white salted) and Chinese wet noodles (yellow alkaline) were made from each of the HW flours. A control flour was included in each noodle type for evaluation comparison. Chinese raw noodle color was acceptable for most samples except for wheat of 14.2% protein from PNW and low protein Southern Plains. The boiled noodle texture was acceptable for PNW low protein and medium protein wheats, but was slightly soft for wheat from other regions. Similar to Chinese raw noodles, Chinese wet noodle color was acceptable for most samples except for wheat from Southern Plains, which was a little dark. The texture of boiled Chinese wet noodles was acceptable for all samples.

Chinese Steamed Bread: Two types of Chinese steamed breads were evaluated for HW flours: Chinese northern-type and Taiwan-type. A control steamed bread flour was included for comparison. Results indicated that a majority of samples produced steamed breads that were similar to or better than the control flour for both types of steamed breads.

(continued on page 29)

Composite Average Alveograms

PNW Low Protein

PNW Medium Protein

Very High Protein

Southern Plains Low Protein

California High Protein

California very High Protein

Harvest Data

Hard White	Pacific Northwest			Southern Plains	California	
	Low*	Medium	Very High	Low**	High	Very High
Wheat Grade Data:						
Test Weight (lb/bu)	62.4	60.9	61.9	60.1	65.3	63.8
(kg/hl)	82.0	80.1	81.4	79.1	85.8	83.8
Heat Damage (%)	0.0	0.0	0.0	0.0	0.0	0.0
Damaged Kernels Total (%)	0.0	0.0	0.0	0.3	0.0	0.0
Foreign Material (%)	0.0	0.0	0.1	0.1	0.0	0.0
Shrunken & Broken (%)	0.8	1.3	0.5	1.1	0.1	0.1
Total Defects (%)	0.8	1.3	0.6	1.5	0.1	0.1
Grade	1 HW	1 HW	1 HW	1 HW	1 HW	1 HW
Wheat Non-Grade Data:						
Dockage (%)	0.2	0.9	0.3	0.3	0.1	0.1
Moisture (%)	9.7	9.6	8.6	11.5	9.4	9.1
Protein (%) 12%/0% moisture basis	11.1/12.6	12.2/13.9	14.2/16.1	11.4/13.0	12.9/14.7	14.7/16.7
Ash (%) 14%/0% moisture basis	1.32/1.53	1.52/1.77	1.53/1.78	1.57/1.83	1.41/1.64	1.51/1.76
1000 Kernel Weight (g)	34.0	32.0	33.6	25.9	47.5	45.1
Kernel Size (%) lg/md/sm	82/18/0	70/29/1	80/20/0	39/59/2	96/4/0	95/5/0
Single Kernel: Hardness	57.1	69.3	65.3	75.3	61.8	60.6
Weight (mg)	33.8	34.3	34.9	25.6	47.8	45.2
Diameter (mm)	2.45	2.44	2.46	2.10	2.97	2.87
Sedimentation (cc)	25.2	17.5	30.8	9.9	28.9	29.4
Falling Number (sec)	321	427	383	290	397	384
Flour Data:						
Extraction Rate (%)	68.5	69.3	68.2	68.7	70.3	69.2
Color: L*	92.4	91.8	92.1	91.6	92.1	91.9
a*	-2.4	-2.8	-2.3	-2.5	-2.0	-2.0
b*	6.1	8.4	6.7	6.6	5.4	5.6
Protein (%) 14%/0% moisture basis	9.8/11.4	10.7/12.4	13.2/15.3	9.8/11.4	12.1/14.1	13.3/15.5
Ash (%) 14%/0% moisture basis	0.37/0.43	0.40/0.47	0.36/0.42	0.46/0.53	0.36/0.42	0.36/0.42
Wet Gluten (%)	25.2	29.5	35.0	27.9	35.1	38.6
Gluten Index	98.2	93.3	93.7	94.0	93.8	89.4
Falling Number (sec)	408	443	381	370	440	462
Amylograph Viscosity 65 g (BU)	755	770	780	365	575	565
Starch Damage (%)	4.4	5.8	4.9	5.2	5.8	5.1
Dough Properties:						
Farinograph:						
Peak Time (min)	2.1	2.4	26.0	2.5	10.0	21.7
Stability (min)	49.8	48.7	32.2	14.5	33.3	27.4
Absorption (%)	55.9	57.0	61.8	53.8	64.2	66.0
Alveograph: P (mm)	100	110	115	80	155	153
L (mm)	87	84	134	107	89	113
W (10-4 joules)	337	334	517	287	484	601
Extensigraph: Resistance (BU)	425/720	640/890	490/730	490/720	415/600	490/740
(45/135 min) Extension (cm)	18.6/14.7	12.6/11.0	16.4/10.5	16.7/15.3	16.6/17.2	19.2/11.0
Area (sq cm)	110/139	108/119	102/99	116/146	95/132	120/103
Baking Evaluation:						
Bake Absorption (%)	60.0	62.1	65.0	58.9	64.7	65.1
Crumb Grain and Texture	5.3	5.8	7.0	4.8	6.5	6.8
Loaf Volume (cc)	714	759	882	704	879	888

