



2010 CROP QUALITY REPORT



The world's most reliable choice.

PLANTING AND HARVEST DATES

WHEAT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
HRW Planting	■ PLANTING											
HRW Harvest	■ HARVEST											
HRS Planting												
HRS Harvest												
HW Planting												
HW Harvest												
Durum Planting												
Durum Harvest												
SW Planting												
SW Harvest												
SRW Planting												
SRW Harvest												



U.S. Wheat Associates is funded by the U.S. Department of Agriculture, Foreign Agricultural Service, and by wheat producers through the following member organizations:

Arizona Grain Research and Promotion Council

Arkansas Wheat Promotion Board

California Wheat Commission

Colorado Wheat

Administrative Committee

Idaho Wheat Commission

Kansas Wheat Commission

Maryland Grain Producers Utilization Board

Minnesota Wheat Research and Promotion Council

Montana Wheat and Barley Committee

Nebraska Wheat Board

North Dakota Wheat Commission

Ohio Small Grains Marketing Program

Oklahoma Wheat Commission

Oregon Wheat Commission

South Dakota Wheat Commission

Texas Wheat Producers Board

Virginia Small Grains Board

Washington Grain Commission

Wyoming Wheat Marketing Commission

U.S. Wheat Associates (USW) is the industry's market development organization working in 90 countries on behalf of America's wheat producers. The activities of U.S. Wheat Associates are made possible by producer checkoff dollars managed by 19 state wheat commissions and through cost-share funding provided by USDA's Foreign Agricultural Service. For more information, visit www.uswheat.org.

Nondiscrimination and Alternate Means of Communications Statement

U.S. Wheat Associates prohibits discrimination in all its programs and activities on the basis of race, color, religion, national origin, gender, marital or family status, age, disability, political beliefs or sexual orientation. Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact U.S. Wheat Associates at 202-463-0999 (TDD/TTY - 800-877-8339, or from outside the U.S.- 605-331-4923). To file a complaint of discrimination, write to Vice President of Finance, U.S. Wheat Associates, 3103 10th Street, North, Arlington, VA 22201, or call 202-463-0999. U.S. Wheat Associates is an equal opportunity provider and employer.

TABLE OF CONTENTS

Crop Quality Report Overview.	4
US Production, Supply and Demand	5
What the Tests Mean.	6
Hard Red Winter	9
Hard Red Spring	16
Hard White	23
Durum.	27
Soft White.	31
Soft Red Winter.	36
Analysis Methods.	40
Wheat Grades and Grade Requirements	42

2010 CROP QUALITY REPORT OVERVIEW



Greetings!

U.S. Wheat Associates is pleased to present this Crop Quality Report featuring data for all six classes of U.S. wheat harvested in 2010.

The wheat growers we represent have produced another abundant, high-quality crop. That is fortunate given the swift supply shock sparked by the drought and government intervention in Russia a few months ago, and it proves once again that U.S. wheat is the world's most reliable choice.

We also strive for transparency, symbolized in part by this Crop Quality Report. Wheat producers and the U.S. government provide the money used to test, analyze and publish the complete picture of each year's crop. You can be confident in the data and our professional staff will help you take advantage of any opportunities or manage any issues that emerge.

The price of U.S. wheat is also available to all buyers at all times, and a weekly summary is available on our website at www.uswheat.org. Today, the unprecedented increases that followed the events in the Black Sea region have eased. That is why we can say with confidence that when you consider both price and the new crop's potential revealed in this data, the landed-cost value of U.S. wheat remains high. We will be pleased to work with you to capture that value for your company.

We look forward to sharing this information with the world's wheat buyers, millers, bakers, and food processors. On behalf of our producers, our 19 state wheat commission members, and the U.S. Department of Agriculture's Foreign Agricultural Service, thank you for choosing U.S. wheat.

Sincerely,

Alan Tracy, President
U.S. Wheat Associates

SUMMARY OF CLASSES

	Hard Red Winter		Hard Red Spring		Durum*		Soft White		Soft Red Winter	
	2010	5-Year Avg	2010	5-Year Avg	2010	5-Year Avg	2010	5-Year Avg	2010	5-Year Avg
Test Weight (lb/bu)	61.0	60.2	61.6	60.8	60.0	60.4	59.6	59.8	57.9	59.4
(kg/hl)	80.2	79.2	81.0	80.0	78.1	78.7	78.5	78.7	76.2	78.1
Grade	1 HRW	1 HRW	1 NS	1 NS	1 HAD	1 HAD	2 SW	2 SW	3 SRW	2 SRW
Dockage (%)	0.6	0.6	0.7	0.7	0.9	1.6	0.7	0.7	0.9	0.9
Wheat Moisture (%)	11.2	11.2	12.4	12.1	11.5	11.8	9.4	9.2	12.9	13.0
Wheat Protein (%) **	11.8	12.4	13.7	14.3	13.4	14.4	9.7	10.4	10.3	9.9
Wheat Ash (%) **	1.55	1.55	1.57	1.60	1.56	1.56	1.38	1.39	1.55	1.53
1000 Kernel Weight (g)	29.4	29.4	32.4	31.1	40.3	36.0	34.4	33.8	31.8	33.4
Wheat Falling Number (sec)	406	412	387	405	335	370	337	332	333	334
Flour/Semolina Extraction (%)	70.9	70.0	70.0	68.9	66.3	64.4	71.0	69.6	70.0	69.0
Flour/Semolina Ash (%) **	0.42	0.51	0.53	0.50	0.67	0.69	0.51	0.42	0.43	0.43
Wet Gluten (%)	27.2	30.1	33.8	35.8	35.3	37.6	21.7	23.0	23.3	21.8
Farinograph:										
Peak Time (min)	4.3	5.7	5.7	8.5	n/a	n/a	1.5	1.7	1.6	1.5
Stability (min)	12.0	10.7	9.9	16.0	n/a	n/a	3.7	4.3	2.9	2.9
Absorption (%)	56.3	58.3	65.0	66.1	n/a	n/a	52.5	53.6	51.8	52.0
Alveograph W (10 ⁻⁴ joules)	232	257	395	416	105	100	106	115	83	94
Loaf Volume (cc)	813	836	947	992	n/a	n/a	n/a	n/a	733	716
Production (mmt)	27.7	24.6	15.8	13.1	3.0	2.4	6.9	6.1	6.5	11.3

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

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

US Production by Class

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

	2010	2009	2008	2007	2006
Hard Red Winter	27.7	25.0	28.2	26.0	18.6
Hard Red Spring	15.8	14.9	13.9	12.2	11.8
Hard White	0.6	0.7	0.8	0.7	0.5
Durum	3.0	3.0	2.3	2.0	1.5
Soft White	6.9	5.7	6.1	5.3	6.4
Soft Red Winter	6.5	11.0	16.7	9.6	10.6
Total	60.5	60.4	68.0	55.8	49.3

Based on USDA crop estimates of September 30, 2010

US Supply and Demand

Estimated for 2010/2011 (year beginning June 1)
(million metric tons)

	HRW	HRS	Durum	White	SRW	TOTAL
Supply:						
Beginning Stocks	10.5	6.4	1.0	2.2	6.6	26.6
Production	27.7	15.8	3.0	7.5	6.5	60.5
Total Supply	38.2	23.1	4.9	9.9	13.6	89.8
Demand:						
Domestic Use	13.4	7.3	2.4	2.9	6.6	32.5
Exports	15.6	9.5	1.5	4.6	2.7	34.0
Total Demand	29.0	16.8	3.9	7.5	9.3	66.6
Ending Stocks	9.2	6.3	1.0	2.4	4.3	23.2
Stocks Five-year Average	6.3	3.8	0.7	1.6	3.7	16.1

Based on USDA Supply/Demand estimates of October 8, 2010.



WHAT THE TESTS MEAN

Wheat Grades reflect the physical quality and condition of a sample and thus may indicate the general suitability of a sample for milling. The U.S. grade of a sample is determined by measurement of such factors as test weight, damaged kernels, foreign material, shrunken and broken kernels, and wheat of contrasting classes. All numeric factors other than test weight are reported as a percentage by weight of the sample. Grade determining factors include:

- **Test Weight** is a measure of the density of the sample and may be an indicator of milling yield and the general condition of the sample, as problems that occur during the growing season or at harvest often reduce test weight.
- **Damaged Kernels** are kernels which may be undesirable for milling because of disease, insect activity, frost or sprout damage, etc.
- **Foreign Material** is any material other than wheat that remains after dockage is removed. Because foreign material may not be removed by normal cleaning equipment, it may have an adverse effect on milling quality.
- **Shrunken and Broken Kernels** are kernels which either were insufficiently filled during growing and have a shrunken or shriveled appearance or have been broken in handling. Such kernels may reduce milling yield.
- **Total Defects** is the sum of damaged kernels, foreign material and shrunken and broken kernels.
- **Vitreous Kernels** in hard red spring wheat are kernels which are uniformly dark and have no spots which appear chalky or soft. In durum, vitreous kernels have a glassy and translucent appearance without any spots that appear chalky.

Dockage is the percentage by weight of any material easily removed from a wheat sample using the Carter Dockage Tester. Dockage, because it can be easily removed, should not have any effect on milling quality but may have other economic effects for buyers. Grade factors are determined only after dockage is removed.

Moisture content is the percentage moisture by weight of a sample and is an important indicator of profitability in milling. Flour millers add water to adjust wheat moisture to a standard level before milling. Lower wheat moisture allows more water to be added, increasing the weight of grain to be milled at virtually no cost. Moisture content is also an indicator of grain storability as wheat and flour with low moisture are more stable during storage. Because moisture can be readily added to or physically removed from a sample, other analysis results are often mathematically converted to a standard moisture basis, such as 14%, 12% or dry matter, so results can be meaningfully compared.

Protein content is the percentage protein by weight in a sample. Protein can be quickly and easily measured and therefore is an important factor in determining the value of wheat since it relates to many processing properties, such as water absorption and gluten strength. Low protein is desired for products such as snacks or cakes. High protein is desired for products such as pan breads, buns and frozen yeast-raised products.

Ash content is the percentage of minerals by weight in wheat or flour. In wheat, ash is primarily concentrated in the bran and is an indication of the flour yield that can be expected during milling. In flour, ash content indicates milling performance by indirectly revealing the amount of bran contamination in flour. Ash in flour can impart a darker color to finished products. Products requiring particularly white flour call for low ash content while whole wheat flour has higher ash content.

1000 Kernel Weight is the weight in grams of one thousand kernels of wheat and may indicate grain size and expected milling yield.

Kernel Size is a measure of the percentage by weight of large, medium and small kernels in a sample. Large kernels or more uniform kernel size may help improve milling yield.

Single Kernel Characterization System (SKCS) measures 300 individual kernels from a sample for size (diameter), weight, hardness (based on the force needed to crush) and moisture. Detailed SKCS results (not reported in this booklet) include the distribution of these factors, which may be an indicator of the uniformity of the sample and may help millers experienced with the system optimize flour milling yields. Kernel characteristics are related to milling properties such as tempering, roll gap settings, and flour starch damage content.

Sedimentation value is a measure of the sediment that results when lactic acid is added to a sifted ground wheat sample and can be used as an indicator of gluten quality and thus the baking quality of wheat flour.

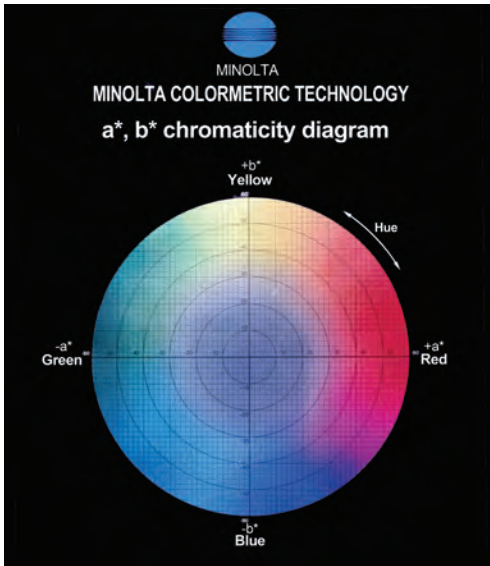
Falling Number indirectly indicates alpha-amylase activity, which results from sprout damage. High Falling Number values indicate low alpha-amylase activity. Sufficient alpha-amylase activity is required in flour for some products such as yeast-raised bread. However, excessive alpha-amylase in wheat cannot be removed and is difficult to blend to lower alpha-amylase content, and the resulting flour produces a sticky dough that can cause problems during processing and products with poor color and weak texture. Falling Number usually correlates closely with amylograph.

Extraction is the percentage by weight of flour obtained from a wheat sample. In a commercial flour mill the extraction rate is critically important to mill profitability. In a laboratory,

WHAT THE TESTS MEAN

milling with the Buhler Laboratory Mill is mainly done to obtain flour for other tests. **The Buhler Laboratory Mill extraction rate is always significantly lower than the rate that can be obtained on a commercial mill, but may be useful for comparison between crop years.**

Color is a numerical system to measure a sample's lightness (L^*) on a scale of 0 to 100 and "chromaticity" or hue on two scales each running from -60 to +60 for green-red (a^*) and blue-yellow (b^*). High L^* values indicate a bright color, and higher b^* values indicate more yellow. Flour color is influenced by the wheat's endosperm color and the ash content of the flour and often affects the color of the finished product.



Wet Gluten is a measure of the quantity of gluten in wheat or flour

samples as determined using the Glutomatic system. Gluten forms when water is added to the protein in wheat and is responsible for the elasticity and extensibility characteristics of flour dough.

Gluten Index is also determined by the Glutomatic system and is a measure of gluten strength regardless of the quantity of gluten present. Gluten index is used commercially to select durum samples with strong gluten characteristics. In bread wheat a variety of factors other than gluten quality can affect the results though very low gluten index may be an indication of protein damage from insect or disease activity.

Amylograph measures flour starch pasting properties that are important to some end products such as sheeted Asian noodles. Amylograph also measures enzyme (alpha-amylase) activity which results from sprout damage. Amylograph results usually correlate very closely with Falling Number results.

Starch Damage, the percentage by weight of damaged starch in a flour sample, is a measure of the physical damage done to starch granules during milling. Bread (hard) wheat flour typically has higher starch damage than soft wheat flour. Highly damaged starch readily absorbs more water which affects dough mixing and other processing properties. Because starch damage depends on how the sample was

milled, starch damage is important for interpreting other results reported.

Farinograph generates a curve that indicates the power being used over time as flour and water are mixed into dough. The results describe the mixing properties of the dough and include:

- **Peak Time** is the time interval from the first addition of water to the maximum consistency immediately prior to the first indication of weakening. Long peak times indicate strong gluten and dough properties while short peak times may indicate weak gluten.
- **Stability** is the interval between the point where the top of the curve first intersects the 500-BU line (called the "arrival time") and the point where the top of the curve departs the 500-BU line ("departure time"). Long stability times also indicate strong gluten and dough properties, useful in such products as yeast-raised breads while short stability times indicate weaker gluten useful in many confectionary products.
- **Absorption** is the amount of water (as a percent by weight of 14 percent moisture wheat flour) required to center the curve peak on the 500-BU line. High water absorption provides economic advantages for producing more dough pieces than flour with lower water absorption.
- **Classification** rates the curves produced by the farinograph ("farinograms") on a scale of 1 to 8, with higher values indicating stronger gluten and dough mixing properties for hard red spring wheat flour.



FARINOGRAPH

WHAT THE TESTS MEAN

Alveograph generates a curve indicating the air pressure necessary to inflate a piece of dough like a bubble to the point of rupture and indicates the gluten strength and extensibility of dough. Values reported include:

- **P** (“overpressure”), measured in millimeters to the maximum height of the curve, reflects the maximum pressure while blowing the bubble of dough and indicates dough resistance to extension.
- **L** (length), the length of the curve measured in millimeters, reflects the size of the bubble and indicates dough extensibility.
- **W** (the area under the curve) reflects the amount of energy needed to inflate the dough to the point of rupture and indicates dough strength.

The alveograph is well suited for measuring the dough characteristics of weaker gluten wheat. Flour with low P value (indicating weak gluten) and long L value (high extensibility) is preferred for cakes and confectionery products. Flour with high P values (strong gluten) is preferred for breads.

Extensograph generates a force-time curve for a piece of dough stretched until it breaks. Results include:

- **Resistance**, measured at the maximum curve height in Brabender units (B.U.), reflects the maximum force applied and indicates the resistance of the dough to extension.
- **Extensibility**, measured as the total length of the curve at the base line in centimeters, reflects how far the dough was stretched.

- **Area** is the area under the curve reported in square centimeters.

These factors help describe the gluten strength and dough extensibility characteristics of flour for a wide range of end products. The extensograph can also evaluate the effects of fermentation time and additives on dough performance.

Mixograph, similar to the farinograph but quicker and using a smaller amount of flour sample, generates a graph that records the force needed to mix flour or semolina and water into dough. The graph is classified on a scale of 1 to 8, with higher values indicating stronger gluten characteristics for durum milled fractions.

Solvent Retention Capacity (or SRC) is the weight of solvent held by flour after centrifugation, and expressed as a percent of the flour weight on a 14 percent moisture basis. The different solvents used relate flour functionality to specific flour components and thus can be useful for predicting commercial baking performance, especially for soft wheat flours.

Baking Absorption is the water required for optimum dough mixing performance, expressed as a percent of flour weight on a 14 percent moisture basis.

Crumb Grain and Texture is determined on a scale of 1 to 10 by visual comparison to a standard using a constant illumination source. Higher scores are preferred.

Loaf Volume is the volume of the test loaf after baking. Higher loaf volumes indicate better baking performance for pan breads.

Specks are visually counted in a semolina sample and reported as the number in 10 square inches. Specks, which can detract from pasta appearance and desirability, are small particles of bran or other material that escaped the wheat cleaning and semolina purifying process and thus depend on the milling process as well as the characteristics of the durum.

Sugar Snap Cookie, Sponge Cake, Chinese Southern-Type Steamed Bread, Spaghetti, and the Hard White noodle and steamed bread tests all use standardized methods to prepare specific end products to evaluate the suitability of the sample for that product or similar products. Details on many of these tests can be found in the Analysis Methods.



ALVEOGRAPH

Photos courtesy of Wheat Marketing Center

MIDWESTERN HARVEST SURVEY

Weather and Harvest: The 2010 hard red winter (HRW) wheat crop began with generally favorable planting conditions in all regions, particularly in the southern plains (Texas and Oklahoma). Emergence ratings were very close to the five-year average throughout the fall of 2009, and the crop was in good condition going into the winter months. By early April, fair to excellent crop condition ratings of over 90% were widespread, favorable conditions which continued right through to harvest. Cool temperatures with good moisture tended to be a hindrance, however, to crop maturity. The start of harvest was 2 to 3 weeks behind normal in northeast Colorado, the Nebraska Panhandle and Montana. While the cool, damp weather during grainfill was a major contributor to higher than normal test weights, kernel size and mill yield, those same conditions were not conducive to accumulation of protein, which is below the five-year average.

Survey Methods: Sample collection and analysis were conducted by the USDA ARS Hard Red Winter Wheat Quality Lab, Manhattan, Kansas, and Plains Grains, Inc. A total of 468 samples were collected from grain elevators when the local harvest was at least 30% complete in Texas, Oklahoma, Colorado, Kansas, Nebraska, South Dakota, Wyoming and Montana. The area sampled represents about 80% of HRW production. Official grade and non-grade factors were determined on each sample. Milling, dough functionality and bake tests were run on 112 composites based on 41 production areas and three protein ranges of <11.5%, 11.5% - 12.5%, and >12.5%. Results were then mathematically aggregated to represent Gulf-tributary, PNW-tributary, and overall results. The analytical methods used are described in the Analysis Methods section of this booklet.

Wheat and Grade Data: Seventy-one percent of all individual samples graded US #1 and 92% graded US #2 or better. Average dockage of 0.6%, damaged kernels and shrunken and broken kernels are all equal to the five-year averages while foreign material and total defects increased slightly over the five-year average. Kernel characteristics, including test weight, thousand kernel weight and kernel diameter, are very good, consistent with favorable growing conditions. Average test weight of 61.0 lbs/bu. (80.2 kg/hl) is above the five-year and 2009 averages. Average thousand kernel weight of 29.4 g is about equal to the five-year average, but slightly lower than 2009. Kernel diameter of 2.61 mm is above the five-year average, but slightly below 2009.

However, growing conditions favoring kernel size and test weight are not conducive to accumulating wheat protein, which is over a half a point below the five-year average and similar to 2009. The distribution of protein differs by area with nearly half the Gulf tributary samples in the 11.5% - 12.5% category while nearly 60% of PNW tributary samples are in the < 11.5% protein category. Average falling number is 406 seconds, indicative of sound wheat.

Flour and Baking Data: The Buhler laboratory mill flour yield reflects outstanding kernel characteristics with an overall average of 70.9%, similar to 2009 and well above the five-year average of 70.0%. The Gulf average of 70.5% is higher than the five-year average of 70.0%; the PNW average of 71.9% is slightly below 2009, but well above the five-year average 70.1%. Flour ash and flour color results support proper setting of the mill. Flour protein averages 10.1%, a full percentage point below the five-year average and reflecting a slightly elevated loss in the milling process. Gulf flour protein is 10.2%, down one-half point from 2009 and eight tenths of a point lower than the five-year average. PNW flour protein is 9.9% a half point lower than 2009 (10.4%) and over 1 point lower than the five-year average of 11.1%. Farinograph absorption (56.3%) is significantly below 2009 and 2 points below the five-year average of 58.3%. Farinograph stability (12.0 minutes) is above the five-year average of 10.7 minutes, but below 2009. The average W value of 232 is similar to the 2009 value and below the five-year average of 257. Loaf volume averages just over 800 cc, comparable to the 2009 crop but significantly below the five-year average of 836 cc.

Summary: The 2010 HRW crop can be characterized as clean and sound with very good milling properties, but with below average protein content and with end-product qualities consistent with the lower protein values.

CALIFORNIA HARVEST SURVEY

California's wheat growing regions are defined by climate, value of alternative crops, and distinct differences in variety selection. California experienced another cool growing season this year. This resulted in very high yields and variable proteins. Disease pressure was low.

