



California Wheat Commission

# Hard Red Wheat 2010 Hard White Wheat 2010



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## CROP QUALITY REPORT 2010

# California Wheat

California's wheat growing regions are defined by climate, value of alternative crops, and the distinct differences in variety selection. This system has led to an implied "identity preserved" program in California.

Over the past few years, Hard White (HW) wheat has become more prevalent in the varietal mix. Therefore, HW quality data is included in this hard wheat report. This trend of increased HW production is expected to continue in the upcoming years.

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

In normal growing conditions, California hard wheat varieties have low moisture and large and uniform kernel size. Because it is predominantly grown under irrigation, growers benefit from high yields and consistent quality. California wheat usually contains significantly less impurities than its counterparts elsewhere.

2010 Crop Conditions. Hard red wheat acreage was up over 15% in the state this year. Hard white wheat acreage was also up slightly compared to the previous season. Joaquin, Redwing, and Cal Rojo topped the list of hard red wheat varieties while Blanca Royale and Blanca Fuerte were the most prevalent hard white varieties. California experienced another cool growing season this year. This resulted in very high yields and variable proteins. Disease pressure was low.

Data in this report. Samples for this year's report were collected from grain handlers and producers. This program collects data throughout the harvest season, resulting in a crop quality report that is highly representative of the crop. Grade information is provided by the Federal Grain Inspection Service. Milling and end-use quality analysis was conducted by the California Wheat Commission Laboratory.

## CALIFORNIA WHEAT PRODUCTION



## PRODUCTION HISTORY

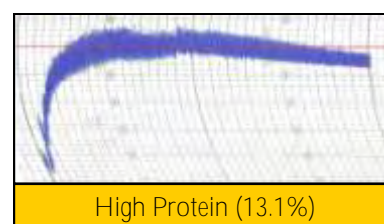
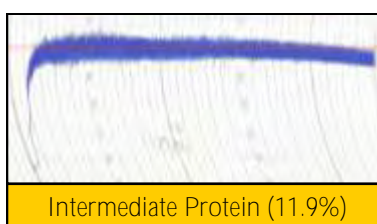
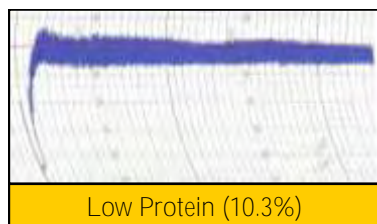
(Winter wheat — all classes, excluding Durum)

YEAR	METRIC TONS (1,000 MT'S)
2010	784
2009	718
2008	925
2007	584
2006	395
2005	587
2004	740
2003	681

# Hard Red Winter (Mixed Varieties)

	Low Protein (10.9% & Below)		Intermediate Protein (11.0% - 12.4%)		High Protein (12.5% & Above)	
	2010	2009	2010	2009	2010	2009
<b>WHEAT</b>						
Protein <sup>1</sup>						
Dry Basis	11.4	11.7	13.3	13.5	15.4	14.9
As - Is	10.4	10.6	12.1	12.3	14.1	13.6
12% MB	10.0	10.3	11.7	11.9	13.5	13.1
Moisture	9.0	9.8	8.6	8.6	8.4	8.8
Test Weight						
lb/bu	63.4	62.7	63.7	62.8	63.5	62.2
kg/hl	83.4	82.5	83.7	82.5	83.4	81.8
1000 Kernel Weight (gr)	46.5	39.2	47.5	40.8	46.7	40.1
SKCS Hardness Score	66	72	67	71	65	68
Kernel Size Distribution						
Large (7W)	94	87	95	89	93	85
Medium (10W)	6	13	5	11	7	15
Small (12W)	0	0	0	0	0	0
<b>MILLING</b>						
Test Mill Yield <sup>2</sup> (%)	69.8	70.3	71.8	73.3	72.7	73.2
Wheat Protein (Dry-Basis)	11.4	11.7	13.3	13.5	15.4	14.9
Flour Protein <sup>1</sup> (Dry-Basis)	10.2	10.4	12.8	12.0	14.2	13.4
Wheat Ash (Dry-Basis)	1.60	1.69	1.61	1.67	1.69	1.75
Flour Ash (Dry-Basis)	0.50	0.54	0.47	0.51	0.48	0.51
<b>FLOUR</b>						
Flour Protein <sup>1</sup> (14% MB)	8.8	9.0	11.0	10.3	12.2	11.5
Flour Ash (14% MB)	0.43	0.46	0.41	0.43	0.41	0.44
Wet Gluten (14% MB)	24.1	23.0	29.2	27.8	34.2	31.5
Falling Number (sec.)	393	430	409	444	418	445
<b>FARINOGRAM</b>						
Arrival Time (min.)	1.4	1.3	2.2	1.7	3.9	2.4
Mixing Peak (min.)	3.0	3.5	6.8	5.9	9.4	6.4
Mixing Tolerance (min.)	10.7	10.3	14.3	15.6	15.4	15.9
Absorption (%)	61.6	60.5	63.7	61.2	64.8	61.3
<b>BAKING RESULTS</b>						
Bake Volume <sup>3</sup> (cc)	784	790	874	859	959	922