* Low: Less than 11.5%; Med: 11.5 - 12.5%; High: 12.5 - 13.5%; Very High: greater than 13.5%. **Low: less than 12.5%

Harvest Data

Hard White	Pacific Northwest			Southern Plains	California	
	Low*	Medium	Very High	Low**	High	Very High
Chinese Raw Noodle-Making Quality:						
Color at 0/24 hour: L*	85.3/76.1	84.1/76.4	82.6/72.0	81.7/72.7	83.9/73.9	81.7/71.9
a*	-0.9/-0.4	-1.0/-0.7	-0.4/0.0	-1.1/-0.6	0.0/0.5	0.2/0.7
b*	16.8/22.4	20.1/26.3	19.0/23.6	17.0/21.9	14.7/20.3	17.1/21.0
Change in L* (0-24 hr)	9.2	7.7	10.6	9.0	10.1	9.7
Cooking Yield (%)	130	129	121	125	126	123
Sensory Color Stability Score	8.2	7.7	6.2	6.3	6.7	6.8
Instrumental Texture:						
Firmness (g)	1121	1184	1032	1106	933	1072
Springiness (%)	96.0	97.6	96.4	95.8	96.7	97.2
Cohesiveness	0.67	0.66	0.68	0.65	0.68	0.67
Chewiness (g)	714	762	680	690	610	697
Chinese Wet Noodle-Making Quality:						
Uncooked Color at 0/24 hour: L*	82.9/74.5	84.0/75.9	81.0/69.9	80.3/70.4	81.6/71.4	81.2/70.2
	-2.2/-1.7	-2.2/-1.9	-1.9/-1.4	-2.4/-1.5	-1.5/-1.3	-1.4/-1.2
	20.5/23.9	20.4/24.8	20.8/22.8	19.5/22.0	18.0/21.3	17.9/21.3
Change in L* (0-24 hr)	8.5	8.0	11.2	9.9	10.1	11.0
Parboiled Color at 0/24 hour: L*	78.7/79.9	79.3/80.2	77.4/78.2	76.9/77.7	77.7/78.9	78.2/78.5
a	-3.6/-3.6	-3.9/-4.1	-3.2/-3.3	-3.6/-3.8	-2.7/-3.0	-2.3/-2.8
b	27.0/26.5	29.7/29.2	26.4/26.4	26.2/25.5	24.1/24.4	25.1/24.0
Cooking Yield (1.5 min, %)	71	71	70	73	70	72
Uncooked Color Stability Score	7.8	7.3	6.0	6.3	6.8	6.0
Parboiled Color Stability Score	7.8	7.8	7.0	6.8	7.5	6.8
Instrumental Texture:						
Firmness (g)	770	858	793	852	756	763
Springiness (%)	97.0	97.3	96.6	96.2	97.9	96.5
Cohesiveness	0.67	0.65	0.66	0.63	0.67	0.67
Chewiness (g)	498	540	508	515	493	490
Chinese Northern-Type Steamed Bread Evaluation:						
Specific Volume (ml/g)	2.96	1.85	2.63	2.46	2.84	2.80
Total Score	73.5	67.0	77.0	74.8	76.5	76.8
Taiwan-Type Steamed Bread Evaluation:						
Specific Volume (ml/g)	2.46	2.62	2.36	3.26	2.91	3.24
Total Score	66.0	71.3	70.0	70.5	73.5	75.0