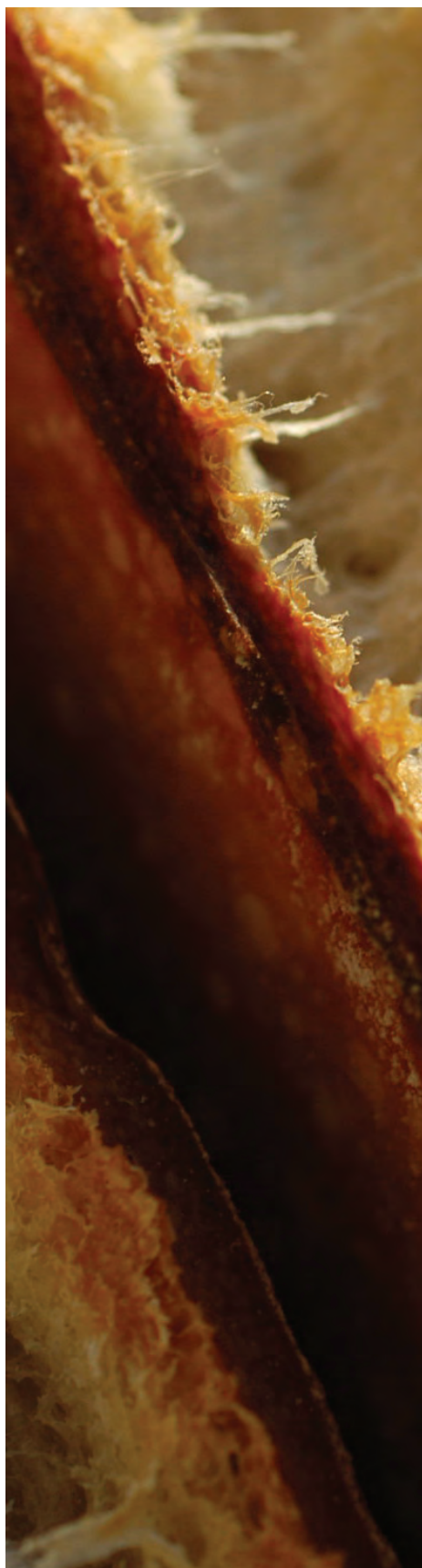
HRW acreage increased over 15% in the state this year. California red wheats are harvested in the months of June and July. With strong domestic demand for new crop wheat, export buyers are encouraged to express their interest in purchasing California wheat in early spring.

EXPORT CARGO SURVEY

The export cargo data represent 503 individual subplot samples provided by USDA's Federal Grain Inspection Service for marketing years 2010 and 2009. Of 125 2010-crop samples collected in August and September, 90 are from Gulf and 35 from PNW ports. Of the 378 2009-crop samples, 263 are from Gulf and 115 from PNW ports. Grade data are the official grades on the individual sublots. Milling and baking analyses were conducted by CII Laboratory Services, Kansas City, MO.



HARD RED WINTER | MIDWESTERN HARVEST DATA



Hard Red Winter	Composite Average					
	2010 By Protein*				2009 Overall	5-Year Average
	Low	Med	High	Overall		
Wheat Grade Data:						
Test Weight (lb/bu)	61.7	60.8	60.3	61.0	60.6	60.2
(kg/hl)	81.2	79.9	79.3	80.2	79.7	79.2
Damaged Kernels (%)	0.2	0.4	0.4	0.3	0.2	0.3
Foreign Material (%)	0.1	0.2	0.3	0.2	0.1	0.1
Shrunken & Broken (%)	1.0	1.2	1.1	1.1	1.0	1.2
Total Defects (%)	1.4	1.7	1.8	1.6	1.3	1.5
Grade	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW
Wheat Non-Grade Data:						
Dockage (%)	0.6	0.6	0.6	0.6	0.5	0.6
Moisture (%)	11.1	11.2	11.2	11.2	11.3	11.2
Protein (%) 12%/0% moisture basis	11.0/12.5	12.0/13.6	12.9/14.7	11.8/13.4	12.1/13.8	12.4/14.1
Ash (%) 14%/0% moisture basis	1.52/1.77	1.56/1.81	1.61/1.87	1.55/1.80	1.55/1.80	1.55/1.80
1000 Kernel Weight (g)	29.6	29.0	28.8	29.4	30.1	29.4
Kernel Size (%) lg/md/sm	62/36/2	60/39/1	59/39/2	62/37/1	63/36/1	57/41/1
Single Kernel: Hardness	70.1	69.8	69.1	69.7	70.6	68.8
Weight (mg)	29.6	29.0	28.8	29.4	30.1	29.5
Diameter (mm)	2.60	2.59	2.59	2.61	2.64	2.32
Sedimentation (cc)	49.2	54.9	58.9	54.0	56.8	46.8
Falling Number (sec)	397	406	418	406	410	412
Flour Data:						
Lab Mill Extraction (%)	71.1	71.1	70.8	70.9	70.7	70.0
Color: L*	92.7	92.6	92.4	92.6	92.7	91.9
a*	-1.9	-1.8	-1.7	-1.8	-1.7	-2.2
b*	10.5	10.5	10.5	10.4	9.9	9.8
Protein (%) 14%/0% moisture basis	9.4/10.9	10.3/12.0	11.2/13.0	10.1/11.7	10.6/12.3	11.1/12.9
Ash (%) 14%/0% moisture basis	0.40/0.47	0.41/0.49	0.43/0.51	0.42/0.49	0.46/0.53	0.51/0.59
Wet Gluten (%)	24.9	27.8	30.8	27.2	28.4	30.1
Gluten Index	97.8	97.7	95.0	97.7	96.9	94.6
Falling Number (sec)	N/A	N/A	N/A	N/A	N/A	412
Amylograph Viscosity 65 g (BU)	673	695	727	695	>1000	905
Starch Damage (%)	6.0	5.8	5.6	5.8	6.0	6.8
Dough Properties:						
Farinograph:						
Peak Time (min)	3.3	4.8	5.4	4.3	5.4	5.7
Stability (min)	11.1	12.7	13.6	12.0	13.1	10.7
Absorption (%)	56.0	56.4	57.2	56.3	57.2	58.3
Alveograph: P (mm)	76	74	72	75	68	78
L (mm)	81	88	87	85	101	102
P/L Ratio	0.96	0.86	0.86	0.90	0.69	0.76
W (10 ⁻⁴ joules)	220	234	226	232	239	257
Extensograph: Resistance (BU)	342/592	343/557	334/524	343/561	329/512	323/456
(45/135 min) Extensibility (cm)	14.2/12.8	14.9/13.9	15.5/14.9	14.7/13.7	15.4/14.5	15.1/14.5
Area (sq cm)	85/119	93/131	96/141	91/131	94/132	88/116
Baking Evaluation:						
Crumb Grain (scale 1-10)	5.6	5.6	5.7	5.8	5.9	6.1
Crumb Texture (scale 1-10)	6.5	6.6	7.0	6.7	6.7	6.8
Loaf Volume (cc)	775	829	875	813	813	836
% of Area Production:	33	44	23	100	100	

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

Gulf Exportable Average						PNW Exportable Average					
2010 By Protein*				2009 Overall	5-Year Average	2010 By Protein*				2009 Overall	5-Year Average
Low	Med	High	Overall			Low	Med	High	Overall		
61.7	60.9	60.6	61.0	60.2	60.0	61.7	60.2	59.0	61.1	61.6	61.1
81.2	80.1	79.8	80.2	79.2	78.9	81.2	79.2	77.7	80.3	81.0	80.3
0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.6	0.9	0.4	0.1	0.1
0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.0	0.1
1.0	1.2	1.1	1.1	1.0	1.2	1.0	1.0	1.2	1.1	0.9	1.3
1.4	1.7	1.7	1.6	1.3	1.6	1.3	1.7	2.3	1.6	1.0	1.4
1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	2 HRW	1 HRW	1 HRW	1 HRW
0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.4	0.6
11.1	11.1	11.1	11.1	11.3	11.3	11.2	11.5	11.4	11.3	11.5	10.7
11.1/12.6	12.0/13.6	12.9/14.7	11.9/13.5	12.2/13.8	12.4/14.1	10.8/12.2	12.1/13.8	12.8/14.6	11.4/12.9	11.9/13.5	12.2/13.9
1.56/1.81	1.57/1.82	1.57/1.82	1.57/1.82	1.59/1.85	1.56/1.82	1.40/1.63	1.54/1.79	1.61/1.87	1.48/1.72	1.49/1.73	1.50/1.75
29.4	28.8	28.1	29.2	30.1	29.4	30.2	29.7	31.1	30.1	32.1	29.5
62/37/1	60/38/2	61/38/1	60/38/2	63/36/2	58/40/2	64/35/1	57/42/1	66/33/1	63/36/1	69/31/1	54/44/1
70.5	71.2	73.3	70.8	70.1	68.4	69.0	65.1	54.5	65.9	67.7	69.7
29.4	28.8	28.1	29.2	30.1	29.5	30.2	29.7	31.1	30.1	32.1	29.7
2.60	2.59	2.57	2.61	2.64	2.33	2.59	2.59	2.65	2.60	2.69	2.30
48.0	53.1	58.3	52.1	55.6	46.6	53.3	61.1	60.8	56.1	58.5	46.9
404	410	423	404	411	423	370	392	404	382	402	418
71.0	70.7	70.1	70.5	70.3	70.0	71.5	72.6	73.3	71.9	72.2	70.1
92.7	92.5	92.3	92.5	92.6	91.9	92.6	92.9	92.6	92.8	92.8	92.2
-1.9	-1.8	-1.7	-1.8	-1.7	-2.1	-1.9	-1.9	-1.7	-1.9	-1.6	-2.2
10.6	10.6	10.7	10.6	9.9	9.7	10.3	10.2	9.7	10.2	9.7	9.7
9.4/10.9	10.3/12.0	11.2/13.0	10.2/11.8	10.7/12.4	11.0/12.8	9.2/10.7	10.6/12.3	11.1/12.9	9.9/11.5	10.4/12.1	11.1/12.8
0.41/0.48	0.42/0.49	0.44/0.51	0.42/0.49	0.47/0.54	0.51/0.59	0.39/0.45	0.40/0.47	0.42/0.49	0.40/0.47	0.43/0.50	0.49/0.57
25.2	27.7	30.9	27.5	28.4	30.1	23.9	28.1	30.5	26.1	28.3	30.1
97.6	97.4	94.0	97.4	96.9	94.5	98.6	98.7	98.3	98.6	97.4	95.1
404	410	423	404	N/A	423	370	392	404	382	N/A	418
704	715	757	726	>1000	905	567	624	624	586	>1000	907
5.9	5.8	5.7	5.7	5.9	6.9	6.3	5.7	5.2	5.9	5.9	6.6
3.5	4.7	5.6	4.7	5.5	5.6	2.4	5.1	5.0	3.0	5.1	5.8
11.0	11.9	14.2	12.0	13.3	10.6	11.4	15.6	11.7	11.8	12.2	11.1
56.0	56.5	57.7	56.4	57.1	58.2	56.0	56.2	55.2	56.0	57.2	58.4
74	75	76	75	67	76	82	69	58	75	70	81
82	86	82	84	101	103	76	95	101	90	98	97
0.92	0.88	0.93	0.91	0.67	0.74	1.09	0.76	0.60	0.86	0.74	0.84
215	232	229	229	231	254	234	240	216	244	243	259
331/581	338/555	325/514	337/554	326/513	402/513	383/632	363/562	362/559	362/585	338/500	436/535
14.2/13.0	14.9/13.8	15.4/14.7	14.7/13.7	15.6/14.6	16.3/16.2	13.9/12.2	15.2/14.2	15.7/15.7	14.8/13.5	15.3/14.5	17.1/16.0
83/120	90/129	92/134	90/130	95/134	99/125	91/116	104/138	109/163	97/133	96/128	112/125
5.5	5.7	5.9	6.0	6.0	6.2	6.0	5.1	5.1	5.2	5.6	6.0
6.4	6.7	7.0	6.8	6.6	6.9	6.9	6.5	7.0	6.6	6.8	6.9
779	826	883	817	815	836	762	838	851	801	795	834
29	47	24	100	100		57	29	14	100	100	

HARD RED WINTER | CALIFORNIA AND EXPORT DATA

Hard Red Winter	California Harvest Data				Export Cargo Data			
	Medium Protein Average		High Protein Average		Gulf		PNW	
	2010	2009	2010	2009	2010	2009	2010	2009
Wheat Grade Data:								
Test Weight (lb/bu)	63.7	62.8	63.5	62.2	61.4	60.6	62.1	62.0
(kg/hl)	83.7	82.5	83.4	81.8	80.7	79.7	81.7	81.5
Damaged Kernels (%)	0.0	0.2	0.3	0.0	1.0	1.3	0.2	0.2
Foreign Material (%)	0.3	0.1	0.2	0.1	0.2	0.3	0.1	0.1
Shrunken & Broken (%)	0.4	0.5	0.5	0.6	1.4	1.4	1.2	1.3
Total Defects (%)	0.7	0.8	0.9	0.7	2.6	3.0	1.6	1.6
Grade	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW
Wheat Non-Grade Data:								
Dockage (%)	1.0	0.8	0.9	0.8	0.6	0.7	0.3	0.3
Moisture (%)	8.6	8.6	8.4	8.8	11.3	11.3	11.3	10.8
Protein (%) 12%/0% moisture basis	11.7/13.3	11.8/13.5	13.5/15.3	13.1/14.9	11.7/13.3	11.8/13.4	11.6/13.2	11.9/13.5
Ash (%) 14%/0% moisture basis	1.39/1.61	1.44/1.67	1.45/1.69	1.50/1.75	1.50/1.74	1.56/1.81	1.38/1.60	1.39/1.62
1000 Kernel Weight (g)	47.5	40.8	46.7	40.1	28.3	28.1	29.2	29.3
Kernel Size (%) lg/md/sm					66/32/2	68/31/2	65/34/1	65/33/1
Single Kernel: Hardness						68.9		73.2
Weight (mg)						29.5		30.2
Diameter (mm)						2.36		2.35
Sedimentation (cc)					28.1	27.5	35.2	36.7
Falling Number (sec)					409	422	377	386
Flour Data:								
Lab Mill Extraction (%)	71.8	73.2	72.7	73.2	70.7	70.1	70.9	70.9
Color: L*					92.2	92.7	92.3	92.9
a*					-3.0	-3.2	-3.0	-3.2
b*					8.6	8.2	8.4	8.1
Protein (%) 14%/0% moisture basis	11.0/12.8	10.3/12.0	12.2/14.2	11.5/13.4	10.4/12.0	10.4/12.1	10.4/12.1	10.6/12.4
Ash (%) 14%/0% moisture basis	0.41/0.47	0.43/0.51	0.41/0.48	0.44/0.51	0.51/0.59	0.51/0.59	0.50/0.58	0.49/0.57
Wet Gluten (%)	29.2	27.8	34.2	31.5	26.7	27.9	27.6	28.6
Gluten Index					98.4	96.9	98.4	97.2
Falling Number (sec)	409	444	417	445	449	473	432	434
Amylograph Viscosity 65 g (BU)					742	722	689	632
Starch Damage (%)								
Dough Properties:								
Farinograph:								
Peak Time (min)	6.8	5.9	9.4	6.4	5.8	5.9	6.5	6.2
Stability (min)	14.3	15.6	15.4	15.9	10.4	12.1	11.4	12.3
Absorption (%)	63.7	61.2	64.8	61.3	58.1	58.9	58.7	60.3
Alveograph: P (mm)								
L (mm)					87	115	91	125
P/L Ratio					78	73	83	74
W (10 ⁻⁴ joules)					1.10	1.59	1.10	1.69
					227	299	260	328
Extensograph: Resistance (BU)								
(45/135 min) Extensibility (cm)								
Area (sq cm)								
Baking Evaluation:								
Crumb Grain (scale 1-10)					6.0	6.1	6.3	6.3
Crumb Texture (scale 1-10)					6.4	6.5	6.8	6.7
Loaf Volume (cc)	874	859	959	922	785	792	790	775
Number of Samples					90	263	35	115

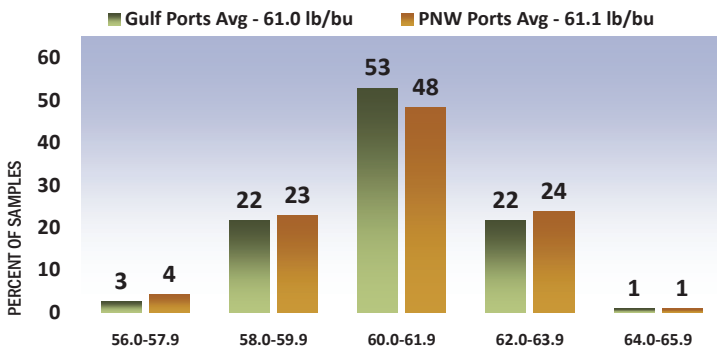
NINE STATES SURVEYED

California • Colorado • Kansas
Montana • Nebraska • Oklahoma
South Dakota • Texas • Wyoming



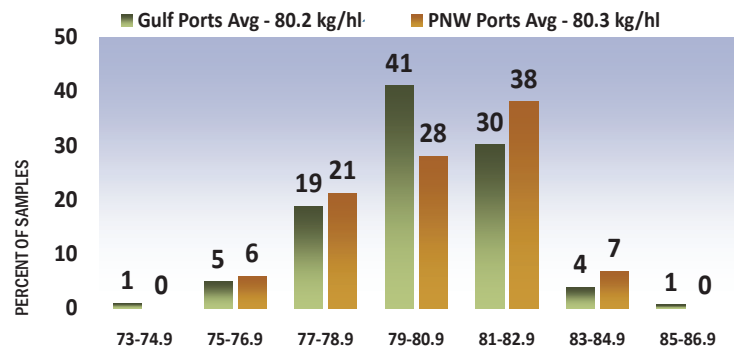
TEST WEIGHT

Pounds/Bushel



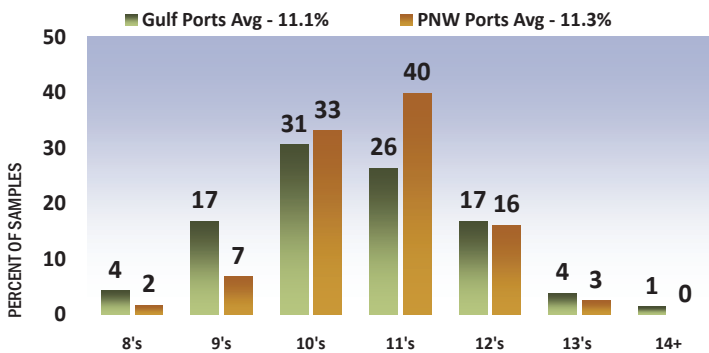
HECTOLITER WEIGHT

Kilograms/Hectoliter



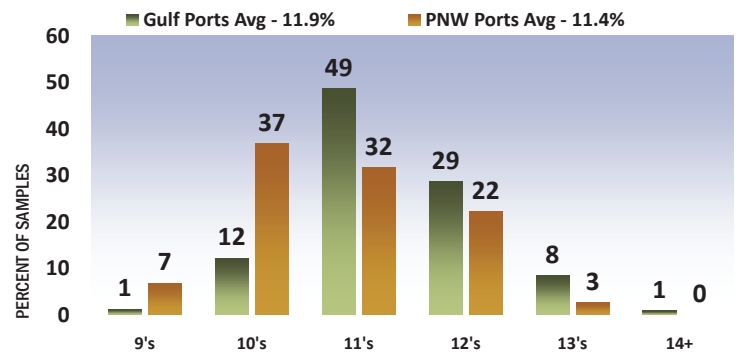
WHEAT MOISTURE

Percent



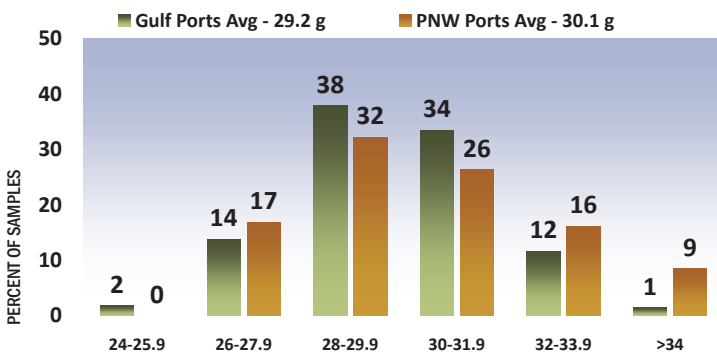
PROTEIN (12% MB)

Percent



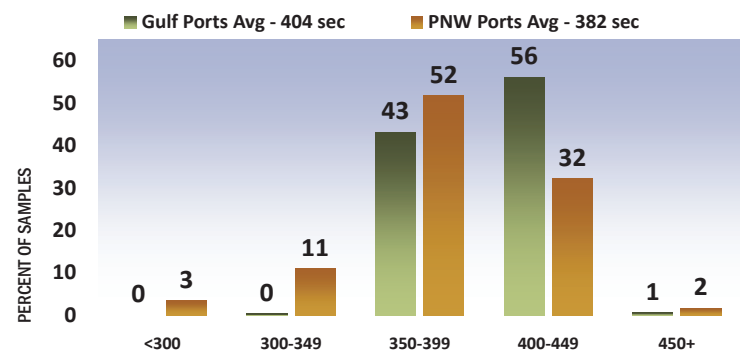
1000 KERNEL WEIGHT

Grams



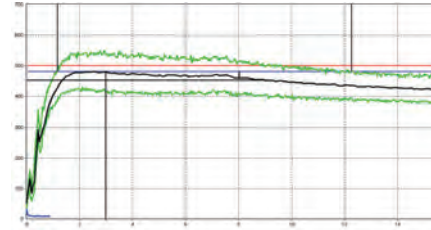
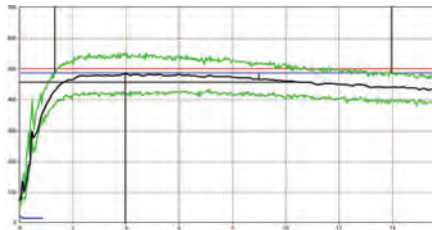
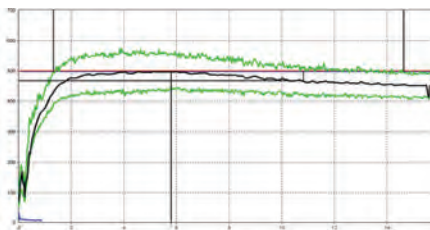
FALLING NUMBER