Wheat samples were collected by handlers. 1) Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec; 2) Test mill yield: Brabender Quadromat Senior Mill, modified in 1997; 3) Bake Volume = AACC Method 10-10B; 4) Test weight conversion from lb/bu to kg/hl according to FGIS-PN-97-5,  $\{(1.292 \times (\text{lb/bu}) + 1.419)\}$ .



# 2010 Hard Red Variety Specific Information

WHEAT	CAL ROJO			EXPRESSO		
	High <sup>6</sup> Protein	Int. <sup>5</sup> Protein	Low <sup>7</sup> Protein	High Protein	Int. Protein*	Low Protein
Protein <sup>1</sup>						
Dry Basis	14.5	13.2	11.1	14.2	13.5	12.0
As - Is	13.4	12.1	10.1	12.9	12.4	10.8
12% MB	12.8	11.6	9.8	12.5	11.9	10.6
Moisture	7.9	8.6	9.1	9.3	8.6	9.9
Test Weight						
lb/bu	64.0	63.9	63.4	65.2	65.7	63.5
kg/hl	84.1	84.0	83.3	85.6	86.3	83.5
1000 Kernel Weight (gr)	48.8	47.9	46.6	47.3	48.5	41.6
SKCS Hardness Score	64	63	60	71	70	79
Kernel Size Distribution						
Large (7W)	95	95	93	95	97	90
Medium (10W)	5	5	7	5	3	10
Small (12W)	0	0	1	0	0	0
MILLING						
Test Mill Yield <sup>2</sup> (%)	74.6	72.2	70.6	68.7	68.5	65.1
Wheat Protein (Dry-Basis)	14.5	13.2	11.1	14.2	13.5	12.0
Flour Protein <sup>1</sup> (Dry-Basis)	13.3	12.0	10.1	12.9	12.6	10.9
Wheat Ash (Dry-Basis)	1.69	1.56	1.60	1.77	1.79	1.78
Flour Ash (Dry-Basis)	0.48	0.48	0.52	0.47	0.49	0.47
FLOUR						
Flour Protein <sup>1</sup> (14% MB)	11.5	10.3	8.6	11.1	10.8	9.4
Flour Ash (14% MB)	0.42	0.41	0.44	0.40	0.42	0.41
Wet Gluten (14% MB)	32.2	28.5	23.2	32.2	31.3	26.9
Falling Number (sec.)	431	397	389	358	357	375
FARINOGRAM						
Arrival Time (min.)	2.8	1.9	1.2	2.8	2.3	2.0
Mixing Peak (min.)	6.7	5.5	2.8	7.2	4.5	4.3
Mixing Tolerance (min.)	15.8	13.7	10.8	13.3	12.8	9.3
Absorption (%)	62.8	61.7	59.0	67.9	68	66.4
BAKING RESULTS						
Bake Volume <sup>3</sup> (cc)	922	863	774	912	910	810

For protein ranges not indicated, please contact the California Wheat Commission.

\* Limited samples were available for analysis

1) Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec.

2) Test mill yield: Brabender Quadromat Senior Mill, modified in 1997.

3) Bake Volume = AACC Method 10-10B.

4) Test weight conversion from lb/bu to kg/hl according to FGIS-PN-97-5,  $(1.292 \times \text{lb/bu}) + 1.419$ .

5) Intermediate Protein: (11.0-12.4%).

6) High Protein: (12.5% & Above).

7) Low Protein (10.9% & Below).