* Low: Less than 11.5%; Med: 11.5 - 12.5%; High: 12.5 - 13.5%; Very High: greater than 13.5%. **Low: less than 12.5%

Composite Average Farinograms

PNW Low Protein

PNW Medium Protein

PNW Very High Protein

Southern Plains Low Protein

California Low Protein

California Very High Protein

U.S. Production by Class

Crop Year (Beginning June 1)
(million metric tons)

	2004	2003	2003	2002	2001
Hard Red Winter	23.30	29.15	16.88	20.87	23.03
Soft Red Winter	10.35	10.35	8.74	10.88	12.83
Hard Red Spring	14.43	13.60	9.57	12.94	13.67
Soft White	7.23	6.99	6.42	6.31	8.25
Hard White	1.20	0.27	0.33	0.26	n/a
Durum	2.46	2.63	2.18	2.27	2.70
Total	58.88	63.82	43.71	53.26	62.57

Estimates are based on USDA crop estimates of September 30, 2004. The soft white and hard white estimates are made by US Wheat Associates; hard white includes some production which USDA has included in red wheats.

U.S. Supply and Demand

Estimated for 2004/2005 (year beginning June 1)
(million metric tons)

	HRW	HRS	SRW	White	Durum	TOTAL
Supply:						
Beginning Stocks	6.2	4.3	1.7	2.0	0.7	14.9
Production	23.3	14.4	10.3	8.3	2.4	58.9
Total Supply	29.5	18.9	12.4	10.5	4.0	75.4
Demand:						
Domestic Use	13.5	7.2	7.2	3.2	2.3	33.4
Exports	9.7	7.1	4.1	4.9	0.8	26.5
Total Demand	23.2	14.3	11.3	8.1	3.1	59.9
Ending Stocks	6.3	4.7	1.1	2.4	0.9	15.5

Based on USDA Supply/Demand estimates of October 12, 2004.

(continued from page 26)

Summary: This year, the U.S. HW production decreased substantially in the Central and Southern Plains due to drought early in the growing season and rain during the harvest. Much of the HW grown in the region had low falling numbers, so wheat was not tested for this report. However, HW produced in the western region (PNW and California) showed good quality for milling, dough rheology, and end product performance in baking, Chinese noodles, and steamed breads.

(continued from page 12)

Export Cargo Survey

The export cargo survey shows the results of analysis of 171 individual sublot samples for crop year 2003 (collected from October through August) and 250 for crop year 2002. Of the 171 2003 samples, 101 were collected from PNW ports, 36 from the Lakes and 34 from Gulf ports. The samples were randomly selected from official Federal Grain Inspection Service samples. Grade data are the official grades on the individual sublots. Milling and baking analyses were conducted by North Dakota State University.

Analysis Methods

With the exception of the Mennel soft red winter survey, both th harvest samples and cargo samples for each class were evaluated in the same methods as described below. All flour, semolina and end-use tests utilize flour or semolina produced as documented below under the methods labeled "Extraction." The Mennel data were volunteered by individual participating mills which may have used other methods.

Wheat and Grade Data

Grade: Official U.S. Standards for Grain.
Dockage: Official USDA procedure using the Carter Dockage Tester.
Moisture: HRS, Durum, SW, HW - Motomco Moisture Meter and AACC 44-15A. HRW, SRW - AACC 44-15A.
Test Weight: AACC 55-10; test weight is mathematically converted to hectoliter weight: for durum - kg/hl = lb/bu x 1.292 + 0.630, for other wheats - kg/hl = lb/bu x 1.292 + 1.419.
Protein: AACC 46-30 (Combustion Nitrogen Analysis technique).
Single Kernel Characterization: Perten method using Perten SKCS 4100.
Sedimentation: HRS, HRW (Plains), SRW, SW, HW - AACC 56-61A; Durum - AACC 56-70.
1000 Kernel Weight: HRS, Durum, HRW, SRW - based on a 10-gram sample of clean wheat counted by an electronic counter. SW, HW - based on three 100-kernel sample weight.
Ash: AACC 08-01 expressed on a 14% moisture basis.
Falling Number: AACC 56-81B. An average value is a simple mean of sample results.
Vitreous Kernels: HRS & durum only - Percentage by weight of vitreous kernels hand-picked from a 50-gram sample of clean wheat.
Kernel Size Distribution: *Cereal Foods World* (*Cereal Science Today*) 5:(3), 71 (1960). Wheat is sifted with a RoTap sifter using a Tyler No. 7 screen (2.82 mm) and a Tyler No. 9 screen (2.00 mm). Kernels retained on the No. 7 screen are classified as "Large." Kernels passing through the No. 7 screen and retained on the No. 9 screen are "Medium." Kernels passing through the No. 9 screen are "Small."