Seconds

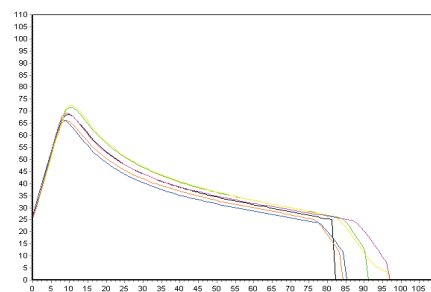
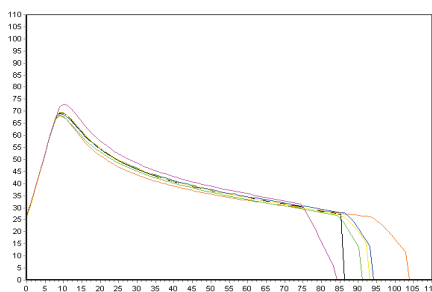
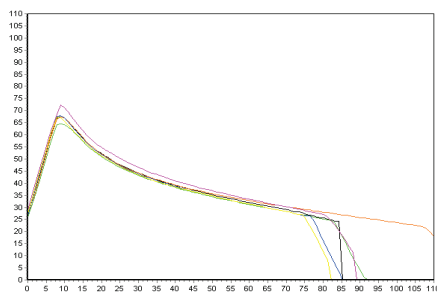


HARD RED WINTER | PHYSICAL DOUGH PROPERTIES

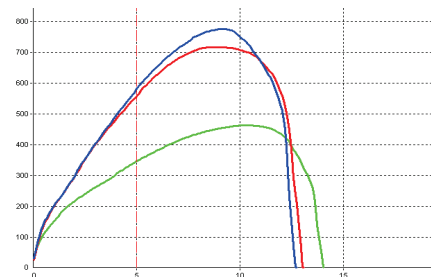
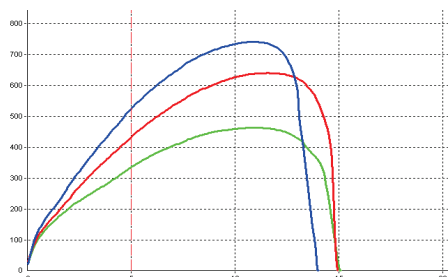
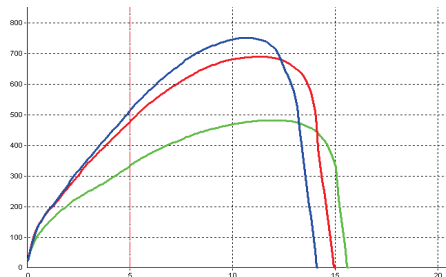
FARINOGRAMS*



ALVEOGRAMS



EXTENSOGRAMS



HIGH PROTEIN

MEDIUM PROTEIN

LOW PROTEIN

*Representing 2010 Composite Average



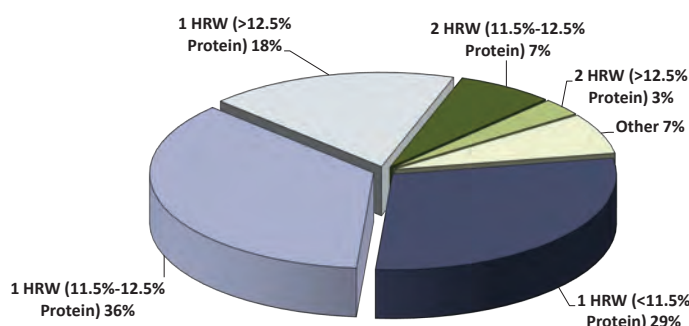
Hard Red Winter Production

for the major growing region (million metric tons)

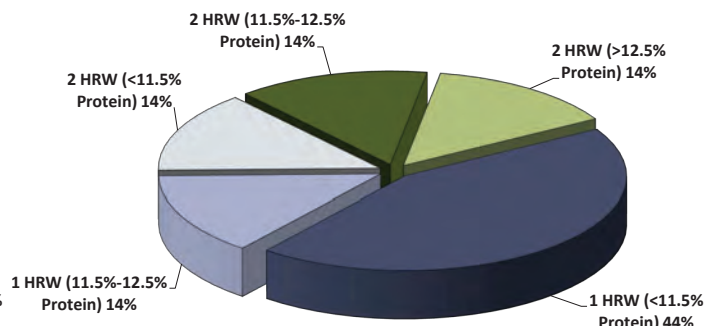
	2010	2009	2008	2007	2006
California	0.7	0.6	0.8	0.5	0.3
Colorado	2.8	2.5	1.4	2.3	1.0
Kansas	9.6	9.9	9.4	7.5	7.8
Montana	2.5	2.4	2.5	2.2	2.2
Nebraska	1.7	2.1	2.0	2.3	1.6
Oklahoma	3.3	2.1	4.4	2.6	2.2
South Dakota	1.7	1.7	2.8	2.5	1.1
Texas	3.4	1.6	2.6	3.7	0.9
Wyoming	0.1	0.1	0.1	0.1	0.1
Nine-State Total	25.8	22.9	26.0	23.6	17.2
Total HRW Production	27.7	25.0	28.2	26.0	18.6

Based on USDA crop estimates of September 30, 2010.

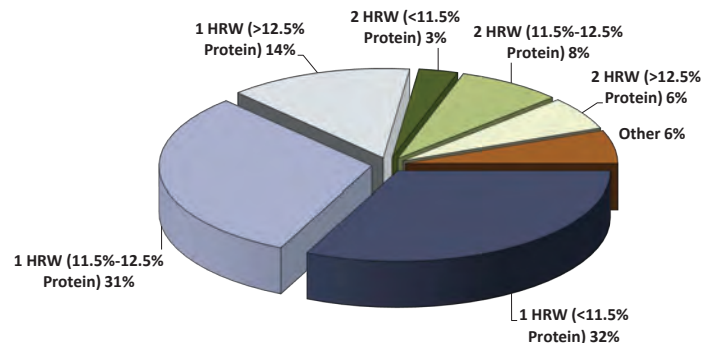
GULF EXPORTABLE



PNW EXPORTABLE



OVERALL



ABOUT HARD RED WINTER WHEAT

U.S. hard red winter wheat has medium to high protein, medium hard endosperm, red bran, medium gluten content and mellow gluten. Used in pan breads, Asian noodles, hearth breads, hard rolls, flatbreads, croissants and general-purpose flour.

HARVEST SURVEY

Weather and Harvest: Planting of the 2010 hard red spring wheat (HRS) crop began in mid-April, advanced quickly and was 60% complete by early May, 10% ahead of normal. Persistent rains in late May were beneficial for crop growth, but delayed planting completion into June and caused two distinctly different crop maturities. Moisture and temperatures continued ideal in all areas, similar to 2009, and disease pressures were light. Crop development progressed at near normal rates in central, southern and eastern areas, but western and northern areas were later than normal with cool, wet growing conditions. Harvest began in early August, near normal, and good early conditions allowed faster than normal progress into early September when completion reached 70%. Harvest then stalled for three weeks, delayed by crop maturity, cooler than average temperatures and sporadic rains. The last 5% of harvest, mostly in northern Montana, was not completed until early October, well behind average and too late for inclusion in this report.

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, ND. A total of 713 samples were collected from fields, bin sites on farm, or elevators during harvest in Minnesota (122), Montana (125), North Dakota (381) and South Dakota (85). The samples represent approximately 90% of the HRS crop in the four states. Samples were segregated by export region and composited by protein range 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 2010 average grade is US #1 Northern Spring. More than 90% of samples graded #1 and nearly 60% #1 Dark Northern Spring. Production is 6% larger than 2009 and third largest on record. Planted area was up marginally, but yield was a record, surpassing the 2009 record and about 20% above average. The crop shows above average test weight and kernel size, minimal damage and improved protein over the record low protein in 2009.

Adequate moisture and limited disease during the growing season allowed for good kernel development. Average test weight is 61.6 pounds per bushel (81 kg/hl), similar to last year but above the five-year average. Average test weights are slightly lower in West or Pacific Northwest tributary area, compared to the east or Gulf/Great Lakes tributary area. Kernel quality traits, such as ash and size, are also improved over the long-term average. Kernel damage is a mere 0.1%, below the five-year average of 0.3%. DON tests were performed on each of the six protein composites and all showed non-detectable or less than 0.5 ppm values.

Higher protein levels in 2010 compared to 2009 are a plus for traditional buyers, although the record yielding crop still had below average protein, more noticeable across western

areas. The average protein is 13.7%, up from 13.2% in 2009, but below the five-year average of 14.3%. Protein increased most dramatically in the east, averaging 13.7% and up nearly one point from last year. In the PNW region the average protein level is 13.8% compared to 13.7% in 2009. Roughly one-half of the crop is above 14% protein, compared to only one-third last year. In addition, only 6% of the Gulf/Great Lakes tributary crop falls below 12%, compared to nearly 20% last year.

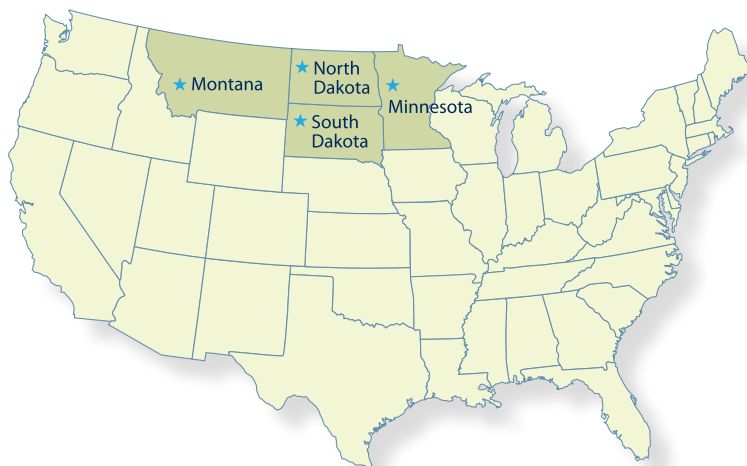
Vitreous kernel counts average 66%, slightly below last year and the five-year average as rain during harvest and lower protein affected kernel color and vitreousness. Western areas show a greater decline in vitreous kernels from the long-term average and may create challenges for buyers demanding DNS. Harvest time rains also reduced average falling number values in the later portion of the harvest, leading to a lower value in the PNW tributary of 366 seconds compared to 375 last year and the five-year average of 409. The Gulf/Great Lakes tributary averages 401 seconds, up from 374 last year.

Flour and Baking Data: The Buhler laboratory mill indicates improved flour extraction over 2009, 70.0% compared with 68.7%. The crop in the eastern area has one and one-half point higher extraction, whereas the western half is one-half point higher. Flour ash averages 0.53%, up slightly from last year and the five-year average.

Dough strength is similar to 2009, but still weaker than traditional HRS strength. Farinograph stability is 9.9 minutes, with the PNW tributary at 10.6 minutes and Gulf/Great Lakes at 9.5 minutes. Dough stability is strongest in the medium and high protein segments of the PNW tributary crop. Absorption values average 65%, about one and one-half points lower than 2009 and about a half point less than the five-year average. The PNW region is showing the most significant decline from last year and the five-year average. Absorption increases with protein content across both export regions.

FOUR STATES SURVEYED

Minnesota • Montana • North Dakota • South Dakota



Average alveograph W-value is higher at 395 than last year at 387. An increase in the east offset a decline in W-values across the west. Based on both the alveograph and the extensograph, dough is less extensible compared to both last year and the five-year average. Dough handling properties are better than last year and the five-year average, however.

Loaf volumes are improved with an average of 947 cubic centimeters compared to 916 last year. A greater gain occurred in the east, which averages 952 cc, compared to the PNW region with 940 cc. Loaf volumes are below the five-year average but they noticeably increase at higher protein levels. Bread quality scores are equal to last year and the five-year average with highest scores in the medium protein segments.

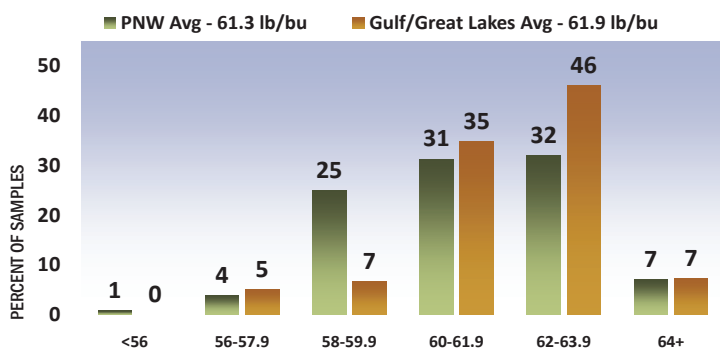
Summary: The 2010 HRS crop has excellent kernel qualities with slightly improved functional quality compared to 2009. Buyers will appreciate the high grade profile with improved protein content and more balanced distribution, especially across the eastern half of the region. Protein is still below the long-term average, but nearly one-half the crop is above 14% protein. Dough strength and bake performance are below HRS traditional levels but similar to 2009. Flour yields and loaf volumes are higher than 2009, and bread quality scores are also good. Some wide quality differences exist, so good communication with sellers and diligent contract specifications will help buyers receive their needed quality.

Continued on next page



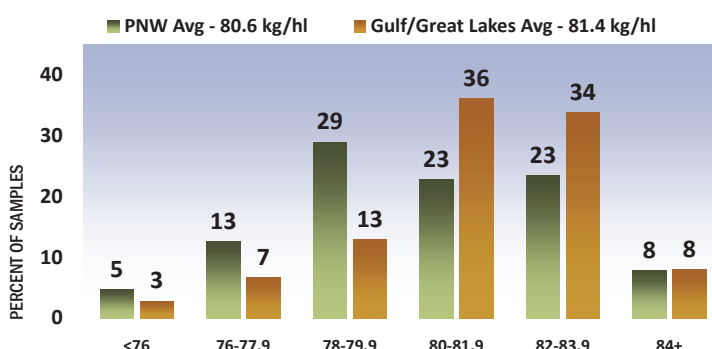
TEST WEIGHT

Pounds/Bushel



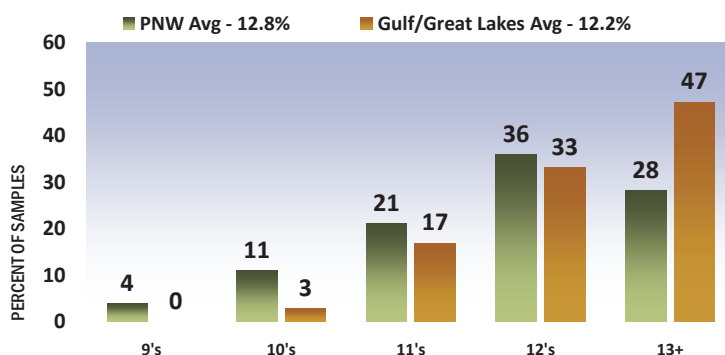
HECTOLITER WEIGHT

Kilograms/Hectoliter



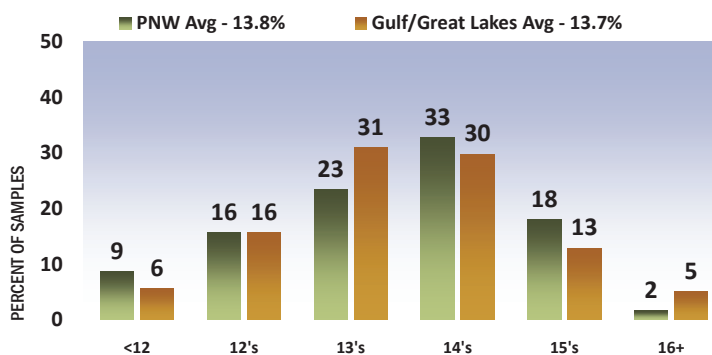
WHEAT MOISTURE

Percent



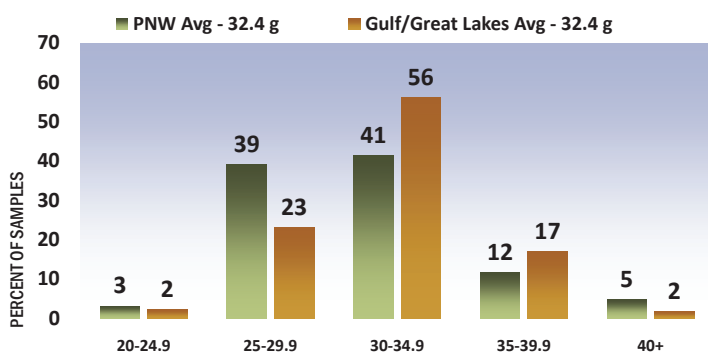
PROTEIN (12% MB)

Percent



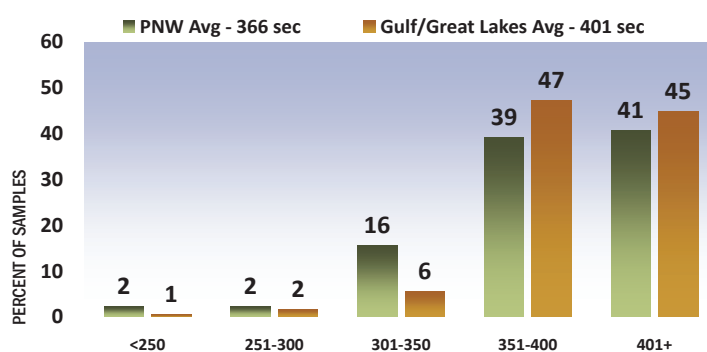
1000 KERNEL WEIGHT

Grams



FALLING NUMBER

Seconds



HARD RED SPRING | HARVEST DATA

EXPORT CARGO SURVEY

The export cargo data represents 485 individual subplot samples provided by USDA's Federal Grain Inspection Service for crop years 2009 (collected from October 2009 through August 2010) and 2008. Of 252 2009-crop samples, 180 were from PNW, 21 from Lakes, and 51 from Gulf ports. Grade data are the official grades on the individual sublots. Milling and baking analyses were conducted by North Dakota State University.



Hard Red Spring	Composite Average					
	2010 By Protein*				2009 Overall	5-year Average
	Low	Med	High	Overall		
Wheat Grade Data:						
Test Weight (lb/bu)	61.7	61.9	61.2	61.6	61.6	60.8
(kg/hl)	81.2	81.4	80.5	81.0	81.0	80.0
Damaged Kernels (%)	0.1	0.1	0.1	0.1	0.1	0.3
Foreign Material (%)	0.0	0.0	0.0	0.0	0.0	0.0
Shrunken & Broken (%)	1.0	1.1	1.2	1.1	0.8	1.4
Total Defects (%)	1.1	1.2	1.2	1.2	0.9	1.7
Vitreous Kernels (%)	55.4	70.9	76.6	66.3	70.9	73.7
Grade	1 NS	1 NS	1 DNS	1 NS	1 NS	1 NS
Wheat Non-Grade Data:						
Dockage (%)	0.6	0.9	0.8	0.7	0.6	0.7
Moisture (%)	12.5	12.5	12.2	12.4	12.7	12.1
Protein (%) 12%/0% moisture basis	12.5/14.2	13.9/15.8	15.2/17.3	13.7/15.6	13.2/15.1	14.3/16.3
Ash (%) 14%/0% moisture basis	1.55/1.80	1.57/1.83	1.60/1.86	1.57/1.83	1.53/1.78	1.60/1.86
1000 Kernel Weight (g)	32.9	31.9	32.3	32.4	33.4	31.1
Kernel Size (%) lg/md/sm	58/41/1	49/49/2	45/52/3	51/47/2	59/39/2	47/47/6
Single Kernel: Hardness	72.7	78.6	74.1	75.0	78.0	79.0
Weight (mg)	36.3	31.9	33.8	34.2	35.4	33.1
Diameter (mm)	2.91	2.75	2.80	2.83	2.86	2.51
Sedimentation (cc)	51.8	62.8	63.1	58.5	58.0	57.7
Falling Number (sec)	387	391	381	387	374	405
Flour Data:						
Lab Mill Extraction (%)	71.0	69.8	69.0	70.0	68.7	68.9
Color: L*	90.8	90.6	90.3	90.6	90.3	90.8
a*	-1.0	-1.0	-1.0	-1.0	-1.1	-1.2
b*	9.2	9.5	9.8	9.5	9.7	9.5
Protein (%) 14%/0% moisture basis	11.4/13.3	12.9/15.0	14.0/16.3	12.6/14.7	12.3/14.3	13.3/15.5
Ash (%) 14%/0% moisture basis	0.52/0.60	0.53/0.62	0.56/0.65	0.53/0.62	0.50/0.58	0.50/0.58
Wet Gluten (%)	29.8	35.1	37.9	33.8	33.8	35.8
Gluten Index	98.5	97.8	94.5	97.2	93.7	90.2
Falling Number (sec)	388	401	390	393	401	419
Amylograph Viscosity: 65g (BU)	600	634	484	579	604	706
100g (BU)	2646	2840	1899	2499	2144	2595
Starch Damage (%)	8.5	8.4	7.8	8.3	7.5	7.6
Dough Properties:						
Farinograph:						
Peak Time (min)	4.1	6.7	6.9	5.7	6.5	8.5
Stability (min)	9.2	10.9	9.9	9.9	10.1	16.0
Absorption (%)	63.6	65.6	66.2	65.0	66.5	66.1
Classification	4.4	5.0	5.0	4.8	4.9	6.2
Alveograph: P (mm)	105	108	100	104	104	109
L (mm)	99	115	113	108	112	111
P/L Ratio	1.06	0.94	0.89	0.97	0.93	0.99
W (10 ⁻⁴ joules)	370	434	386	395	387	416
Extensograph: Resistance (BU)	463/616	486/678	407/623	455/638	376/428	448/533
(45/135 min) Extensibility (cm)	16.1/15.0	16.7/15.5	17.4/16.7	16.7/15.6	19.1/18.3	19.5/18.9
Area (sq cm)	98/121	106/133	92/134	99/129	97/104	113/129
Baking Evaluation:						
Absorption (%)	62.1	64.1	64.7	63.5	65.0	64.6
Crumb Grain and Texture	8.4	8.6	8.1	8.4	8.4	8.3
Loaf Volume (cc)	872	957	1043	947	916	992
% Area Production:	40	32	28	100		