# 2010 Hard Red Variety Specific Information

REDWING			JOAQUIN		TRIPLE IV	WHEAT
High Protein	Int. Protein	Low Protein	High Protein	Int. Protein	High Protein	
14.5	13.2	11.7	15.8	13.3	16.1	Protein <sup>1</sup> Dry Basis
13.3	12.1	10.7	14.5	12.1	14.7	As - Is
12.8	11.6	10.3	13.9	11.7	14.2	12% MB
8.0	8.6	8.6	8.4	8.7	8.8	Moisture
62.5	63.3	63.4	63.4	63.8	62.3	Test Weight lb/bu
82.2	83.2	83.3	83.3	83.8	81.8	kg/hl
45.4	46.9	47.1	46.1	47.6	46.7	1000 Kernel Weight (gr)
66	71	72	65	67	64	SKCS Hardness Score
92	96	96	93	94	91	Kernel Size Distribution Large (7W)
8	4	4	7	6	9	Medium (10W)
0	0	0	0	0	0	Small (12W)
72.8	71.2	69.3	73.0	72.7	70.5	MILLING Test Mill Yield <sup>2</sup> (%)
14.5	13.2	11.7	15.8	13.3	16.1	Wheat Protein (Dry-Basis)
13.2	14.0	10.4	14.7	12.1	14.8	Flour Protein <sup>1</sup> (Dry-Basis)
1.66	1.60	1.58	1.70	1.70	1.80	Wheat Ash (Dry-Basis)
0.49	0.48	0.48	0.48	0.45	0.44	Flour Ash (Dry-Basis)
11.6	12.0	8.9	12.7	10.4	12.7	FLOUR Flour Protein <sup>1</sup> (14% MB)
0.42	0.41	0.42	0.41	0.39	0.38	Flour Ash (14% MB)
30.9	28.5	24.9	35.3	30.4	35.7	Wet Gluten (14% MB)
444	411	402	426	433	375	Falling Number (sec.)
2.6	2.0	1.5	4.7	2.7	3.3	FARINOGRAM Arrival Time (min.)
7.6	5.6	3.2	11.1	10.4	7.5	Mixing Peak (min.)
13.0	13.8	10.6	15.9	16.2	16.3	Mixing Tolerance (min.)
64.0	64.7	64.6	65.5	64.7	62.9	Absorption (%)
911	864	796	982	897	979	BAKING RESULTS Bake Volume <sup>3</sup> (cc)-



# Hard Red Wheat Grade Data

	HARVEST DATA			EXPORT CARGO AVERAGE	
	2010	2009	2008	10/09	08/09
Test Weight					
lb/bu	63.0	63.0	62.5	**	**
kg/hl <sup>2</sup>	81.7	81.4	82.0	**	**
Moisture (%)	9.2	9.1	8.7	**	**
Damage (%)	0.1	0.1	0.0	**	**
*Foreign Material (%)	0.3	0.1	0.1	**	**
*Shrunken/Broken (%)	0.5	0.6	0.5	**	**
Total Defects (%)	0.9	0.8	0.6	**	**
*Dockage (%)	1.0	0.8	0.7	**	**
Total Screenings (%)	1.8	1.5	1.3	**	**
Moisture (%)	9.2	9.1	8.7	**	**
Net Weight (%) <sup>3</sup>	89.2	89.5	89.4	**	**
CTW (%) <sup>4</sup>	106.1	106.5	106.4	**	**
MWVI (%) <sup>5</sup>	94.2	93.9	94.0	**	**

\*\* Data not available. Cargo data represents information obtained from official export inspection certificates. Export year = June 1-July 30. Harvest year = Calendar year. \*Total Screenings are those factors represented on the grade certificate that are cleaned out in the flour mill. <sup>2</sup>Test weight conversion from lb/bu to kg/hl according to FGIS-PN-97-5, (1.292 x lb/bu) + 1.419. <sup>3</sup>Net Weight = (100% - (FM + SHBN + Dockage)) x (100% - Moisture) / 100%. <sup>4</sup>Clean, Tempered Wheat (CTW%) = (100% - (FM + SHBN + Dockage)) x (100% - Moisture) / (100% - 16% (temper moisture)). <sup>5</sup>Millable Wheat Value Index (MWVI) = 100% / CTW.

## Varietal Descriptions

Cal Rojo (HRW) is a widely adapted, high yielding variety for both the San Joaquin and Sacramento Valleys. It is mid-early maturing and receives high scores for grain quality, milling and baking. It continues to show resistance to stripe rust in University trials and general production although a few isolated infections call for diligent monitoring.

Expresso (HRW) is very similar to the former variety Express but has two added stripe rust resistance genes. The quality of Expresso is identical to Express, having high flour water absorption and good baking quality.

Joaquin (HRW) is adapted to the San Joaquin Valley and has high percent protein and test weight with very good mixing and baking properties.

Redwing (HRW) is a newer high-quality wheat for both the Sacramento and San Joaquin Valleys that has been one of the top yielding hard red variety in University trials. It shows high resistance to stripe rust and receives high scores for grain quality, milling and baking.

Triple IV (HRW) is a very early awnless forage variety that has acceptable milling and baking properties. Often grown on dryland.