Flour Data

Extraction: Samples were cleaned and tempered according to AACC Method 26-10A. All samples within each class other than California HRW were milled with identical mill settings on a Buhler laboratory mill as described in the following procedures: SW - AACC 26-31; HW - AACC 26-31A; HRW (Midwestern), SRW, and HRS - AACC 26-21A. California HRW was milled on a Brabender Quadrumat Senior mill using the Brabender procedure. All extraction rates were calculated against total products on an "as is" moisture basis.
Ash: AACC 08-01, reported on a 14% moisture basis.
Color: HRW and SRW - Minolta Method using Minolta Chroma Meter CR-110 (for HRW and SRW) or CR-310 (for HRS, SW, and HW) with Granular-Materials Attachment CR-A50. CIE 1976 L*a*b* color system: L* indicates white-black, a* - red-green, and b* - yellow-blue.
Protein: AACC 46-30 (Combustion Nitrogen Analysis technique).
Wet Gluten: HRS, SRW, HW, HRW (Plains) - AACC 38-12; SW - AACC 38-12 (water reduced from 4.8 to 4.2ml); HRW (CA) - Glutomatic Method (ICC 137).
Falling Number: AACC 56-81B. An average value is a simple mean of sample results.
Farinograph: AACC 54-21 with 50-gram bowl. Absorption except HRW (CA) is reported on 14% moisture basis. HRW (CA) reports "as is" absorption. Classification (HRS only) incorporates peak time, mixing tolerance, and general curve characteristics to assign rating based on a scale of 1-8. Higher numbers indicate stronger protein flours.
Alveograph: Durum - AACC 54-30A modified. Other classes - AACC 54-30A.
Amylograph: HRS (100g) - AACC 22-10. HRS (65g), SRW, SW, HRW, HW - AACC 22-10 modified to use 65g flour (14% moisture basis) and 450ml distilled water with paddle (HRS) or pins (other classes).
Extensigraph: AACC 54-10, modified 45 min. and 135 min. stretch, HRS, HRW, HW.
Starch Damage: AACC Method 76-31.
Solvent Retention Capacity (SRC): AACC Method 56-11.

Semolina Data (Durum only)

Extraction: Great Plains samples were milled using a modified Buhler laboratory mill with identical settings and equipped with Miag laboratory purifiers, as described by Vasiljevic and Banasik 1980: *Quality Testing Methods for Durum Wheat and its Products*, pp. 64-72, Dept. of Cereal Chemistry and Technology, NDSU, Fargo, ND. Roll gaps have been modified to (in mm): B1-0.762; B2-0.305; B3-0.254; R1-0.102; B4-0.076; B5-0.038. Extraction rates were calculated against total products on an "as is" moisture basis. Procedure is derived from AACC 26-41 based on research showing improved correlation between laboratory and commercially milled semolina quality. Pacific Southwest samples were milled on a Modified Chopin CD2 mill.
Ash: AACC 08-01 on 14.0% moisture basis.
Color: Minolta Method using Minolta Chroma Meter CR-310
Protein: AACC 46-30 (Combustion Nitrogen Analysis technique).
Wet Gluten: AACC 38-12 Glutomatic procedure.
Specks: Sample is pressed under 3x4 inch glass plate, and number of specks within one-inch square marked on plate are counted. Average of three determinations is expressed as specks per 10 square inches.
Mixogram: Ten grams of semolina are mixed in a 10-gram mixograph bowl with 5.8 ml of distilled water to give maximum dough consistency. An overall empirical classification incorporating peak height and general curve characteristics is assigned based on comparison with eight reference mixograms. The higher the number, the stronger the curve type.