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

PNW Average						Gulf/Great Lakes Average					
2010 By Protein*				2009 Overall	5-year Average	2010 By Protein*				2009 Overall	5-year Average
Low	Med	High	Overall			Low	Med	High	Overall		
61.6	61.4	60.7	61.3	61.7	60.1	61.8	62.2	61.6	61.9	61.6	61.4
81.0	80.7	79.8	80.6	81.1	79.1	81.3	81.8	81.0	81.4	81.0	80.7
0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3	1.7	1.4	1.4	1.0	1.8	0.8	0.8	1.0	0.9	0.7	1.1
1.3	1.8	1.4	1.4	1.0	1.9	0.9	0.9	1.1	1.0	0.9	1.6
65.0	74.0	84.0	73.7	85.0	86.6	49.0	69.0	70.0	61.2	60.6	64.1
1 NS	1 NS	1 DNS	1 NS	1 DNS	1 DNS	1 NS	1 NS	1 NS	1 NS	1 NS	1 NS
0.4	0.5	0.6	0.5	0.5	0.7	0.8	1.1	0.9	0.9	0.8	0.7
13.0	12.8	12.5	12.8	12.1	11.3	12.2	12.4	12.0	12.2	13.2	12.7
12.4/14.1	14.0/15.9	15.2/17.3	13.8/15.7	13.7/15.5	14.8/16.8	12.6/14.3	13.8/15.7	15.2/17.3	13.7/15.6	12.9/14.7	14.0/15.9
1.53/1.78	1.45/1.69	1.50/1.74	1.50/1.74	1.48/1.72	1.57/1.83	1.56/1.81	1.64/1.91	1.69/1.97	1.62/1.88	1.57/1.82	1.62/1.88
33.4	32.3	31.2	32.4	32.7	29.7	32.6	31.6	33.2	32.4	33.9	32.2
52/46/2	46/51/3	41/55/4	47/50/3	52/46/2	35/55/10	62/37/1	50/48/2	48/50/2	54/44/2	64/35/1	56/40/4
72.8	77.3	75.5	75.0	78.1	79.1	72.5	79.4	73.0	75.0	78.0	79.0
33.5	31.5	32.1	32.5	34.9	31.8	38.2	32.1	35.3	35.4	35.8	34.0
2.78	2.70	2.72	2.73	2.82	2.43	3.00	2.78	2.88	2.90	2.89	2.58
53.0	59.0	61.0	57.3	66.2	61.6	51.0	65.0	65.0	59.3	52.0	54.7
363	360	375	366	375	409	403	410	387	401	374	403
69.5	69.3	68.1	69.0	68.4	68.6	71.9	70.1	69.7	70.7	69.0	69.1
90.9	90.7	90.5	90.7	90.4	90.8	90.7	90.6	90.2	90.5	90.2	90.8
-1.2	-1.1	-1.1	-1.2	-1.1	-1.2	-0.9	-0.9	-1.0	-0.9	-1.0	-1.3
9.7	9.7	9.8	9.7	9.9	9.5	8.9	9.3	9.8	9.2	9.6	9.6
11.3/13.1	12.9/15.0	14.0/16.3	12.6/14.7	12.9/15.0	13.9/16.2	11.6/13.5	12.8/14.9	14.0/16.3	12.6/14.7	11.9/13.8	12.9/15.0
0.48/0.56	0.48/0.56	0.52/0.60	0.49/0.57	0.46/0.53	0.49/0.57	0.55/0.64	0.56/0.65	0.59/0.69	0.56/0.65	0.53/0.62	0.50/0.58
29.2	35.6	38.2	34.0	35.8	37.1	30.2	34.8	37.6	33.6	32.4	34.8
98.4	97.3	92.4	96.2	93.3	91.0	98.7	98.1	96.3	97.9	94.0	89.7
390	406	375	390	421	435	387	398	403	395	386	406
604	672	480	584	716	785	598	612	487	575	523	647
2730	2890	1650	2430	2591	2895	2590	2810	2120	2547	1817	2373
8.1	7.9	7.6	7.9	7.3	7.3	8.8	8.7	7.9	8.5	7.6	7.7
5.0	7.0	8.0	6.5	7.8	10.2	3.5	6.5	6.0	5.2	5.6	7.2
9.5	11.5	11.0	10.6	10.6	18.7	9.0	10.5	9.0	9.5	9.7	14.0
63.3	65.2	65.7	64.6	67.8	66.6	63.8	65.8	66.7	65.2	65.5	65.6
5.0	5.0	5.0	5.0	5.0	6.4	4.0	5.0	5.0	4.6	4.9	6.0
108	107	101	105	111	117	103	108	99	104	98	104
100	118	118	111	112	111	98	114	108	106	112	110
1.08	0.91	0.86	0.95	0.99	1.05	1.05	0.95	0.92	0.98	0.88	0.95
378	441	418	409	420	456	365	430	358	386	363	386
471/566	545/734	462/741	490/671	385/423	489/592	458/650	450/644	358/519	430/615	369/431	417/488
17.4/14.3	16.4/16.0	17.2/16.4	17.0/15.5	19.3/19.5	19.5/19.5	15.3/15.4	16.8/15.2	17.6/16.9	16.4/15.7	18.9/17.5	19.4/18.5
109/104	115/146	100/158	108/134	99/110	124/147	91/133	100/126	84/112	92/125	95/100	105/115
61.8	63.7	64.2	63.1	66.3	65.1	62.3	64.3	65.2	63.7	64.0	64.1
8.3	8.8	8.0	8.3	8.3	8.3	8.5	8.5	8.3	8.4	8.5	8.2
840	968	1035	940	927	1007	893	950	1050	952	909	984
39	29	32	100			40	34	25	100		

HARD RED SPRING | EXPORT CARGO DATA

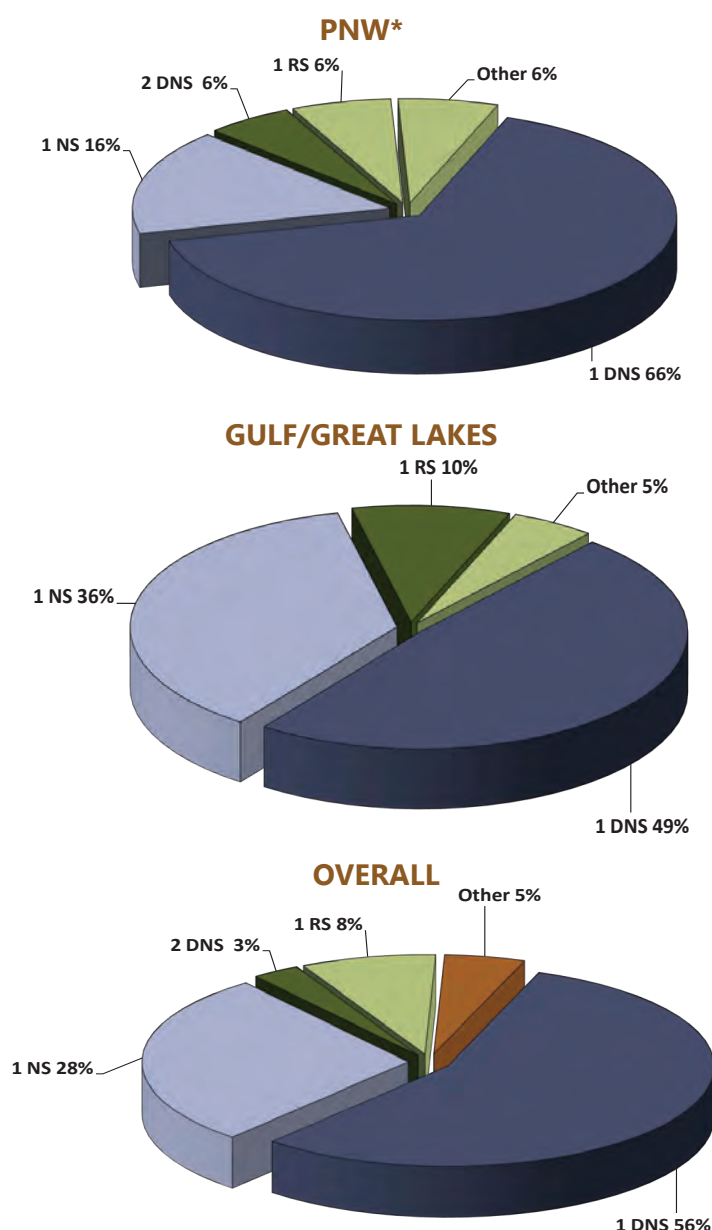
Hard Red Spring	PNW Average		Great Lakes Average		Gulf Average	
	2009	2008	2009	2008	2009	2008
Wheat Grade Data:						
Test Weight (lb/bu)	62.5	61.7	62.8	62.6	62.0	61.9
(kg/hl)	82.1	81.2	82.5	82.3	81.6	81.4
Damaged Kernels (%)	0.3	0.5	1.2	1.2	1.1	1.1
Foreign Material (%)	0.1	0.1	0.1	0.1	0.1	0.1
Shrunken & Broken (%)	0.9	1.2	0.7	1.1	0.7	0.9
Total Defects (%)	1.3	1.8	1.9	2.4	2.0	2.1
Vitreous Kernels (%)	73.9	75.1	50.7	47.0	54.4	55.3
Grade	1 NS	1 DNS	1 NS	1 NS	1 NS	1 NS
Wheat Non-Grade Data:						
Dockage (%)	0.3	0.3	0.5	0.6	0.6	0.7
Moisture (%)	11.8	11.5	13.0	12.3	13.1	12.8
Protein (%) 12%/0% moisture basis	13.5/15.3	13.9/15.8	12.7/14.4	13.7/15.6	13.1/14.9	13.7/15.5
Ash (%) 14%/0% moisture basis	1.48/1.73	1.52/1.77	1.48/1.72	1.56/1.82	1.53/1.78	1.56/1.82
1000 Kernel Weight (g)	34.7	33.9	33.4	33.2	34.9	33.6
Kernel Size (%) lg/md/sm	58/40/2	52/47/3	58/40/2	59/40/2	63/35/2	57/42/2
Single Kernel: Hardness	77.3	76.9	80.9	79.5	78.2	79.2
Weight (mg)	33.1	31.6	32.5	31.1	32.8	31.2
Diameter (mm)	2.55	2.48	2.54	2.51	2.56	2.50
Sedimentation (cc)						
Falling Number (sec)	399	401	391	390	394	408
Flour Data:						
Lab Mill Extraction (%)	71.2	70.6	72.9	70.2	72.1	71.2
Color: L*	90.1	90.3	89.8	90.0	89.9	90.0
a*	-0.9	-0.9	-0.8	-1.0	-0.9	-1.0
b*	8.8	9.3	8.9	9.7	8.9	9.7
Protein (%) 14%/0% moisture basis	12.7/14.7	13.0/15.1	11.9/13.8	12.5/14.6	12.3/14.3	12.7/14.7
Ash (%) 14%/0% moisture basis	0.54/0.63	0.54/0.63	0.57/0.67	0.55/0.63	0.57/0.67	0.57/0.66
Wet Gluten (%)	35.0	35.1	31.0	33.5	33.4	34.1
Gluten Index	91.8	90.9	95.9	90.6	92.3	91.9
Falling Number (sec)	435	454	411	417	419	442
Amylograph Viscosity: 65g (BU)	581	605	461	591	503	614
100g (BU)						
Starch Damage (%)						
Dough Properties:						
Farinograph:						
Peak Time (min)	7.1	7.1	6.3	6.8	6.6	6.8
Stability (min)	10.8	10.9	10.6	12.4	10.6	11.6
Absorption (%)	67.7	66.9	68.0	66.0	67.5	66.6
Classification	4.9	5.0	4.9	5.5	4.9	5.2
Alveograph: P (mm)	120	108	138	110	123	112
L (mm)	101	108	75	98	90	100
P/L Ratio	1.19	1.00	1.84	1.12	1.37	1.11
W (10 ⁻⁴ joules)	397	387	377	373	371	384
Extensograph: Resistance (BU)						
(45/135 min) Extensibility (cm)						
Area (sq cm)						
Baking Evaluation:						
Absorption (%)	66.6	65.4	66.5	63.8	66.4	65.0
Crumb Grain and Texture	8.4	8.8	8.3	8.9	8.3	8.8
Loaf Volume (cc)	905	965	851	927	889	948
Sample Count:	180	160	21	15	51	58

Hard Red Spring Production

for the major producing states (million metric tons)

	2010	2009	2008	2007	2006
Minnesota	2.3	2.2	2.7	2.1	2.1
Montana	2.8	1.9	1.6	1.5	1.7
North Dakota	7.8	7.9	6.7	6.4	5.8
South Dakota	1.6	1.8	1.9	1.4	1.2
Four-State Total	14.6	13.8	12.9	11.4	10.8
Total HRS Production	15.8	14.9	13.9	12.2	11.8

Based on USDA crop estimates of September 30, 2010.



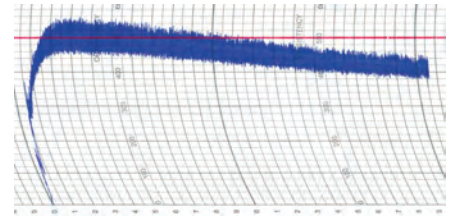
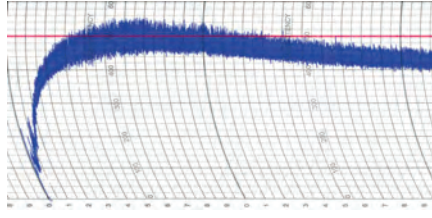
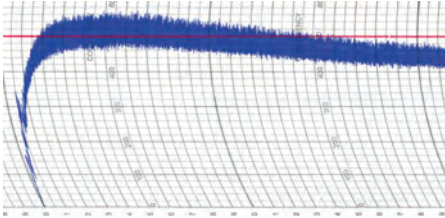
* Harvest delays prevented 10% of PNW samples from being collected; of all samples collected, 40% were graded.

ABOUT HARD RED SPRING WHEAT

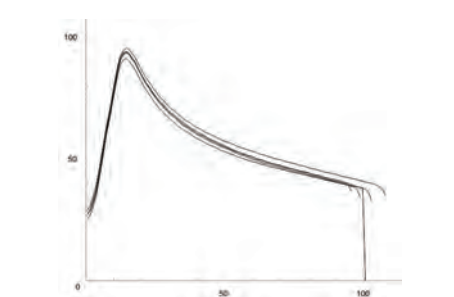
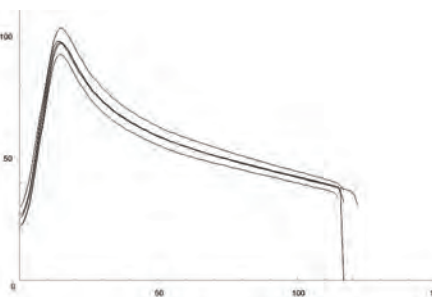
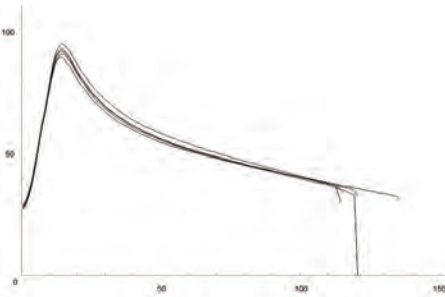
Highest protein content, hard endosperm, red bran, strong gluten, high water absorption. Used in pan breads, hearth breads, rolls, croissants, bagels, hamburger buns, pizza crust and for blending.



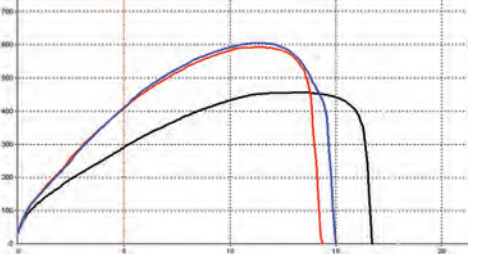
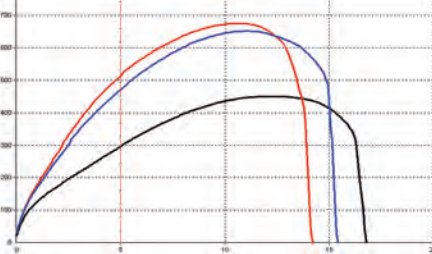
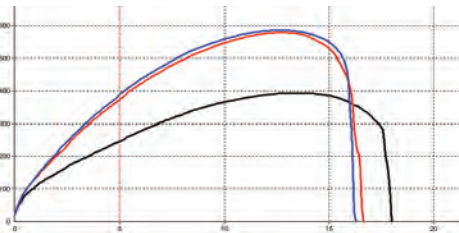
FARINOGRAMS*



ALVEOGRAMS



EXTENSOGRAMS



HIGH PROTEIN

MEDIUM PROTEIN

LOW PROTEIN

*Representing 2010 Composite Average



HARVEST SURVEY

Hard white wheat (HW) was primarily grown in the states of Idaho, Kansas, Colorado, and California this year. Other states such as Nebraska and Washington have limited production. According to the USDA report (September 30, 2010), total 2010 HW production is estimated at 622,000 metric tons (MT), a decrease from last year's 710,000 MT.

Survey Methods: HW samples were submitted from four regions: Pacific Northwest (PNW), California, Southern Plains, and Northern Plains. Samples from the PNW were collected by the USDA's National Agricultural Statistics Service. Samples from three other regions were either collected by Plains Grains, Inc., Stillwater, OK, or sent directly to the Wheat Marketing Center by growers. These samples represented diverse growing conditions across the country. Wheat grading and protein were conducted by the Federal Grain Inspection Service (FGIS), Portland, Oregon. All other tests were conducted by the Wheat Marketing Center (WMC), Portland, Oregon.

HW samples were made into eight composites, based on four regions (PNW, California, Southern Plains, and Northern Plains) and four protein levels (less than 11.5%, 11.5 – 12.5%, 12.6 – 13.5%, and higher than 13.5%). Wheat and flour tests were done according to the AACC International Approved Methods (11th Edition). Chinese raw and wet noodle testing and steamed bread evaluation were conducted according to protocols established by Asian noodle and steamed bread makers and flour millers at WMC during the US Wheat Associates' Asian Products Collaborative Program.

Wheat and Grade Data: All samples graded US #1 with test weights from 60.9 to 63.8 lb/bu (80.1 to 83.8 kg/hl). Wheat moisture was in the range of 7.8%-11.2%. Similar to historic data, PNW and California composites had lower wheat moisture than the Southern Plains and the Northern Plains. The California composite had the highest thousand kernel weight and kernel diameter. Falling number values were 339 seconds or higher, indicating sound grain.

Flour, Dough and Baking Data: Buhler laboratory mill straight grade flour extractions ranged from 70.0% to 73.7% and flour ash contents varied from 0.41% to 0.54% (14% mb). These values suggest good milling performance.

Flour wet gluten contents were from 25.8% to 39.1%. Amylograph peak viscosities were between 716 and 1029 BU, which showed good starch pasting property. Starch damage values were in the range of 3.1% to 5.0%, lower than previous years. Lactic acid SRC values were 124% or higher, indicating good gluten strength for bread baking.

Farinograph absorption ranged from 54.2% to 61.1%, lower

than previous years, possibly related to lower starch damage levels. Farinograph stability times were 8.7-22.2 minutes, showing typically medium to strong dough characteristics of HW wheat. HW usually has similar farinograph water absorption to HRW, but the stability time is much longer indicating more tolerance to overmixing. The ranges of alveograph values were: 52-81 mm for P values; 154-203 mm for L values; and 222-433 10^{-4} joules for W values. Extensograph data at 135-minute resting showed that maximum resistance was in the range of 351-927 BU, and extensibility was from 12.9-18.3 cm. Compared to HRW, this year's HW showed longer alveograph L values and extensograph extensibility.

Most samples showed good baking performance with the bake absorption in the range of 58.0%-66.1%, loaf volume from 746 to 1031 cc, and the crumb grain and texture scores of 6.0-8.5 points.

Noodle Evaluation: HW flours and a control flour were evaluated for both Chinese raw noodles (white salted) and Chinese wet noodles (yellow alkaline). Chinese raw noodle color was acceptable for the low and medium protein composite samples, but was duller for the high protein and the very high protein composites. However, the boiled noodle texture was excellent this year for all samples. Both noodle firmness and chewiness had much higher values than previous years.

Chinese wet noodle color was acceptable for the low and the medium protein composites. The high protein composite from the Southern Plains also had an acceptable noodle color. However, the high protein composite from California and the Northern Plains had lower color stability scores. The texture of cooked Chinese wet noodles was excellent for all samples.

It is recommended to blend 10%-20% soft white into this year's HW to improve the noodle color while maintaining acceptable noodle texture.

Steamed Bread Evaluation: HW flours were evaluated for Asian steamed breads in comparison with a control flour. Results showed that most samples were acceptable for steamed breads except for the low-protein and the high-protein composites from the Southern Plains, which had slightly lower scores.

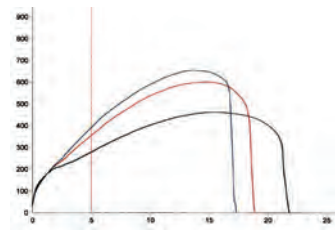
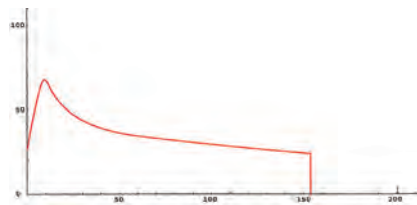
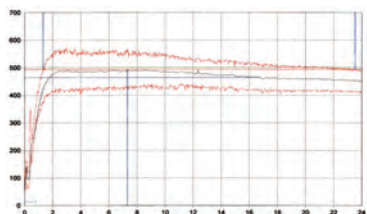
Summary: This year, the US HW production was estimated at 622,000 metric tons, reduced from last year. Quality analyses of this year's samples showed very good quality performance in milling, dough rheological properties, and end-products including pan breads, Asian noodles, and steamed breads. For Asian noodle application, blending 10%-20% soft wheat into this year's HW may improve noodle color while maintaining acceptable noodle texture.

FARINOGRAMS

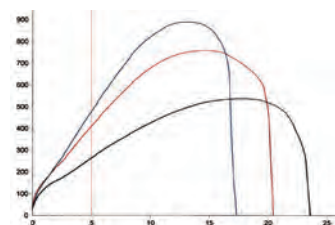
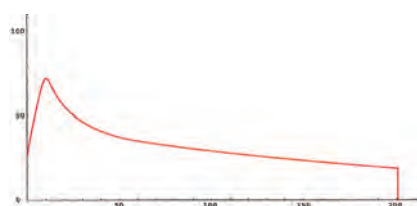
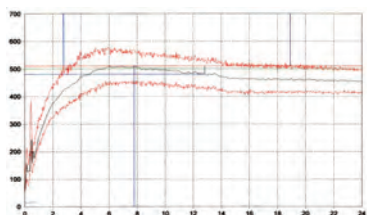
ALVEOGRAMS

EXTENSOGRAMS

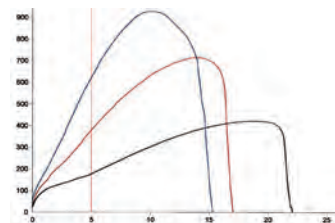
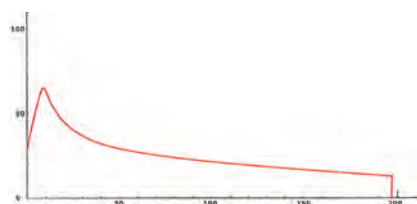
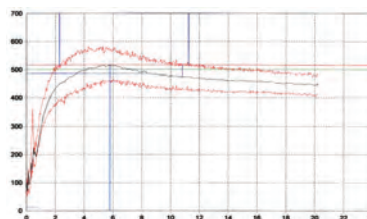
PNW LOW



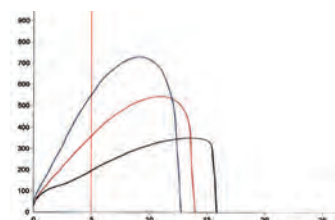
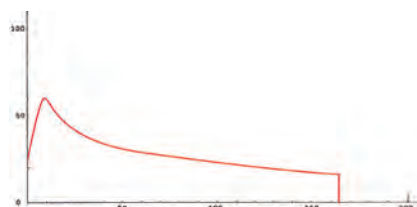
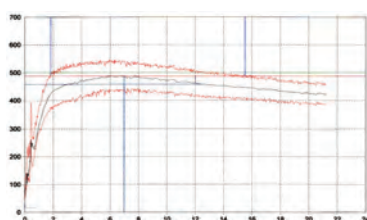
PNW VERY HIGH



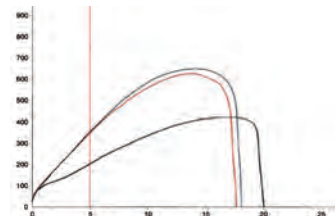
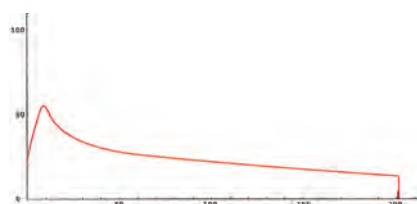
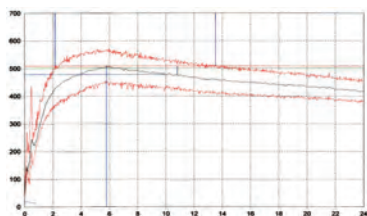
CALIFORNIA HIGH



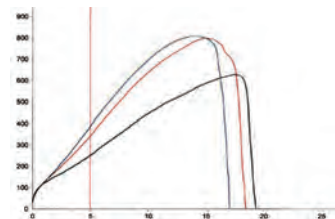
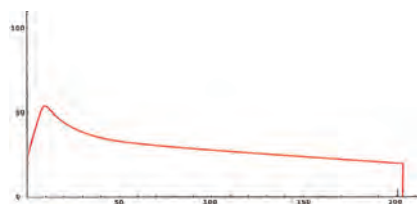
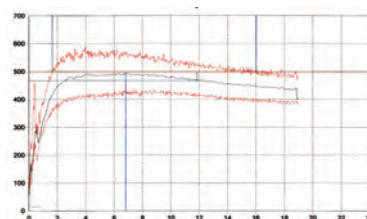
SOUTHERN PLAINS MEDIUM



SOUTHERN PLAINS HIGH



NORTHERN PLAINS HIGH



Hard White	Pacific Northwest		California	Southern Plains			Northern Plains	
	Low	Very High	High	Low	Medium	High	High	Very High
Wheat Grade Data:								
Test Weight (lb/bu)	61.4	60.9	63.8	61.6	62.6	62.5	62.3	62.3
(kg/hl)	80.7	80.1	83.8	81.0	82.3	82.2	81.9	81.9
Damaged Kernels (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign Material (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Shrunken & Broken (%)	1.6	1.9	0.5	0.8	0.7	1.3	0.5	0.5
Total Defects (%)	1.6	1.9	0.5	0.8	0.7	1.3	0.7	0.5
Grade	1 HW	1 HW	1 HW	1 HW	1 HW	1 HW	1 HW	1 HW
Wheat Non-Grade Data:								
Dockage (%)	1.0	0.5	0.0	0.9	0.8	0.5	0.2	0.1
Moisture (%)	9.1	9.8	7.8	10.8	10.4	11.2	9.6	10.2
Protein (%) 12%/0% moisture basis	11.1/12.6	13.9/15.8	12.7/14.4	10.9/12.4	12.4/14.1	13.1/14.9	13.2/15.0	13.9/15.8
Ash (%) 14%/0% moisture basis	1.41/1.64	1.51/1.76	1.37/1.59	1.40/1.63	1.36/1.58	1.55/1.80	1.63/1.90	1.43/1.66
1000 Kernel Weight (g)	33.7	32.4	37.0	32.1	28.8	29.7	29.2	31.9
Kernel Size (%) lg/md/sm	80/19/1	77/22/1	85/14/1	75/25/0	59/40/1	50/49/1	71/28/1	74/25/1
Single Kernel: Hardness	69.5	69.7	73.8	57.5	78.4	75.3	71.7	58.7
Weight (mg)	35.3	38.0	40.4	31.7	29.5	28.0	31.3	32.8
Diameter (mm)	2.70	2.78	2.91	2.67	2.54	2.57	2.64	2.69
Sedimentation (cc)	48.2	47.3	50.2	53.7	39.7	40.0	49.9	33.0
Falling Number (sec)	352	339	431	455	373	385	441	342
Flour Data:								
Lab Mill Extraction (%)	71.8	70.0	72.5	72.0	71.3	71.1	73.7	70.5
Color: L*	91.9	90.9	90.9	91.6	91.2	90.7	92.4	92.0
a*	-2.4	-2.1	-2.1	-2.3	-2.5	-2.3	-2.0	-2.0
b*	8.9	8.7	8.4	8.5	10.0	9.7	8.0	6.9
Protein (%) 14%/0% moisture basis	10.2/11.9	12.9/15.0	12.1/14.1	9.6/11.2	11.5/13.4	12.1/14.1	12.1/14.0	12.6/14.7
Ash (%) 14%/0% moisture basis	0.47/0.55	0.54/0.63	0.50/0.58	0.50/0.58	0.50/0.58	0.54/0.62	0.50/0.58	0.41/0.48
Wet Gluten (%)	25.8	34.3	26.4	27.6	28.7	32.1	30.2	39.1
Gluten Index	97.8	96.3	97.6	94.5	93.8	96.3	99.4	88.2
Falling Number (sec)	360	421	424	389	420	393	425	500
Amylograph Viscosity 65 g (BU)	976	756	794	716	1029	772	799	803
Starch Damage (%)	4.8	4.6	5.0	3.6	3.1	3.8	4.2	3.5
Solvent Retention Capacity (%)								
Water/50% Sucrose	62/120	61/120	61/114	56/95	58/107	56/101	55/101	57/105
5% Lactic Acid/5% Na ₂ CO ₃	156/88	153/81	149/82	124/72	138/74	141/71	154/67	161/68
Dough Properties:								
Farinograph:								
Peak Time (min)	7.4	7.8	5.8	2.7	7.0	5.8	6.9	7.3
Stability (min)	22.2	16.2	9.0	8.7	13.7	11.4	14.4	19.1
Absorption (%)	55.5	61.1	60.3	54.2	57.7	58.8	56.4	58.7
Alveograph: P (mm)								
L (mm)	75	81	73	52	68	61	59	67
P/L Ratio	154	202	198	154	164	203	203	202
W (10-4 joules)	0.49	0.40	0.37	0.34	0.41	0.30	0.29	0.33
Extensograph: Resistance (BU)	358	432	337	222	307	329	384	398
(45/135 min) Extensibility (cm)	461/653	536/888	421/927	315/351	350/728	420/648	627/806	476/887
Area (sq cm)	21.8/17.4	23.7/17.4	22.0/15.4	19.2/17.9	16.0/12.9	20.2/18.3	19.3/17.1	22.1/14.7
	137/145	162/188	112/173	85/83	69/115	105/147	134/159	129/153
Baking Evaluation:								
Bake Absorption (%)	60.6	66.1	64.6	58.0	61.9	62.6	60.9	63.4
Crumb Grain and Texture	6.3	7.5	6.5	6.8	7.5	8.5	8.0	6.8
Loaf Volume (cc)	853	954	860	746	826	1031	976	856

* 2010 Protein Ranges: Low, Less than 11.5%; Medium, 11.5 - 12.5%; High, 12.6% - 13.5%; Very High, Greater than 13.5%.

Hard White	Pacific Northwest		California	Southern Plains			Northern Plains	
	Low	Very High	High	Low	Medium	High	High	Very High
Chinese Raw Noodle-Making Quality:								
Color at 0/24 hour: L*	83.5/69.5	79.9/66.0	80.0/66.8	81.4/71.0	79.9/69.9	78.8/69.5	78.3/68.9	77.9/68.2
a*	0.1/0.7	0.8/1.4	0.4/0.9	0.0/0.9	0.1/0.8	0.5/1.5	0.8/1.3	0.8/1.3
b*	20.4/23.6	22.0/22.3	21.1/21.2	21.1/23.4	24.3/25.2	23.7/25.3	21.9/21.6	20.3/19.9
Change in L* (0-24 hr)	14.0	13.9	13.2	10.4	10.0	9.3	9.4	9.7
Cooking Yield (5 min, %)	104	105	108	108	107	100	105	105
Sensory Color Stability Score	5.8	5.3	5.2	6.5	6.0	5.8	5.0	5.0
Instrumental Texture:								
Firmness (g)	1213	1265	1145	1223	1325	1403	1196	1373
Springiness (%)	94.4	94.8	95.2	96.7	94.4	95.1	94.9	96.5
Cohesiveness	0.66	0.65	0.65	0.64	0.64	0.62	0.64	0.64
Chewiness (g)	758	773	703	754	794	826	724	842
Chinese Wet Noodle-Making Quality:								
Uncooked Color at 0/24 hour: L*	78.5/67.9	75.0/64.2	75.1/62.4	77.9/68.5	77.2/67.6	76.8/67.1	76.1/66.4	75.4/66.8
a*	-2.0/-0.3	-1.7/0.0	-1.3/0.5	-1.7/-0.4	-1.6/0.0	-1.3/0.0	-0.9/0.6	-0.8/0.5
b*	24.6/25.3	24.0/22.9	21.2/20.9	24.9/25.5	25.9/26.1	25.4/25.5	22.4/22.7	22.4/22.5
Change in L* (0-24 hr)	10.6	10.8	12.7	9.4	9.6	9.7	9.7	8.6
Parboiled Color at 0/24 hour: L*	75.8/75.6	74.4/74.5	74.2/74.1	76.6/77.0	76.0/76.2	75.0/75.0	73.4/74.0	74.1/74.1
a*	-2.1/-2.7	-1.1/-1.9	-1.0/-1.4	-2.5/-2.9	-2.4/-2.7	-1.1/-1.9	-1.3/-1.6	-1.0/-1.5
b*	30.8/29.2	27.7/26.3	26.4/25.2	30.3/28.9	30.3/29.5	29.3/27.8	26.4/25.6	25.7/24.8
Cooking Yield (1.5 min, %)	61	63	61	63	64	60	63	62
Uncooked Color Stability Score	6.7	6.2	5.3	6.8	6.5	6.5	5.8	5.8
Parboiled Color Stability Score	6.3	5.5	5.3	6.3	6.3	6.3	5.5	5.5
Instrumental Texture:								
Firmness (g)	901	920	913	922	950	986	984	1021
Springiness (%)	95.7	97.0	96.3	95.4	95.3	96.1	96.1	96.8
Cohesiveness	0.63	0.65	0.63	0.63	0.61	0.62	0.62	0.61
Chewiness (g)	546	570	551	553	556	585	584	600
Asian-Type Steamed Bread Evaluation:								
Specific Volume (ml/g)	3.2	3.6	3.2	3.3	3.6	3.8	3.5	3.1
Total Score	68.3	68.3	68.3	66.3	68.0	66.8	69.0	70.0

* 2010 Protein Range: Low, Less than 11.5%; Medium, 11.5 - 12.5%; High, 12.6% - 13.5%; Very High, Greater than 13.5%.

ABOUT HARD WHITE WHEAT

Medium to high protein content, hard endosperm, white bran. Used in Asian noodles, whole wheat or high extraction flour applications, pan breads and flat breads.



NORTHERN GREAT PLAINS

Weather and Harvest: Planting began in late April, slightly behind average but ahead of the very slow 2009 pace. Cool, wet conditions prevailed throughout much of May delaying final plantings until the middle of June. Moisture levels were adequate and temperatures were cooler than normal, promoting high yield potential throughout the growing season. Development of the crop remained behind the five-year average for most of the season with very little stress.

Harvest began in mid-August, ahead of last year's abnormally slow pace, but behind average. In mid-September, persistent precipitation stalled harvest substantially, especially areas in Montana and northwest North Dakota. Harvest pace fell well behind average for the last portion of the crop as a result of slow crop maturity and cool, humid conditions. Harvest was finished in mid-October. The late harvest prevented analysis of the last 20% of the Montana crop.

Survey Methods: A total of 204 samples were collected from the primary durum growing area of North Dakota (160) and Montana (44). State offices of the National Agricultural Statistics Service collected samples directly from producers in the field, local elevators or farm bins. These samples represent the grain at the point of origin before any conditioning or market blending, and represent the entire harvested crop, not just the crop being marketed at harvest time. Analysis was conducted by the Durum Quality Lab, North Dakota State University, Fargo, North Dakota.

Wheat and Grade Data: The 2010 northern U.S. durum crop is about 15% larger than last year due to higher planted area and record yields. The crop averages #1 Hard Amber Durum, the same as last year. However, the prolonged, wet harvest caused a wider distribution of quality and somewhat reduced kernel quality traits and pasta processing performance in a greater than normal share of the crop.

Average test weight is 60 pounds per bushel (78.1 kg/hl), down from last year but similar to the five-year average. Thousand kernel weights average 40 grams, down from 42 in 2009, but well above the five-year average of 36 grams. The average protein is similar to last year, at 13.4%, but below the five-year average due to the strong yields. Still, more than 60% of the crop is above the typical minimum industry demand of 13%.

ABOUT DURUM WHEAT

Durum is the hardest of all wheats, high protein content, yellow endosperm, white bran. Used to make pasta, couscous, and some Mediterranean breads.

Average damage is 1.3%, about a point higher than the five-year average due to some disease pressures during the growing season and harvest time rains. Correspondingly, average falling number values fell to 335 seconds compared to 398 in 2009, but nearly 80% of the crop is still above 300 seconds. The average vitreous kernel count is 82%, similar to last year, but down from the five-year average, as lower than average protein levels and harvest rains affected vitreousness.

Semolina and Processing Data: Milling performance, based on a Buhler laboratory mill, reveals increases in both semolina and total extraction. Total extraction is 73.4% and semolina extraction is 66.3%, both of which are about a point higher than 2009 and 2 to 3 points higher than average. Semolina ash values are higher than 2009, but lower than the five-year average. Semolina mixing values are similar to last year with a mixogram score of 5.4 (scale 1-8). The average gluten index value is 55%, above the five-year average, with a range of 48 to 79. Pasta quality factors are reflective of the weather's effect on this year's crop with lower color scores and reduced cooked firmness values.

Summary: The 2010 crop is of average to good quality, and diligent buyers will find more than adequate quantities of the crop with high grades and sound kernel quality that will produce excellent pasta and couscous. Large carryover supplies from 2009 and the higher than average production in 2010 provide a good pool of high quality durum to select from to produce quality end products. Given the wider spread in quality parameters and market values with the 2010 crop, detailed communication between buyers and sellers on contract specifications will take on added importance.

OTHER DURUM PRODUCTION AREAS

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 "identity preserved" to U.S. domestic and export markets. The identity preservation system allows buyers to purchase grain varieties having intrinsic quality parameters specific to their needs. Annual production requirements can be contracted ahead with experienced growers who plant certified seed. Handlers then store grain by varietal identity for season-long shipment on the buyers' preferred schedules.

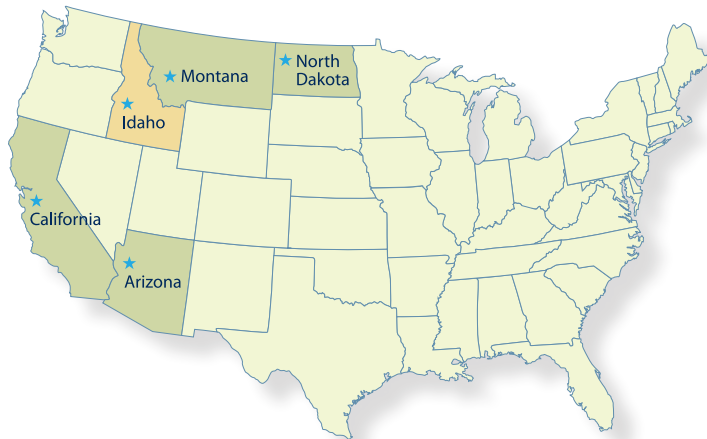
Desert Durum® acreage planted in Arizona and southern California for 2010 was about 30% less than in 2009. Grain yields were slightly greater than the expected average. The crop again exhibits consistently large kernel size and low moisture, traits that contribute to achieving high extraction rates. Overall, grain quality characteristics are similar to

expectations. In summary, the 2010 Desert Durum® crop will deliver the valuable milling, semolina, and pasta quality traits that customers have come to expect.

Idaho: Idaho is gaining popularity as a durum-growing area because of its high desert environment and abundance of irrigation water. Durum grown in Idaho is noted for its mellow gluten, which is very good in fresh pasta. Quality data on Idaho's durum crop is available from the Idaho Wheat Commission.

EXPORT CARGO SURVEY

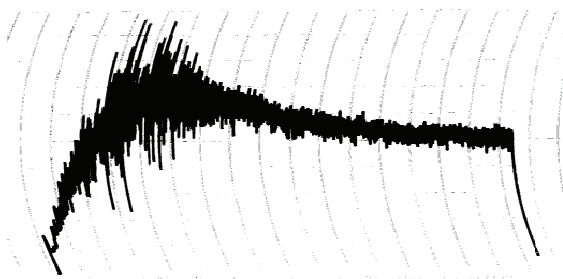
The durum export cargo data represents 35 individual subplot samples provided by USDA's Federal Grain Inspection Service for crop year 2009 (collected from October 2009 through June 2010) and 39 samples for 2008. Grade data are the actual official grades on the individual subplots. Processing analysis was conducted by North Dakota State University.



FOUR OF FIVE STATES SURVEYED

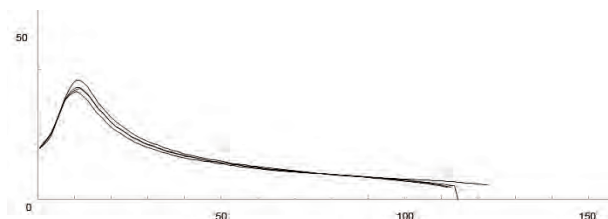
Arizona • California • Montana • North Dakota

GREAT PLAINS DURUM REGIONAL AVERAGE



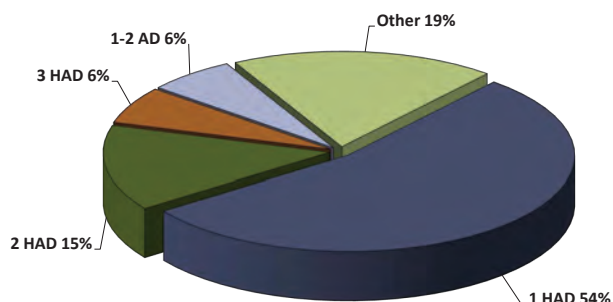
MIXOGRAM

(SCORE = 5.4)