Baking, Noodle, Steamed Bread and Spaghetti Data

HRW & SRW: AACC Method 10-10B producing two loaves per batch using wet compressed yeast and ascorbic acid. After mixing, dough is divided into two equal portions, fermented for 160 min., proofed and baked in "pup loaf" pans. Loaf volume is measured immediately after baking by rapeseed displacement. California HRW only - AACC Method 10-10B producing two loaves per batch using wet compressed yeast, malt flour, 45 ppm ascorbic acid, and 120 min. fermentation. Loaf volume measured immediately after baking. SRW cookie spread ratio - AACC Method 10-50D.

HRS: AACC Method 10-09, modified: fungal amylase (15 SKB units/100 g flour) replacing malt dry powder; instant dry yeast (1%); 10 ppm bromate, where added oxidants are required; 2% added shortening. Doughs are mechanically punched, moulded, and baked in "Shogren-type" pans. Scoring based on a scale of 1-10. Higher numbers indicate preferred quality attributes.

SW: Cookie diameter - AACC Method 10-52. Sponge cake volume and score - Japanese standard method described by Nagao in Cereal Chemistry 53:977-988, 1976.

Durum: Pasta is made using the laboratory procedure described by Walsh, Ebeling, and Dick, *Cereal Foods World*: 16:(11) 385 (1971). Water (32.0% based on semolina weight) is added to semolina and mixed in a Hobart mixing bowl 3.5 min. Semolina-water mixture is extruded using a DeMaco laboratory pasta extruder. Spaghetti is dried using modified Buhler high-temperature drying cycle as described by Debbouz, Pitz, Moore, and D'Appolonia, *Cereal Chemistry*: 72 (1):128-131. Color scores are determined by the procedure described by Walsh, *Macaroni Journal* 52:(4) 20 (1970), using a Minolta Color Difference Meter (Model: CR 310). Higher values (scale 1-12) are preferred. Cooked weight, cooking loss and firmness are determined by AACC Method 16-50.

HW Baking: AACC Method 10-10B. 180 min fermentation time is used. Loaf volume is measured by laser light using a TexVol Instrument (BVM-L370).

HW Noodle: Two types of Chinese noodles were prepared from each of the HW flours: Chinese raw noodles and Chinese wet noodles. The Chinese raw noodle formula was: flour, 1000 g; salt, 12 g; and distilled water, 280 g. The Chinese wet noodle formula was: flour, 1000 g; salt, 20 g; K2CO3, 4.5 g; Na2CO3, 4.5 g; and water, 320 g. Noodle sheet color is measured by stacking three dough sheets and taking two readings from each side of two dough sheets (a total of eight readings) using a Minolta CR-310 Chroma Meter; the mean value is reported. For Chinese wet noodles, noodle sheet color was measured on both uncooked and parboiled (boiling for 1.5 min) sheets. Cooking Yield is % of weight gain after cooking for 5 min for Chinese raw noodles and for 1.5 min for Chinese wet noodles, rinsing in 27^0 C water and draining. Sensory Noodle Color Stability Score is a total score of noodle color rated at 2 hr and 24 hr against a control sample (an assigned score of 7) and is reported based on a scale of 1-10; higher scores indicate better color stability. The Instrumental Texture is determined on five strands of cooked noodles (2.5 x 1.2 mm for raw noodles, W x T; 1.7 x 1.6 mm for wet noodles, W x T) using a TA.XT2 Texture Analyzer. Firmness indicates noodle bite; springiness indicates the degree of recovery after first bite; cohesiveness is a measure of the extent to which noodle structure is disrupted during first bite; and chewiness is a product of firmness, cohesiveness and springiness (firmness x cohesiveness x springiness) and thus is a single parameter that incorporates the three textural parameters. Higher values of these textural parameters are generally more desirable for Chinese-style noodles.