ALVEOGRAM

GREAT PLAINS DURUM GRADE DISTRIBUTION

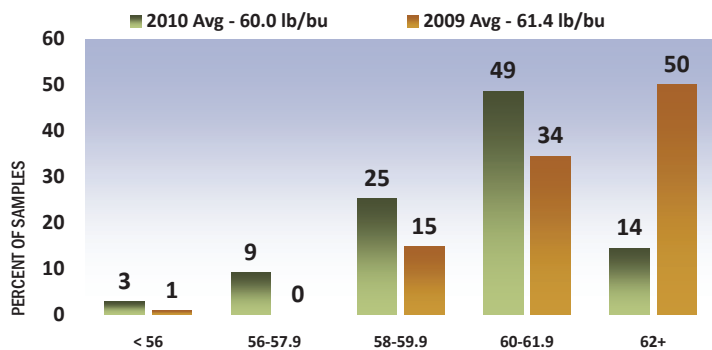


Durum	Harvest Data					Export Cargo Data			
	Northern			Pacific Southwest		Northern		Pacific Southwest	
	2010	2009	5-Year Avg	2010	2009	2009	2008	2009	2008
Wheat Grade Data:									
Test Weight (lb/bu)	60.0	61.4	60.4	62.7	62.7	62.0	61.0	62.3	62.5
(kg/hl)	78.1	80.0	78.7	81.7	81.7	80.8	79.4	81.1	81.4
Damaged Kernels (%)	1.3	0.3	0.4	0.4	0.3	1.1	1.6	0.7	0.5
Foreign Material (%)	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
Shrunken and Broken (%)	0.8	0.7	1.3	0.4	0.4	1.0	1.6	0.7	0.7
Total Defects (%)	2.0	1.1	1.7	0.9	0.7	2.2	3.3	1.5	1.4
Contrasting Classes (%)	0.7	0.3	0.1	0.0	0.0	1.0	0.9	0.2	0.1
Vitreous Kernels (%)	82.0	83.0	88.0	96.1	95.4	81.9	79.9	94.3	93.7
Grade	1 HAD	1 HAD	1 HAD	1 HAD	1 HAD	1 HAD	2 HAD	1 HAD	1 HAD
Wheat Non-Grade Data:									
Dockage (%)	0.9	1.4	1.6	0.3	0.2	0.5	0.6	0.6	0.7
Moisture (%)	11.5	11.8	11.8	6.5	6.8	11.5	11.2	7.2	7.9
Protein (%) 12%/0% moisture basis	13.4/15.3	13.5/15.4	14.4/16.3	13.0/14.8	13.3/15.1	13.3/15.2	15.0/17.0	13.6/15.4	13.4/15.2
Ash (%) 14%/0% moisture basis	1.56/1.83	1.42/1.65	1.56/1.83	1.70/2.0	1.70/1.97	1.49/1.73	1.57/1.82	1.56/1.82	1.63/1.89
1000 Kernel Weight (g)	40.3	42.4	36.0	49.8	54.7	41.4	34.7	46.8	46.2
Kernel Size (%) lg/md/sm	43/54/3	55/42/3	39/54/7	93/7/0	93/7/0	52/44/3	40/53/6	73/26/2	80/19/2
Falling Number (sec)	335	398	370			380	322	843	852
Sedimentation (cc)	43	50	50						
Semolina Data:									
Lab Mill Extraction (%)	73.4	72.7	70.6	75.1	77.6	73.4	71.6	68.5	73.4
Semolina Extraction (%)	66.3	65.5	64.4	61.8	62.8	66.6	65.1	63.1	67.0
Ash (%) 14%/0% moisture basis	0.67/0.78	0.62/0.72	0.69/0.80	0.84/0.97	0.88/1.03	0.62/0.73	0.64/0.74	0.69/0.80	0.67/0.78
Specks (no/10 sq in)	41	26	22	6	6	29	28	23	25
Protein (%) 14%/0% moisture basis	12.4/14.4	12.2/14.2	13.4/15.6	12.0/14.0	12.0/13.9	11.9/13.9	13.4/15.6	12.0/13.9	11.8/13.7
Wet Gluten (%)	35.3	34.8	37.6	30.7	35.0				
Gluten Index	55.2	58.9	50.0			60.5	50.6	91.6	88.1
Mixograph Classification	5.4	5.5	5.6			5.4	5.4	7.7	7.3
Alveograph: P (mm)	42.0	54.0	47.0	83.4	82.5				
L (mm)	102.0	104.0	78.0	62.8	54.9				
P/L Ratio	0.43	0.53	0.63	1.40	1.50				
W (10-4 joules)	105	146	100	172	166				
Color: L*	84.5	85.8	85.0			85.5	85.2	85.9	85.1
a*	-2.5	-3.1	-2.7			-2.9	-2.7	-2.7	-2.6
b*	27.6	28.1	27.9	26.4	25.2	26.8	26.4	25.5	26.5
Spaghetti Processing Data:									
Color Score	8.3	9.5	9.1	8.8	8.5	9.1	8.8	9.3	9.1
Cooked Weight (gm)	31.4	31.6	31.5	30.4	29.9	32.3	32.0	33.0	31.1
Cooking Loss (%)	6.4	6.1	5.7	8.0	7.8	6.0	5.4	5.9	6.1
Cooked Firmness (g cm)	4.5	5.0	5.6	7.5	7.4	4.7	5.1	4.7	4.9
Sample Count:						29	17	6	22



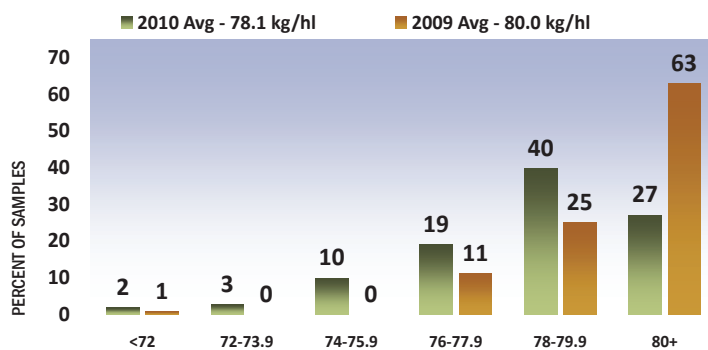
TEST WEIGHT

Pounds/Bushel



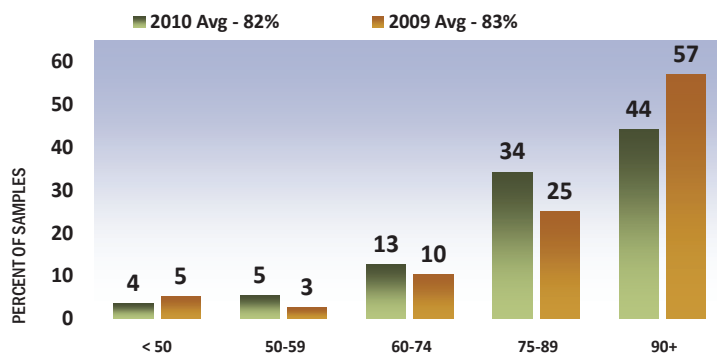
HECTOLITER WEIGHT

Kilograms/Hectoliter



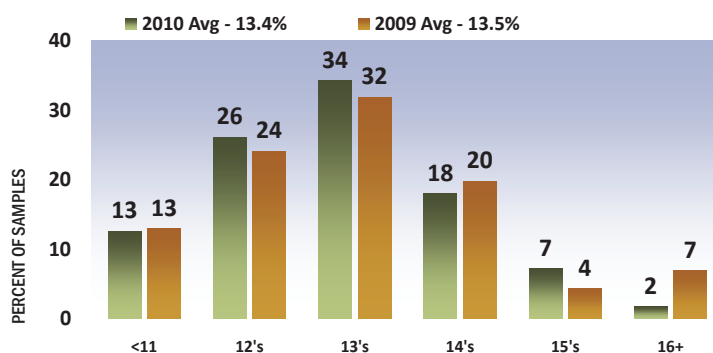
VITREOUS KERNELS

Percent



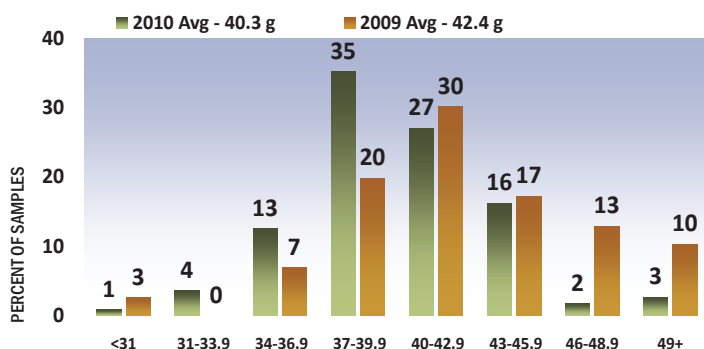
PROTEIN (12% MB)

Percent



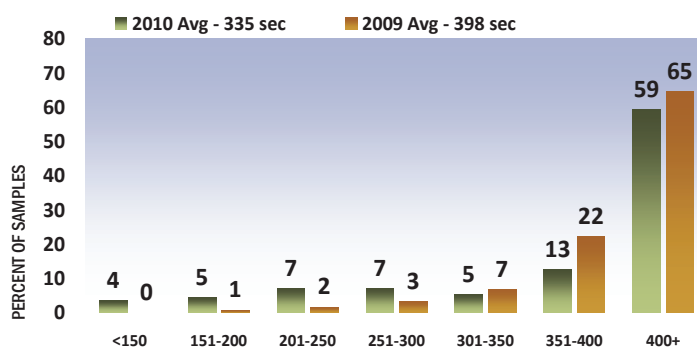
1000 KERNEL WEIGHT

Grams



FALLING NUMBER

Seconds



Durum Production

for the major producing states (million metric tons)

	2010	2009	2008	2007	2006
Arizona	0.2	0.3	0.4	0.2	0.2
California	0.3	0.5	0.4	0.2	0.2
Idaho	0.0	0.0	0.0	0.0	0.0
Montana	0.5	0.5	0.3	0.3	0.2
North Dakota	1.9	1.7	1.1	1.2	0.9
Total Durum Production	3.0	3.0	2.3	2.0	1.5

Based on USDA crop estimates of September 30, 2010.

HARVEST SURVEY

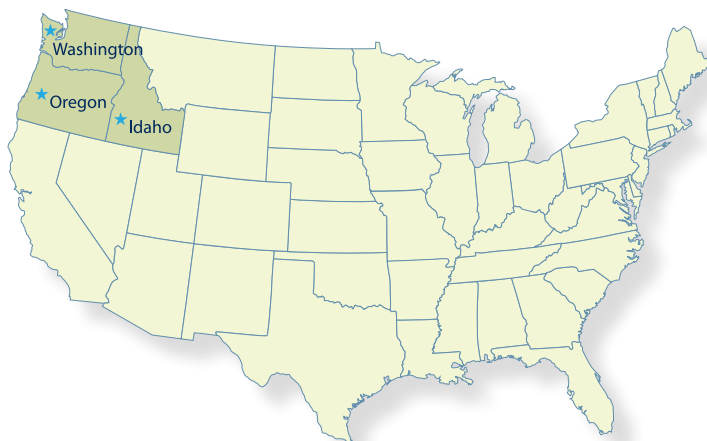
Weather and Harvest: The Pacific Northwest (PNW) had enough soil moisture at planting, and most areas received adequate rainfall during the winter and early spring. Generally cool temperatures prevailed during the early growing season with some limited periods of high temperatures. Dry conditions prevailed during wheat harvest with some localized rain. These weather conditions contributed to average or above average yield in most of the dryland farming areas in Idaho, Oregon, and Washington.

Survey and Analysis Methods: Wheat quality testing and data analyses were conducted by the Wheat Marketing Center (WMC), Portland, Oregon. Laboratory testing was conducted according to either American Association of Cereal Chemists Approved Methods (11th Edition) or Wheat Marketing Center Standard Methods. Survey samples were collected from producers under the management of the National Agricultural Statistics Services, USDA, and represent a statistical sampling of the crop. USDA's Federal Grain Inspection Service graded and tested wheat protein. The wheat commissions of Idaho, Oregon, and Washington, U.S. Wheat Associates, Inc., and the U.S. Department of Agriculture supported this program.

Wheat and Grade Data: The test weight averages for the 2010 soft white (SW) of 59.6 lb/bu (78.5 kg/hl) and white club (WC) of 60.0 lb/bu (78.9 kg/hl) were both below 2009 averages. Other grading factors for SW and WC were similar to last year and the five-year averages. SW dockage remained the same at 0.7% while WC dockage increased by 0.3 points to 1.1%. Wheat moisture contents of SW and WC, both at 9.4%, were similar to last year and the five-year averages for SW, but higher than last year and five-year averages of 8.7% for WC.

SW protein content (12% mb) of 9.7% was lower than last year and the five-year averages, and WC protein (12% mb) of 10.3% was similar to last year and the five-year averages. Wheat ash contents were similar to last year and the five-year averages for SW and WC. Thousand kernel weights for both SW and WC were slightly heavier than last year and five-year averages. Kernel diameter values were similar to last year, but larger than five-year average. Falling number values (14% mb) were 337 seconds for SW and 338 seconds for WC, both of which were slightly higher than last year, but similar to the five-year average.

Flour, Dough and Baking Data: The 2010 crop Buhler Laboratory mill flour extractions for SW at 71.0% and for WC at 71.7% were higher than last year and the five-year averages. Flour protein contents (14% mb) were 8.5 and 8.7% for SW and WC, respectively. Flour ash contents for both SW and WC were higher than last year and five-year averages. Falling number values indicated sound flour samples for SW and WC. Amylograph peak viscosity values also indicated sound flour that were higher than last year, and similar to five-year



THREE STATES SURVEYED

Idaho • Oregon • Washington

average. Starch damage values for SW and WC were lower than last year and the five-year averages. Farinograph peak and stability times showed that both SW and WC had similar weak gluten properties with lower water absorptions than last year and the five-year averages. SW showed slightly longer alveograph L value than last year, but shorter than five-year average. WC displayed longer L values than last year and the five-year averages. This year's extensograph extensibility for SW was similar to last year and the five-year averages. WC extensibility was longer than last year and five-year averages. Sponge cake volume for SW of 1214 cc was significantly larger with a slightly higher score than last year and the five-year averages. The volume for WC of 1229 cc was also bigger than last year and the five-year averages. Cookie diameters for SW and WC were bigger than last year and the five-year averages. SW and WC cookie spread factors were significantly higher than last year.

Chinese Southern-Type Steamed Bread: Each flour was made into southern-type steamed bread and compared with a control flour. Specific volumes were higher for SW and WC than last year, but lower than the five-year average. Total scores were slightly higher than last year and the five-year average for SW, and similar to last year but slightly higher than the five-year average for WC.

EXPORT CARGO SURVEY

The PNW SW export cargo data show the results of analyses of individual subplot samples including 78 drawn from the 2008 crop and 47 from the 2009 crop (August 2009 through May 2010). Representative samples were selected from official Federal Grain Inspection Service samples. Grade data were the actual grades on the individual sublots. Milling and processing analyses were conducted by the Wheat Marketing Center.

PNW SOFT WHITE | OVERVIEW

Pacific Northwest Soft White Wheat Production

in major producing states (million metric tons)

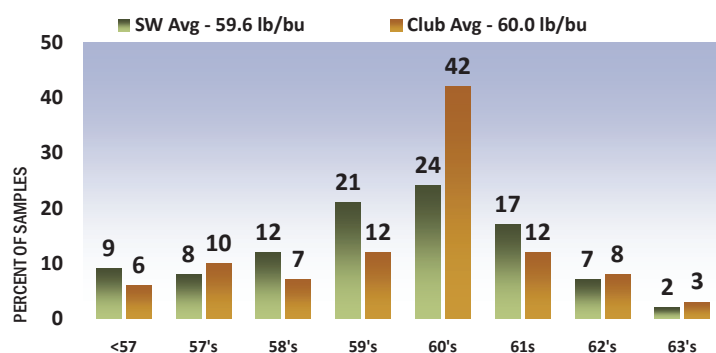
	2010		2009		2008		2007		2006	
	SW	CLUB	SW	CLUB	SW	CLUB	SW	CLUB	SW	CLUB
Washington	2.8	0.3	2.3	0.2	2.4	0.1	2.2	0.3	2.9	0.2
Oregon	1.5	0.0	1.2	0.0	1.3	0.0	1.1	0.0	1.4	0.0
Idaho	1.6	0.1	1.3	0.0	1.4	0.0	1.2	0.1	1.1	0.0
Three-state Total	5.9	0.4	4.9	0.2	5.1	0.2	4.5	0.4	5.4	0.2
Three-state Total Soft White Wheat	6.3		5.1		5.3		4.8		5.7	
Total US Soft White Wheat	6.9		5.7		6.1		5.3		6.4	

Based on USDA crop estimates of September 30, 2010.



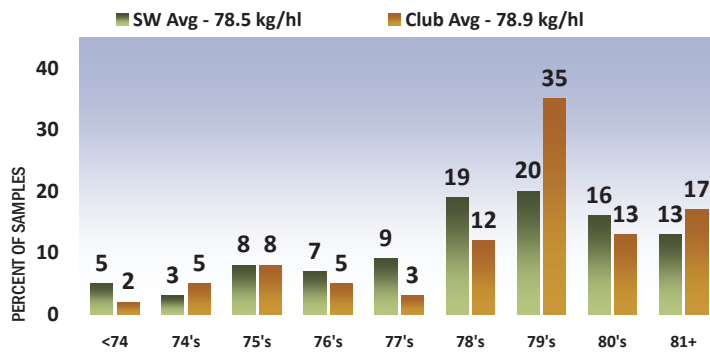
TEST WEIGHT

Pounds/Bushel



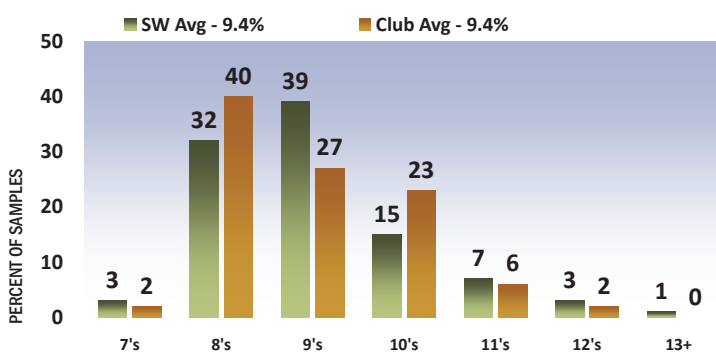
HECTOLITER WEIGHT

Kilograms/Hectoliter



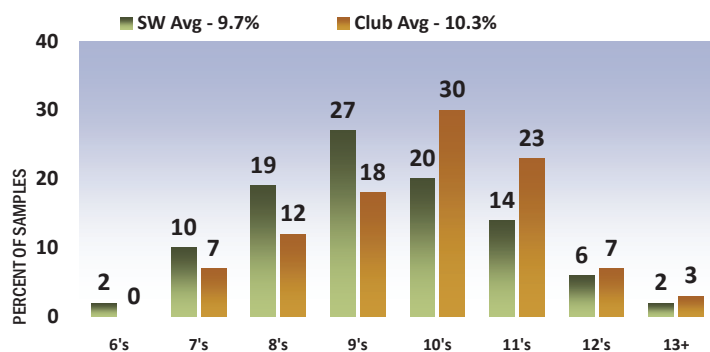
WHEAT MOISTURE

Percent



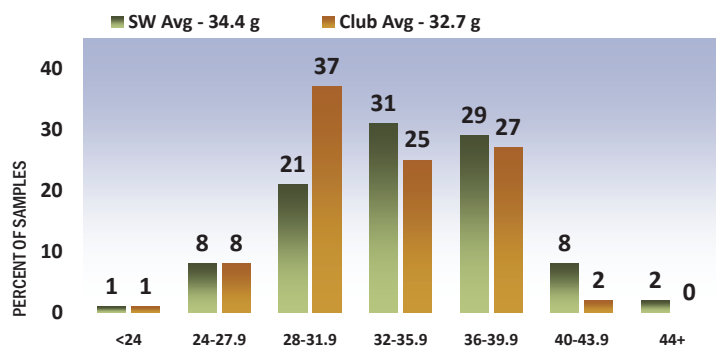
PROTEIN (12% MB)

Percent



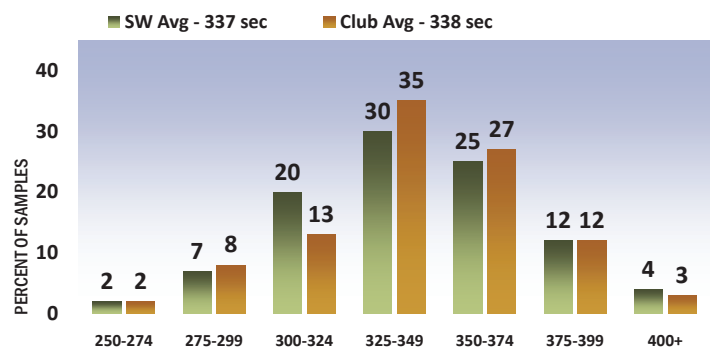
1000 KERNEL WEIGHT

Grams



FALLING NUMBER

Seconds

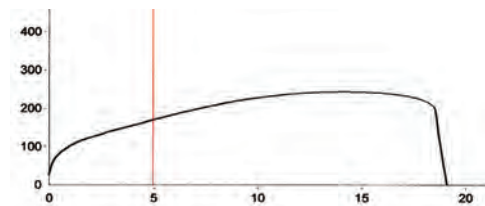
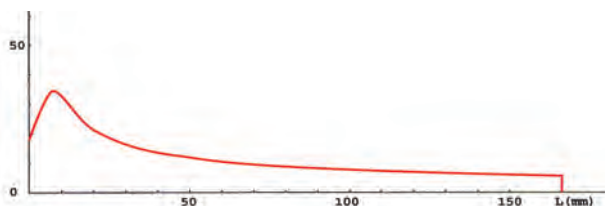
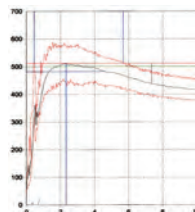


FARINOGRAMS

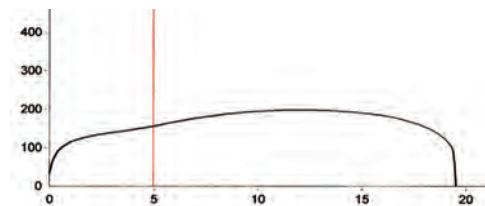
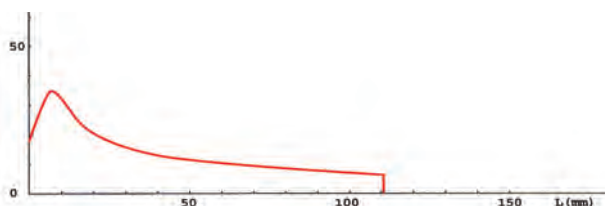
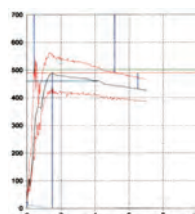
ALVEOGRAMS

EXTENSOGRAMS

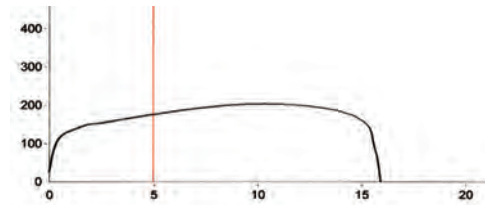
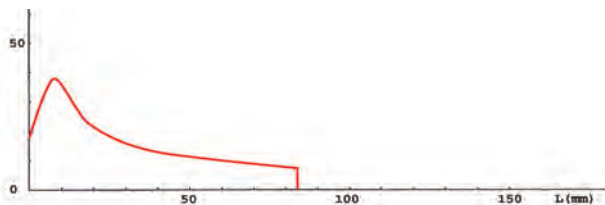
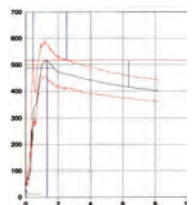
HIGH PROTEIN



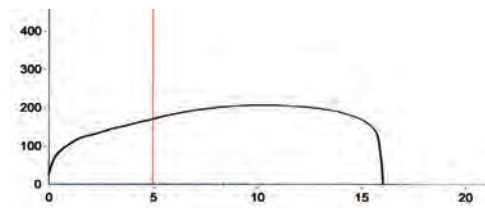
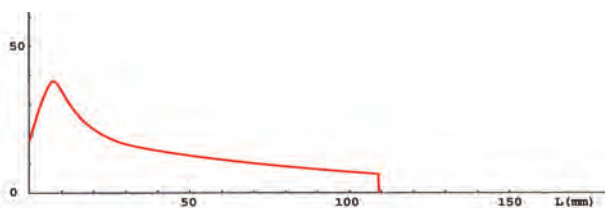
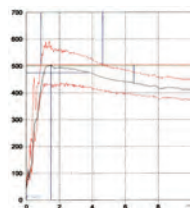
MEDIUM PROTEIN



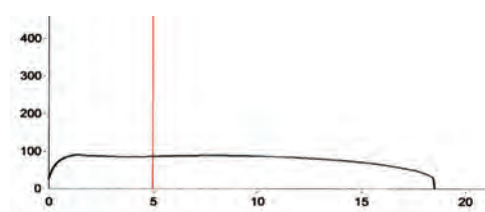
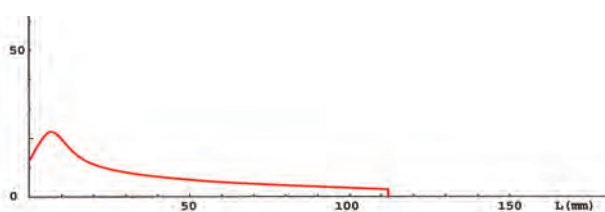
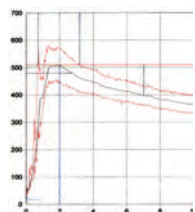
LOW PROTEIN



AVERAGE PROTEIN



CLUB



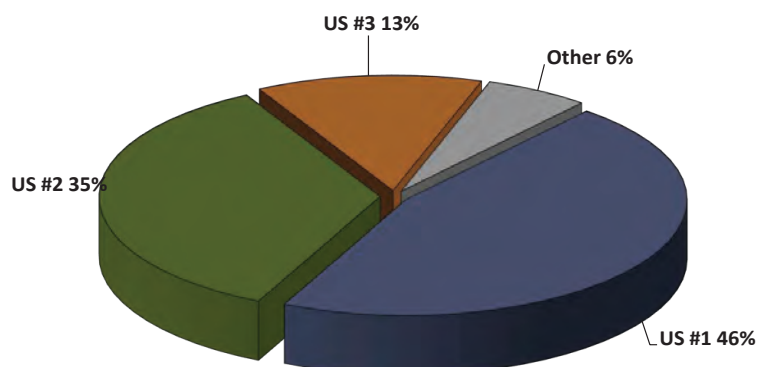
PNW SOFT WHITE | HARVEST DATA

Soft White	2010					2009		5-Year Average	
	Soft White By Protein*				Club				
	Low	Med	High	All	Average	SW	Club	SW	Club
Wheat Grade Data:									
Test Weight (lb/bu)	59.9	60.1	58.8	59.6	60.0	59.8	60.2	59.8	59.9
(kg/hl)	78.8	79.0	77.4	78.5	78.9	78.7	79.2	78.7	78.8
Damaged Kernels (%)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Foreign Material (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shrunken & Broken (%)	0.6	0.8	0.9	0.8	1.0	0.8	1.0	0.9	1.3
Total Defects (%)	0.7	0.9	1.0	0.9	1.1	0.9	1.1	1.0	1.5
Grade	2 SW	1 SW	2 SW	2 SW	1 WC	2 SW	1 WC	2 SW	1 WC
Wheat Non-Grade Data:									
Dockage (%)	0.7	0.8	0.8	0.7	1.1	0.7	0.8	0.7	0.8
Moisture (%)	9.6	9.4	9.3	9.4	9.4	9.3	8.7	9.2	8.7
Protein (%) 12%/0% moisture basis	8.1/9.2	9.7/11.0	11.6/13.2	9.7/11.0	10.3/11.7	10.3/11.7	10.2/11.6	10.4/11.8	10.3/11.7
Ash (%) 14%/0% moisture basis	1.34/1.56	1.36/1.58	1.44/1.67	1.38/1.60	1.29/1.50	1.37/1.59	1.29/1.50	1.39/1.62	1.31/1.52
1000 Kernel Weight (g)	36.7	34.3	32.1	34.4	32.7	33.1	31.4	33.8	30.6
Kernel Size (%) lg/md/sm	88/11/1	83/16/1	72/27/1	81/18/1	78/21/1	77/22/1	72/27/1	79/20/1	73/26/1
Single Kernel: Hardness	34.5	37.0	35.5	35.8	36.0	30.2	29.1	33.8	35.2
Weight (mg)	39.7	37.2	34.7	37.3	34.7	37.7	36.3	37.0	33.9
Diameter (mm)	2.85	2.74	2.66	2.75	2.63	2.76	2.68	2.61	2.47
Sedimentation (cc)	11.6	15.0	22.5	16.0	10.7	19.5	13.7	17.6	16.1
Falling Number (sec)	323	339	352	337	338	324	310	332	324
Flour Data:									
Lab Mill Extraction (%)	70.8	71.3	70.8	71.0	71.7	70.5	71.3	69.6	70.9
Color: L*	91.9	91.8	91.7	91.8	91.9	92.4	92.1	92.3	92.2
a*	-2.7	-2.6	-2.4	-2.6	-2.4	-2.4	-2.3	-2.4	-2.2
b*	8.9	8.8	8.5	8.7	8.0	7.8	7.2	7.9	7.5
Protein (%) 14%/0% moisture basis	7.0/8.1	8.4/9.8	10.3/12.0	8.5/9.9	8.7/10.1	8.9/10.3	9.0/10.5	8.8/10.2	8.8/10.2
Ash (%) 14%/0% moisture basis	0.50/0.58	0.49/0.57	0.55/0.64	0.51/0.59	0.48/0.56	0.46/0.53	0.47/0.55	0.42/0.49	0.42/0.49
Wet Gluten (%)	17.0	22.1	26.5	21.7	18.7	24.0	15.0	23.0	19.3
Gluten Index	83.8	63.5	75.9	73.3	47.4	65.8	56.9	58.2	24.6
Falling Number (sec)	350	380	382	371	349	339	382	341	349
Amylograph Viscosity 65 g (BU)	488	502	538	508	554	425	417	519	542
Starch Damage (%)	4.5	3.4	3.2	3.7	3.3	6.1	6.2	4.6	4.3
Solvent Retention Capacity (%)									
Water/50% Sucrose	49/88	47/91	47/94	47/91	43/84	60/118	57/113	55/110	48/101
5% Lactic Acid/5% Na ₂ CO ₃	84/71	91/71	102/69	92/70	73/61	100/93	86/88	105/83	83/77
Dough Properties:									
Farinograph: Peak Time (min)	1.4	1.5	2.4	1.5	2.0	1.7	1.3	1.7	1.3
Stability (min)	1.7	4.3	4.7	3.7	2.1	3.8	2.1	4.3	2.0
Absorption (%)	52.2	52.1	53.3	52.5	50.7	55.8	56.0	53.6	52.8
Alveograph: P (mm)	42	38	39	42	24	52	58	42	33
L (mm)	83	111	167	110	112	100	56	121	79
P/L Ratio	0.51	0.34	0.23	0.38	0.21	0.52	1.04	0.35	0.46
W (10-4 joules)	88	97	132	106	53	125	81	115	53
Extensograph: Resistance (BU)	203	197	243	206	89	196	123	224	110
(45 min) Extensibility (cm)	15.9	19.6	19.1	16.1	18.6	15.8	15.3	16.7	15.7
Area (sq cm)	49	57	66	49	26	45	28	55	25
Baking Evaluation:									
Sponge Cake: Volume (cc)	1252	1199	1192	1214	1229	1147	1177	1176	1208
Score	53	51	49	51	48	49	52	50	50
Cookie: Diameter (cm)	9.1	8.8	8.8	8.9	9.5	8.0	8.2	8.1	8.5
Spread Factor (width/height)	11.3	10.9	10.6	10.9	13.4	7.7	8.8		
Chinese Southern-Type Steamed Bread Evaluation:									
Specific Volume (ml/g)	2.1	2.1	2.4	2.2	2.3	2.0	2.2	2.5	2.6
Total Score	66.3	67.8	69.5	67.8	66.3	65.6	66.5	67.3	65.6
% of Area Production:	31	41	28	100	100	100	100	100	100

* Low: Less than 9.0%; Medium: 9.0 - 10.5%; High: Greater than 10.5%

Soft White	2009	2008
Wheat Grade Data:		
Test Weight (lb/bu)	61.4	60.8
(kg/hl)	80.8	80.0
Damaged Kernels (%)	0.1	0.2
Foreign Material (%)	0.1	0.1
Shrunken & Broken (%)	0.8	1.0
Total Defects (%)	1.0	1.3
Grade	1 SW	1 SW
Wheat Non-Grade Data:		
Dockage (%)	0.3	0.3
Moisture (%)	9.2	9.5
Protein (%) 12%/0% moisture basis	10.2/11.6	10.7/12.1
Ash (%) 14%/0% moisture basis	1.31/1.52	1.40/1.63
1000 Kernel Weight (g)	36.4	37.7
Kernel Size (%) lg/md/sm	82/18/0	77/22/1
Single Kernel: Hardness	34.1	34.9
Weight (mg)	35.3	35.3
Diameter (mm)	2.46	2.45
Sedimentation (cc)	16.2	17.5
Falling Number (sec)	349	340
Flour Data:		
Lab Mill Extraction (%)	70.7	70.9
Color: L*	91.9	92.3
a*	-2.5	-2.3
b*	8.2	7.8
Protein (%) 14%/0% moisture basis	8.6/10.0	9.0/10.5
Ash (%) 14%/0% moisture basis	0.39/0.45	0.42/0.49
Wet Gluten (%)	21.8	23.5
Gluten Index	80.7	72.4
Falling Number (sec)	377	366
Amylograph Viscosity 65 g (BU)	474	495
Starch Damage (%)		
Solvent Retention Capacity (%)		
Water/50% Sucrose		
5% Lactic Acid/5% Na ₂ CO ₃		
Dough Properties:		
Farinograph: Peak Time (min)	1.5	1.8
Stability (min)	3.8	3.9
Absorption (%)	52.4	52.9
Alveograph: P (mm)	43	43
L (mm)	128	132
P/L Ratio	0.33	0.32
W (10-4 joules)	121	115
Extensograph: Resistance (BU)		
(45 min) Extensibility (cm)		
Area (sq cm)		
Baking Evaluation:		
Sponge Cake: Volume (cc)	1193	1166
Score	49	49
Cookie: Diameter (cm)	8.4	8.1
Spread Factor (width/height)		
Chinese Southern-Type Steamed Bread Evaluation:		
Specific Volume (ml/g)		
Total Score		
Sample Count:	47	78

SW GRADE DISTRIBUTION



ABOUT SOFT WHITE WHEAT

Low protein, low moisture wheat. Soft endosperm, white bran, weak gluten. Used in pastries, cakes, biscuits, crackers, flat breads, Asian-style noodles and snack foods. Can also be used for blending.

HARVEST SURVEY

Weather and Harvest: Soft red winter wheat (SRW) is grown over a wide area of the eastern United States. Planted area was down sharply in the fall of 2009, to record lows in four states, as a wet fall delayed harvesting of row crops and prevented planting of wheat. Large carry-in stocks and prices favoring other crops also discouraged SRW planting. Ample moisture was favorable for development of wheat that did get planted. The crop was generally in very good condition by early spring. Unusually heavy, widespread rainfall in May and early June followed by unusually hot temperatures favored diseases in some areas and adversely affected quality. Rain delayed the start of harvest, but harvest then proceeded more rapidly than the five-year average pace, partly because of the small planted area. Harvesting was largely complete in the East Coast states by early July and throughout the survey area by mid-July.

Survey Methods: Sample collection and analysis were conducted by CII Laboratory Services, Kansas City, Missouri. For 2010, 347 samples were collected from elevators in 18 reporting areas in Arkansas, Illinois, Indiana, Maryland, Missouri, Ohio, North Carolina, Virginia and Kentucky. Samples were collected at two different times reflecting early and late harvest. Test weight, moisture, protein, thousand kernel weight, wheat ash and falling number were determined on 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 “Composite Average”, “East Coast” and “Gulf Ports” values. East Coast-tributary states include Maryland, North Carolina and Virginia, while the others are considered Gulf tributary. The Analysis Methods section of this booklet identifies the test methods used.

Wheat and Grade Data: The adverse growing conditions are reflected in the low average grade of #3 SRW, mainly from low test weights. Average test weight of 57.9 lb/bu (76.2 kg/hl) is 0.3 lb/bu (0.4 kg/hl) above 2009 but still well below the five-

year average of 59.4 lb/bu (78.1 kg/hl). Average grade and test weight in the East Coast states are higher than Gulf values and are similar to the five-year averages. Both Gulf and East Coast areas have damage higher than the five-year averages, though lower than the 2009 values. Protein content is slightly above last year and the five-year average for the Gulf states and a full percentage point above the five-year average in the East Coast states. DON values are below the five-year average in the East Coast states, but are well above the five-year average for the Gulf states. Average falling number values are all above 300.

Flour and Baking Data: Buhler laboratory mill flour extraction is above the 2009 value and one percentage point higher than the five-year average despite lower than average test weight. Farinograph peak and stability times are all above last year and similar to or above the five-year average, indicating good processing qualities. The alveograph W value is similar to the five-year average for the East Coast states, but below last year and the five-year average in Gulf samples. Loaf volume is similar to last year and above the five-year average.

Summary: The 2010 SRW crop was affected by excessively heavy rainfall in most areas followed by unusually high temperatures which resulted in increased disease and damage, reduced test weight, and above average incidence of DON in the Gulf states. However, milling and farinograph quality are similar to or better than the five-year averages and protein content is higher than average. Buyers will need to craft specifications carefully to be sure that they receive qualities that meet their needs either for traditional soft wheat products or blending with stronger wheat.

EXPORT CARGO SURVEY

The export cargo data represents 123 individual subplot samples for crop years 2010 and 2009 from Gulf of Mexico and East Coast ports. Samples were selected from official Federal Grain Inspection Service samples, and grade data are the official grades on the individual subplots. Milling and baking analyses were conducted by CII Laboratory Services.

ABOUT SOFT RED WINTER WHEAT

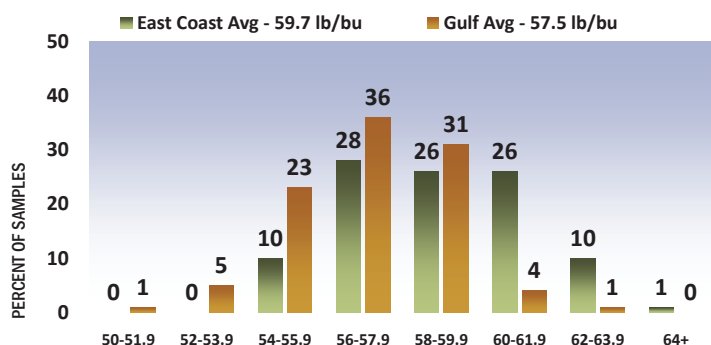
Low protein content, soft endosperm, red bran, weak gluten. Used in pastries, cakes, cookies, crackers, pretzels, and flat breads. Can also be used for blending.

NINE OF SIXTEEN STATES SURVEYED

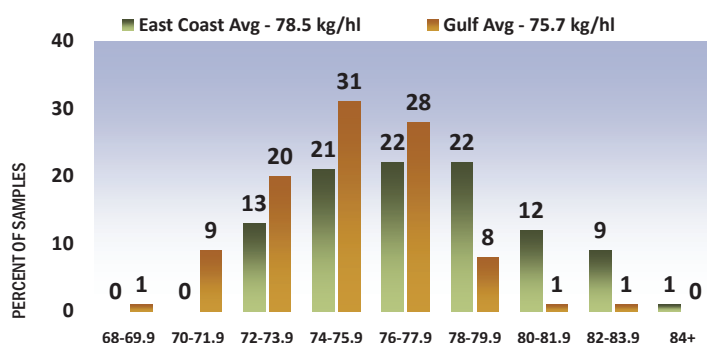
Arkansas • Illinois • Indiana • Kentucky • Maryland
Missouri • North Carolina • Ohio • Virginia



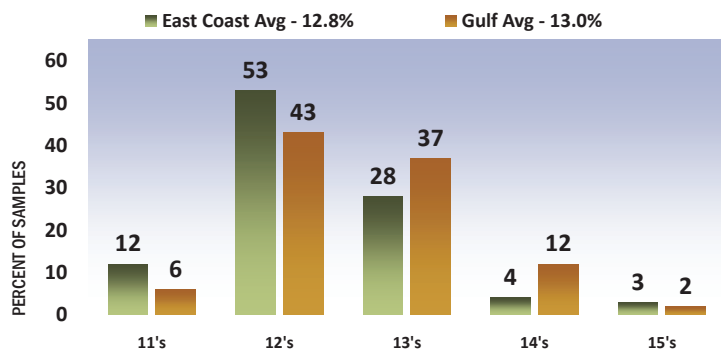
TEST WEIGHT | Pounds/Bushel



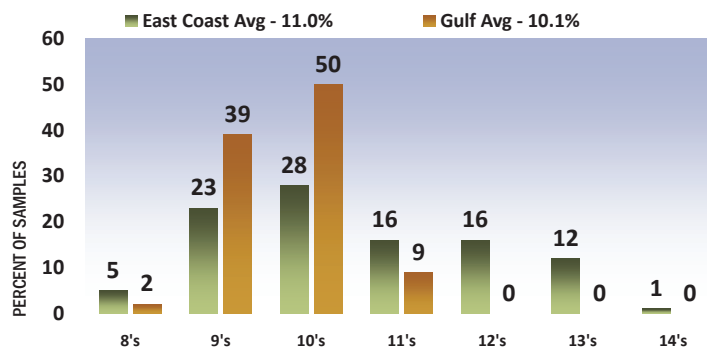
HECTOLITER WEIGHT | Kilograms/Hectoliter



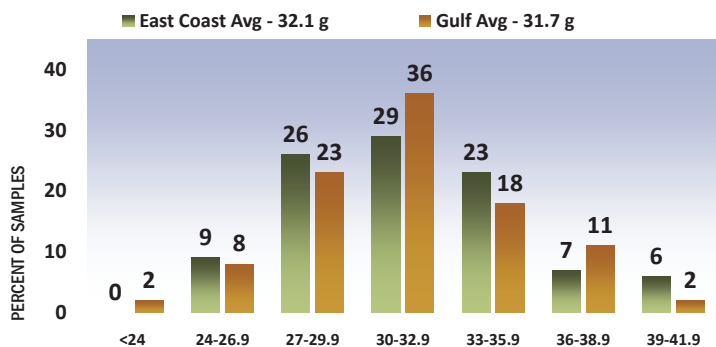
WHEAT MOISTURE | Percent



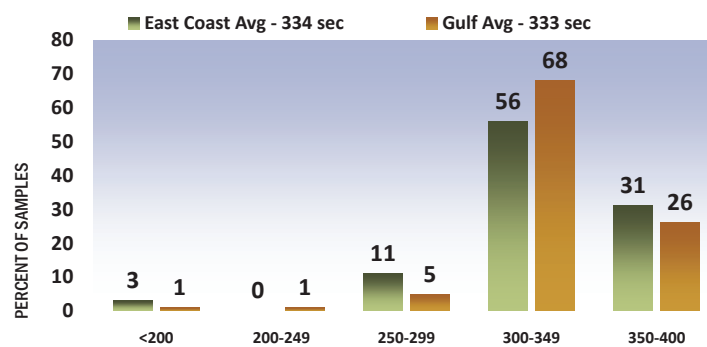
PROTEIN (12% MB) | Percent



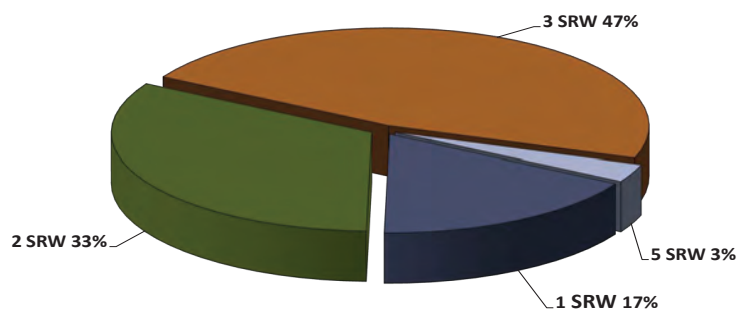
1000 KERNEL WEIGHT | Grams



FALLING NUMBER | Seconds



GRADE DISTRIBUTION*



*Based on 30 composite samples.