Chinese Steamed Bread: Three types of Chinese steamed breads were prepared: Chinese southern-type from each of the SW and club wheat flours, and Chinese northern-type and Taiwan-type from each of the HW flours. The Chinese southern-type formula was: flour 500g, sugar 75g, shortening 20g, baking powder 6g, yeast 4g, water 195-215g, and nonfat dry milk powder 15g. The Chinese northern-type formula was: flour 400g, yeast 4g, and water 180-208g. The Taiwan-type formula was: flour 400g, yeast 4g, sugar 16g, shortening 16g, and water 170-180g. Yeast was dissolved in water before use. All steamed breads were prepared using straight dough methods (WMC protocol). The Total Score is the sum of process score (15% of the total) and product score (85%). Process score includes mixing, sheeting, rolling, cutting and fermentation scores. Product score comprises volume, external characteristics, internal characteristics, eating quality and flavor. Each property was rated compared with a control sample. The control flour was scored 70. The Specific Volume is the volume per unit weight product (volume divided by weight).

Wheat Grades and Grade Requirements Table

Grading Factors	Grades U.S. Nos. 1	2	3	4	5
			Minimum limits:		
Test Weight (lbs/bu)					
Hard Red Spring or White Club	58.0	57.0	55.0	53.0	50.0
All other classes and subclasses	60.0	58.0	56.0	54.0	51.0
Test Weight (kg/hl)					
Hard Red Spring or White Club	76.4	75.1	72.5	69.9	66.0
Durum	78.2	75.6	73.0	70.4	66.5
All other classes and subclasses	78.9	76.4	73.8	71.2	67.3
			Maximum percent limits:		
Defects					
Damaged kernels:					
- Heat (part of total)	0.2	0.2	0.5	1.0	3.0
- Total	2.0	4.0	7.0	10.0	15.0
Foreign material	0.4	0.7	1.3	3.0	5.0
Shrunken and broken kernels	3.0	5.0	8.0	12.0	20.0
Total 1/	3.0	5.0	8.0	12.0	20.0
Wheat of Other Classes 2/					
Contrasting classes	1.0	2.0	3.0	10.0	10.0
Total 3/	3.0	5.0	10.0	10.0	10.0
Stones	0.1	0.1	0.1	0.1	0.1
			Maximum count limits:		
Other material (1000 gram sample)					
Animal filth	1	1	1	1	1
Castor beans	1	1	1	1	1
Crotalaria seeds	2	2	2	2	2
Glass	0	0	0	0	0
Stones	3	3	3	3	3
Unknown foreign substance	3	3	3	3	3
Total 4/	4	4	4	4	4
Insect-damaged kernels in 100 grams	31	31	31	31	31

U.S. Sample grade:
Wheat that:
(a) Does not meet the requirements for U.S. Nos. 1, 2, 3, 4, 5; or
(b) Has a musty, sour or commercially objectionable foreign odor (except smut or garlic odor); or
(c) Is heating or of distinctly low quality.

1/ Includes damaged kernels (total), foreign material, and shrunken and broken kernels.
2/ Unclassed wheat of any grade may contain not more than 10.0% of wheat of other classes.
3/ Includes contrasting classes.
4/ Includes any combination of animal filth, castor beans, crotalaria seeds, glass, stones, or unknown foreign substance.

Conversion Factors

Wheat Equivalents:		**Metric Equivalents:**	
1 bushel =	60 pounds (27.2 kg)	1 pound =	0.4536 kg
36.74 bushels =	1 metric ton	1 metric ton (MT) =	2204.6 lbs
37.33 bushels =	1 long ton	1 short ton (2000 lbs) =	0.9072 MT, or 907.2 kg
33.33 bushels =	1 short ton	1 long ton (2240 lbs) =	1.0160 MT, or 1016.0 kg
3.67 bushels =	1 quintal	1 metric ton =	10 quintals
tons/ha =	0.06725 bu/acre	1 hectare =	2.47 acres
durum kg/hl =	lbs/bu x 1.292 + 0.630	1 acre =	0.40 hectare
other wheat kg/hl =	lbs/bu x 1.292 + 1.419	1 hundredweight =	100 pounds or 45.36 kg