SOFT RED WINTER | HARVEST DATA

Soft Red Winter	Composite Average			East Coast*			Gulf Ports*		
	2010	2009	5-Year Avg	2010	2009	5-Year Avg	2010	2009	5-Year Avg
Wheat Grade Data:									
Test Weight (lb/bu)	57.9	57.6	59.4	59.7	59.2	59.8	57.5	57.3	59.3
(kg/hl)	76.2	75.8	78.1	78.5	77.8	78.7	75.7	75.4	78.0
Damaged Kernels (%)	1.7	2.4	0.9	1.5	1.8	1.1	1.7	2.5	0.9
Foreign Material (%)	0.4	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.0
Shrunken & Broken (%)	0.6	0.7	0.6	0.6	0.6	0.5	0.6	0.8	0.7
Total Defects (%)	2.6	3.1	1.6	2.2	2.4	1.7	2.7	3.2	1.6
Grade	3 SRW	3 SRW	2 SRW	2 SRW	2 SRW	2 SRW	3 SRW	3 SRW	2 SRW
Wheat Non-Grade Data:									
Dockage (%)	0.9	0.8	0.9	1.2	1.1	0.8	0.8	0.8	0.9
Moisture (%)	12.9	12.8	13.0	12.8	13.1	13.0	13.0	12.8	13.0
Protein (%) 12%/0% moisture basis	10.3/11.7	10.0/11.4	9.9/11.3	11.0/12.5	10.9/12.4	10.0/11.4	10.1/11.5	9.8/11.1	9.9/11.3
Ash (%) 14%/0% moisture basis	1.55/1.81	1.56/1.81	1.53/1.78	1.53/1.77	1.55/1.80	1.47/1.70	1.56/1.81	1.57/1.83	1.55/1.80
1000 Kernel Weight (g)	31.8	30.8	33.4	32.1	32.9	34.9	31.7	30.4	33.0
Kernel Size (%) lg/md/sm	80/19/1	80/19/1	83/16/1	77/22/1	83/16/1	86/13/1	81/18/1	80/19/1	83/16/1
Single Kernel: Hardness	20.6	20.1	18.8	24.7	25.9	19.4	19.6	18.9	18.8
Weight (mg)	30.6	30.6	30.6	30.9	32.2	34.1	30.5	30.2	29.8
Diameter (mm)	2.25	2.26	2.16	2.23	2.35	2.36	2.25	2.25	2.11
Sedimentation (cc)	11.9	12.3	13.1	16.2	16.7	14.5	11.0	11.4	12.8
Falling Number (sec)	333	325	334	334	322	327	333	325	337
DON (ppm)	2.0	1.8	0.8	0.4	1.5	0.7	2.4	1.9	0.9
Flour Data:									
Lab Mill Extraction (%)	70.0	67.2	69.0	68.2	66.9	68.6	70.3	67.3	69.1
Color: L*	93.1	93.3	93.4	93.0	93.2	93.5	93.1	93.3	93.4
a*	-3.2	-3.1	-3.0	-3.1	-3.0	-3.1	-3.2	-3.1	-3.0
b*	8.1	8.3	8.3	8.1	7.9	8.1	8.1	8.4	8.3
Protein (%) 14%/0% moisture basis	8.6/10.0	8.2/9.5	8.3/9.6	9.3/10.8	8.8/10.3	8.4/9.7	8.5/9.9	8.0/9.3	8.2/9.6
Ash (%) 14%/0% moisture basis	0.43/0.51	0.45/0.52	0.43/0.50	0.43/0.50	0.44/0.51	0.43/0.50	0.44/0.51	0.45/0.52	0.43/0.50
Wet Gluten (%)	23.3	21.4	21.8	25.3	22.9	20.5	22.8	21.1	22.2
Gluten Index	85.1	69.4	79.1	89.0	74.7	84.8	84.2	68.3	77.7
Falling Number (sec)	354	314	334	356	310	327	353	315	337
Amylograph Viscosity 65 g (BU)	717	553	598	673	477	512	727	568	619
Starch Damage (%)	4.4	4.4	4.3	4.7	4.4	4.3	4.3	4.4	4.3
Solvent Retention Capacity (%)									
Water/50% Sucrose	56/107	59/115	55/108	56/109	59/118	56/112	55/104	58/110	54/105
5% Lactic Acid/5% Na ₂ CO ₃	116/81	117/87	110/79	119/81	122/89	113/81	113/80	114/87	107/78
Dough Properties:									
Farinograph:									
Peak Time (min)	1.6	1.5	1.5	2.0	1.8	1.7	1.6	1.4	1.5
Stability (min)	2.9	2.6	2.9	3.3	2.8	3.0	2.9	2.5	2.9
Absorption (%)	51.8	51.3	52.0	52.3	52.8	52.6	51.7	51.0	52.0
Alveograph: P (mm)	35	41	40	38	50	46	34	39	39
L (mm)	88	83	89	106	85	84	83	83	90
P/L Ratio	0.40	0.50	0.45	0.36	0.59	0.55	0.41	0.48	0.43
W (10-4 joules)	83	90	94	103	115	106	79	85	91
Baking Evaluation:									
Crumb Grain	5.2	5.2	5.3	5.9	5.8	5.6	5.1	5.1	5.3
Crumb Texture	5.3	5.2	5.5	5.9	5.6	5.6	5.1	5.1	5.5
Loaf Volume (cc)	733	733	716	744	737	715	730	732	717
Cookie Spread Ratio	9.8	9.0	8.7	8.9	8.1	8.3	9.9	9.2	8.8
% of Area Sampled:	100%			18%			82%		

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

Soft Red Winter	2010	2009
Wheat Grade Data:		
Test Weight (lb/bu)	58.3	58.4
(kg/hl)	76.7	76.8
Damaged Kernels (%)	2.7	2.9
Foreign Material (%)	0.1	0.1
Shrunken & Broken (%)	0.9	0.8
Total Defects (%)	3.8	3.9
Grade	2 SRW	2 SRW
Wheat Non-Grade Data:		
Dockage (%)	0.8	0.8
Moisture (%)	12.5	12.4
Protein (%) 12%/0% moisture basis	10.2/11.6	10.0/11.4
Ash (%) 14%/0% moisture basis	1.56/1.81	1.57/1.83
1000 Kernel Weight (g)	29.4	30.1
Kernel Size (%) lg/md/sm	79/19/2	82/17/1
Single Kernel: Hardness		20.8
Weight (mg)		31.1
Diameter (mm)		2.29
Sedimentation (cc)	12.1	11.4
Falling Number (sec)	349	346
DON (ppm)		1.0
Flour Data:		
Lab Mill Extraction (%)	70.7	69.8
Color: L*	92.9	93.1
a*	-2.9	-3.0
b*	8.0	7.4
Protein (%) 14%/0% moisture basis	8.7/10.1	8.4/9.8
Ash (%) 14%/0% moisture basis	0.41/0.48	0.46/0.54
Wet Gluten (%)	22.9	21.5
Gluten Index	93.8	86.8
Falling Number (sec)	383	377
Amylograph Viscosity 65 g (BU)	727	591
Starch Damage (%)		
Solvent Retention Capacity (%)		
Water/50% Sucrose		
5% Lactic Acid/5% Na ₂ CO ₃		
Dough Properties:		
Farinograph:		
Peak Time (min)	1.7	1.3
Stability (min)	3.5	2.3
Absorption (%)	52.3	52.5
Alveograph: P (mm)		
L (mm)	41	52
P/L Ratio	81	72
P/L Ratio	0.51	0.72
W (10 ⁻⁴ joules)	102	114
Baking Evaluation:		
Crumb Grain	5.4	5.3
Crumb Texture	6.1	5.5
Loaf Volume (cc)	722	703
Cookie Spread Ratio	8.9	8.3
Sample Count:	17	106

Soft Red Winter Production

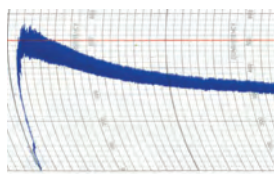
in major producing states (million metric tons)

	2010	2009	2008	2007	2006
Alabama	0.2	0.3	0.4	0.1	0.1
Arkansas	0.2	0.5	1.5	0.8	0.5
Georgia	0.1	0.3	0.6	0.3	0.2
Illinois	0.4	1.2	1.9	1.4	1.6
Indiana	0.4	0.8	1.1	0.6	0.9
Kentucky	0.4	0.6	0.9	0.3	0.6
Louisiana	0.1	0.3	0.6	0.3	0.1
Maryland	0.2	0.3	0.4	0.3	0.2
Michigan	0.6	0.7	0.8	0.6	0.8
Mississippi	0.1	0.2	0.8	0.5	0.1
Missouri	0.3	0.9	1.5	1.0	1.3
North Carolina	0.4	0.8	1.2	0.5	0.7
Ohio	1.2	1.9	2.0	1.3	1.8
South Carolina	0.1	0.2	0.3	0.1	0.2
Tennessee	0.3	0.5	0.9	0.3	0.3
Virginia	0.2	0.3	0.5	0.4	0.3
16-State Total	5.5	9.7	15.3	8.6	9.6
Total SRW Production	6.5	11.0	16.7	9.6	10.6

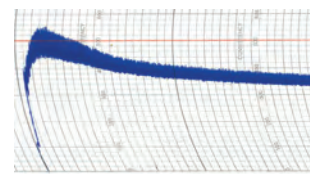
Based on USDA crop estimates of September 30, 2010.

FARINOGRAMS

GULF

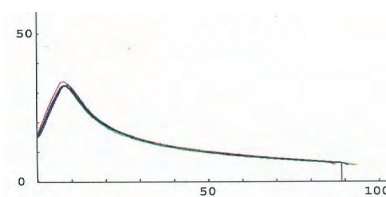


EAST COAST

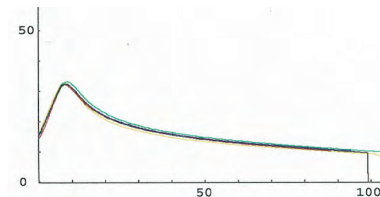


ALVEOGRAMS

GULF



EAST COAST



ANALYSIS METHODS

The harvest samples and cargo samples for each class were evaluated using 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."

WHEAT AND GRADE DATA

Grade: Official U.S. Standards for Grain.

Dockage: Official USDA procedure using the Carter Dockage Tester.

Moisture: HRS, Durum - Motomco Moisture Meter and AACC 44-15A (Air Oven Method); SRW - AACC 44-15A; HRW - NIR Method; SW, HW - Official US Standards for grain method using Dickey-John Grain Analysis Computer 2100.

Test Weight: AACC 55-10; test weight is mathematically converted to hectoliter weight: for durum - $\text{kg/hl} = \text{lb/bu} \times 1.292 + 0.630$, for other wheats - $\text{kg/hl} = \text{lb/bu} \times 1.292 + 1.419$.

Protein: HRW - AACC 39-11 (NIR Method). SW, HW - Official USDA method using Foss Infratec Analyzer. All other classes - AACC 46-30 (Dumas Combustion Nitrogen Analysis method).

Single Kernel Characterization: Perten method using Perten SKCS 4100.

Sedimentation: HRS, HRW (Midwestern), SRW, SW, HW - AACC 56-61A; Durum - AACC 56-70.

1000 Kernel Weight: HRS, Durum, SRW - based on a 10-gram sample of clean wheat counted by an electronic counter. SW, HW - based on three 100-kernel sample weight expressed on a 14% moisture basis. HRW - calculated from SKCS data by taking average kernel weight times 1000.

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 and 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 which do not pass through the No. 7 screen are classified as "Large." Kernels passing through the No. 7 screen but not the No. 9 screen are "Medium." Kernels passing through the No. 9 screen are "Small."

FLOUR DATA

Laboratory Milling Extraction: Samples were cleaned and tempered according to AACC 26-10A. All samples within each class other than California HRW were milled with standardized 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: Minolta Method using Minolta Chroma Meter CR-110 for HRW and SRW, CR-310 for HRS, or CR-410 for 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: HRW - AACC 39-11 (NIR Method). All other classes - AACC 46-30 (Dumas Combustion Nitrogen Analysis method).

Wet Gluten and Gluten Index: HRS, SRW, HW, HRW (Midwestern) - AACC 38-12A; SW - AACC 38-12A (water reduced from 4.8 to 4.2 ml); 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 (California) is reported on 14% moisture basis. HRW (California) 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. HRW, HRS (65g), SRW, SW, HW - AACC 22-10 modified to use 65g flour (14% moisture basis) and 450ml distilled water with paddle (HRS) or pins (other classes).

Extensograph: AACC 54-10, modified 45 min. and 135 min. rest for HRS, HRW, HW; 45 min. rest for SW.

Starch Damage: HRW - (SDmatic, similar to AACC 76-33.), HRS, SRW, Durum - AACC 76-30A. SW, HW - iodine absorption by Chopin SDMatic instrument.

Solvent Retention Capacity (SRC): AACC 56-11.

SEMOLINA DATA

Laboratory Milling Extraction: Midwestern 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 (Dumas Combustion Nitrogen Analysis method).

Wet Gluten and Gluten Index: AACC 38-12 Glutomatic procedure.

Specks: Sample is pressed under 3 inch x 4 inch glass plate,

and the specks within one-inch square marked on the plate are counted. Average of three determinations is expressed as specks per 10 square inches.

Mixograph: 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 classification number, the stronger the curve type.

BAKING, NOODLE, STEAMED BREAD AND SPAGHETTI DATA

HRW: AACC 10-10B (Pup Loaf Method). 100-g pin mixer with head speed of 100-125 rpm was used to mix 100 g flour at 14% mb with optimized water absorption and other ingredients (6% sugar, 3% shortening, 1.5% salt, 1.0% Instant dry yeast, 50 ppm ascorbic acid, and 0.25% mated barley flour) to optimum development. The dough was fermented for 60 min with two punches, then molded and panned, and proofed for 60 min before baking at 425 F for 18 min. Loaf volume is measured immediately after baking by rapeseed displacement. Crumb grain and texture were evaluated using a scale of 0 to 6 points, which in this booklet has been mathematically converted to a scale of 1-10. **California HRW only** - AACC 10-10B producing two loaves per batch using wet compressed yeast, malt flour, 45 ppm ascorbic acid, and 120 min. fermentation. Loaf volume is measured immediately after baking. Scoring of grain and texture for all is on a scale of 1-10 with higher numbers indicating preferred quality attributes.

SRW: AACC 10-10B (Pup Loaf Method) producing two loaves per batch using wet compressed yeast and ascorbic acid. After mixing, the dough is divided into two equal portions, fermented for 160 min., molded and panned in "pup loaf" pans before proofing and baking. Loaf volume is measured immediately after baking by rapeseed displacement.

SRW Cookie Spread Ratio - AACC 10-50D.

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

SW: Cookie diameter - AACC 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 16-50.

HW Baking: AACC 10-10B with 180 min fermentation.*

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 100%, salt 1.2%, and distilled water 28%. The Chinese wet noodle formula was: flour 100%, salt 2%, K_2CO_3 0.45%, Na_2CO_3 0.45%, and distilled water 32%. 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 270° 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. Noodle 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 Stable Micro Systems 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.

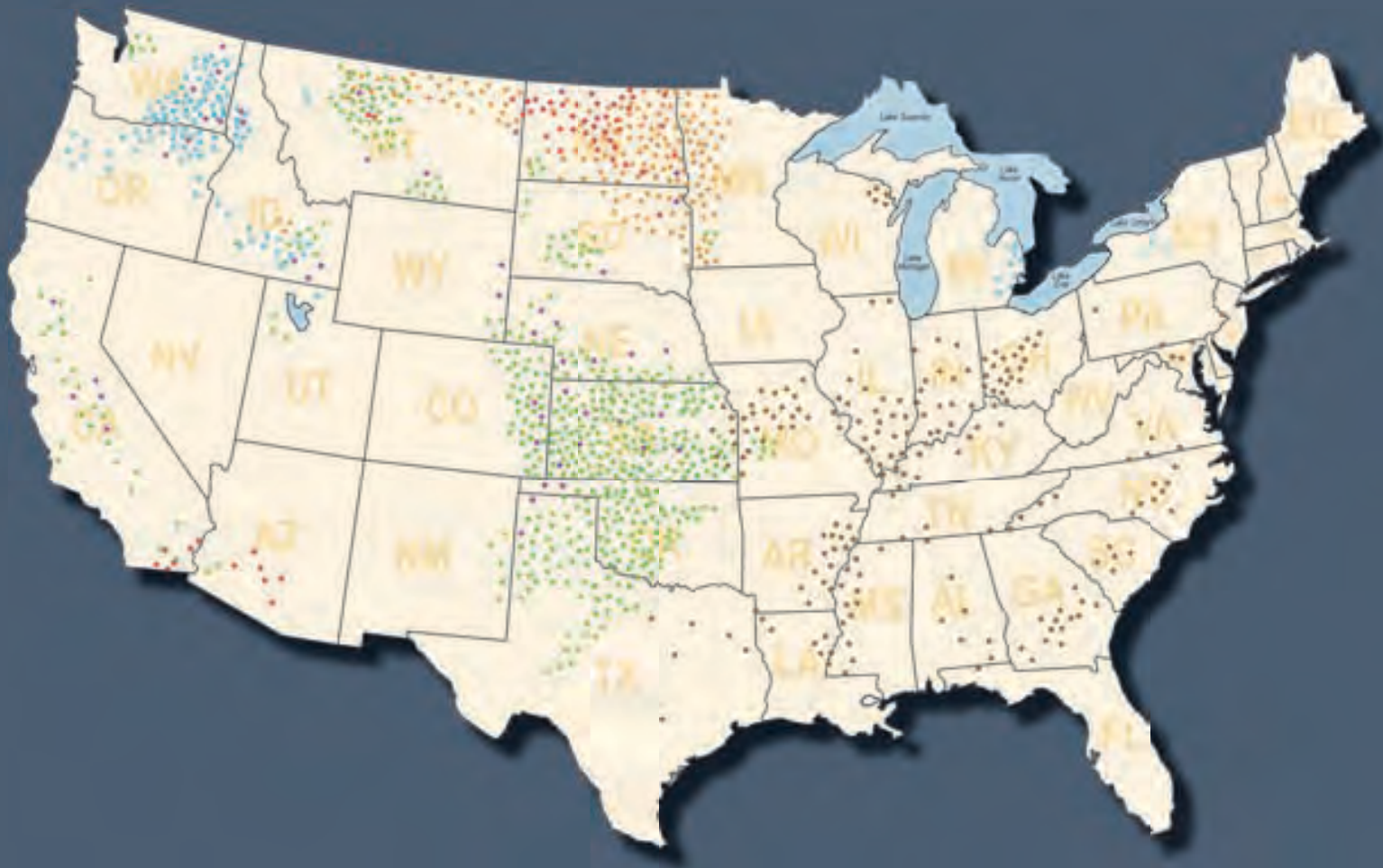
Chinese Steamed Bread: Two types of steamed breads were prepared: Chinese southern-type from each of the SW and club wheat flours and Asian steamed breads from each of the HW flours. The Chinese southern-type formula was: flour 100%, sugar 15%, shortening 4%, baking powder 1.2%, instant yeast 0.8%, nonfat dry milk powder 3% and water 39-43%. The Asian-type formula was: flour 100%, instant yeast 1.5%, sugar 12%, shortening 2%, and water 42.5-45%. Yeast was dissolved in water before use. All steamed breads were prepared using no-time dough methods (WMC protocols). The Total 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.

* Finished Product Volume Measurement for SW sponge cake and steamed bread and HW bread and steamed bread: Laser light using a Tex Vol Instrument (BVM-L370).

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

U.S. wheat...the world's most reliable choice



HARD RED WINTER



Medium to high protein, medium hard endosperm, red bran, medium gluten content and mellow gluten. Used in pan breads, Asian noodles, hard rolls, flatbreads and general-purpose flour.



HARD RED SPRING



Highest protein content, hard endosperm, red bran, strong gluten, high water absorption. Used in pan breads, hearth breads, rolls, croissants, bagels, hamburger buns, pizza crust and for blending.



SOFT RED WINTER



Low protein content, soft endosperm, red bran, weak gluten. Used in pastries, cakes, cookies, crackers, pretzels, and flat breads. Can also be used for blending.



DURUM



Hardest of all wheats, high protein content, yellow endosperm, white bran. Used to make pasta, couscous, and some Mediterranean breads.



HARD WHITE



Medium to high protein content, hard endosperm, white bran. Used in Asian noodles, whole wheat or high extraction flour applications, pan breads and flat breads.



SOFT WHITE



Low protein, low moisture wheat. Soft endosperm, white bran, weak gluten. Used in pastries, cakes, biscuits, crackers, flat breads, Asian-style noodles and snack foods.



WORLD HEADQUARTERS
 3103 10th Street, North, Suite 300
 Arlington, VA 22201
 TELEPHONE (202) 463-0999
 FAX (703) 524-4399
 E-MAIL info@uswheat.org

WEST COAST U.S. OFFICE
 1200 NW Naito Parkway, Suite 600
 Portland, OR 97209
 TELEPHONE (503) 223-8123
 FAX (503) 223-5026
 E-MAIL infoportland@uswheat.org

	PHONE	FAX	EMAIL
BEIJING	(86 10) 6505-3866	(86 10) 6505-5138	InfoBeijing@uswheat.org
PROVIDING SERVICES TO: China			
CAIRO (Regional Office)	(202) 2380-3162	(202) 2380-3138	InfoCairo@uswheat.org
PROVIDING SERVICES TO: Algeria, Bahrain, Burundi, Cyprus, Djibouti, Egypt, Eritrea, Ethiopia, Iraq, Iran, Jordan, Kenya, Kuwait, Lebanon, Libya, Mauritania, Mauritius, Morocco, Oman, Rwanda, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tanzania, Tunisia, Turkey, United Arab Emirates, Uganda, Yemen			
CAPE TOWN (Regional Office)	(27 21) 418-3710	(27 21) 419-0400	InfoCapeTown@uswheat.org
PROVIDING SERVICES TO: Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Chad, Congo, Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia Conakry, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Sao Tome/Principe, Senegal, Sierra Leone, South Africa, St. Helena, Swaziland, Togo, Zaire, Zambia, Zimbabwe			
CASABLANCA	(212) 522 74-1459	(212) 522 74-1460	InfoCasablanca@uswheat.org
PROVIDING SERVICES TO: Algeria, Libya, Mauritania, Morocco, Tunis			
HONG KONG (Regional Office)	(852) 2890-2815	(852) 2576-2676	InfoHongKong@uswheat.org
PROVIDING SERVICES TO: China, Mongolia			
LAGOS	(234 1) 261-0657	(234 1) 261-0657	mtalabi@uswheat.org
PROVIDING SERVICES TO: Nigeria			
MANILA	(63 2) 818-4610	(63 2) 815-4026	InfoManila@uswheat.org
PROVIDING SERVICES TO: Philippines			
MEXICO CITY (Regional Office)	(5255) 5-202-2075	(5255) 2-623-1109	InfoMexico@uswheat.org
PROVIDING SERVICES TO: Anguilla, Antigua-Barbuda, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, French Guiana, French West Indies, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Leeward-Windward Islands, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Puerto Rico, Saint Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad-Tobago, Turks & Caicos Islands, Venezuela, Virgin Islands (British)			
MOSCOW	(7 495) 956-9081	(7 495) 608-8124	InfoMoscow@uswheat.org
PROVIDING SERVICES TO: Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Moldavia, Russia, Tadjikistan, Turkmenistan, Ukraine, Uzbekistan			
ROTTERDAM (Regional Office)	(31 10) 413-9155	(31 10) 433-0438	InfoRotterdam@uswheat.org
PROVIDING SERVICES TO: Albania, Azerbaijan, Armenia, Austria, Belarus, Belgium, Bosnia, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldavia, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tadjikistan, Turkmenistan, Ukraine, United Kingdom, Uzbekistan			
SANTIAGO (Regional Office)	(56 2) 235-7137	(56 2) 235-7371	InfoSantiago@uswheat.org
PROVIDING SERVICES TO: Bolivia, Brazil, Chile, Colombia, Ecuador, Peru			
SEOUL	(822) 720-7926	(822) 720-7925	InfoSeoul@uswheat.org
PROVIDING SERVICES TO: Korea			
SINGAPORE (Regional Office)	(65) 6737-4311	(65) 6733-9359	InfoSingapore@uswheat.org
PROVIDING SERVICES TO: Bangladesh, Burma, Cambodia, India, Indonesia, Malaysia, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam			
TAIPEI	(886 2) 2521-1144	(886 2) 2521-1568	InfoTaipei@uswheat.org
PROVIDING SERVICES TO: Taiwan			
TOKYO	(813) 3582-7911	(813) 3582-7915	InfoTokyo@uswheat.org
PROVIDING SERVICES TO: Japan			