Blanca Grande (HW) has become a benchmark for high end-use quality. It remains a top yielding variety in both the San Joaquin and Sacramento Valleys when not affected by stripe rust, to which it is susceptible. Blanca Grande 515, a variant of Blanca Grande with two effective genes for stripe rust resistance added by marker assisted selection, will be available for full-scale commercial grain production in 2010-2011.

Blanca Fuerte (HW) is a widely adapted, extremely high yielding variety for both the San Joaquin and Sacramento Valleys. It is classified as “highly resistant” to stripe rust, and its grain is notable for its high test weight, high falling number, and low PPO. When fertilized adequately to produce desired levels of protein, it receives high scores for end use quality.

# 2010 Hard White Wheat

WHEAT	BLANCA FUERTE		BLANCA GRANDE		BLANCA ROYALE			WB-CRISTALLO			PATWIN	
	Int. Pro.*	Low Pro.	High Pro.	Int. Pro.	High Pro.	Int. Pro.	Low Pro.	High Pro.	Int. Pro.*	Low Pro.	Int. Pro.*	Low Pro.
Protein												
Dry Basis	12.7	11.2	15.2	13.5	14.5	13.2	11.7	14.7	12.8	11.8	12.8	10.9
As - Is	11.6	10.1	13.9	12.3	13.3	12.2	10.8	13.4	11.7	10.7	11.7	9.9
12% MB	11.2	9.81	13.4	11.9	12.7	11.6	10.3	12.9	11.3	10.4	11.3	9.6
Moisture	8.9	9.6	8.2	8.8	8.1	7.8	8.2	8.8	8.8	9.2	9.0	9.1
Test Weight												
1b/bu	65.8	65.1	64.3	65.0	63.9	64.5	64.8	63.5	64.7	65.5	63.8	64.2
kg/hl <sup>4</sup>	86.4	85.6	84.5	85.4	84.0	84.7	85.1	83.4	85.0	86.1	83.9	84.3
1000 Kernel Weight (gr)	51.4	50.9	45.3	46.2	42.3	44.6	44.3	41.5	43.9	48.7	45.1	45.4
SKCS Hardness Score	64	65	63	68	67	67	67	69	71	70	74.3	76.3
Kernel Size Distribution												
Large (7W)	98	95	94	95	89	93	93	88	94	95	95	93
Medium (10W)	2	4	6	5	11	7	7	12	6	5	5	6
Small (12W)	0	0	0	0	0	0	0	0	0	0	0	0
MILLING												
Test Mill Yield <sup>2</sup> (%)	72.1	72.0	73.3	72.9	72.3	73.2	71.5	69.2	68.4	70.1	69.2	67.8
Wheat Protein (Dry Basis)	12.7	11.2	15.2	13.5	14.5	13.2	11.7	14.7	12.8	11.8	12.8	10.9
Flour Protein <sup>1</sup> (Dry Basis)	11.0	9.9	14.0	12.2	13.2	12.0	10.5	13.5	11.4	10.5	11.4	9.8
Wheat Ash (Dry Basis)	1.54	1.58	1.72	1.55	1.73	1.62	1.62	1.87	1.63	1.63	1.65	1.69
Flour Ash (Dry Basis)	0.39	0.47	0.45	0.43	0.47	0.47	0.47	0.50	0.46	0.47	0.52	0.54
FLOUR												
Flour Protein <sup>1</sup> (14% MB)	9.5	8.5	12.0	10.5	11.4	10.3	9.0	11.6	9.8	9.1	9.8	8.5
Flour Ash (14% MB)	0.34	0.40	0.39	0.37	0.41	0.40	0.41	0.43	0.40	0.41	0.44	0.46
Wet Gluten (14% MB)	23.8	22.9	32.7	29.1	29.7	28.1	23.1	30.3	27.3	24.7	27.7	22.0
Falling Number (sec)	459	408	359	364	418	429	406	431	375	405	378	352
FARINOGRAM												
Arrival Time (min.)	1.5	1.3	4.0	2.3	2.3	1.7	1.3	3.7	3.5	1.3	1.8	1.3
Mixing Peak (min.)	2.0	2.4	9.0	7.3	5.5	5.0	3.3	11.8	9.7	6.0	9.3	3.0
Mixing Tolerance (min.)	7.0	8.1	12.6	12.1	9.6	10.8	8.5	14.9	16.5	12.5	17.4	8.8
Absorption (%)	62.6	61.5	66.7	62.8	60.2	59.8	58.3	65.6	64.7	63.2	65.6	66.3
BAKING RESULTS												
Bake Volume <sup>3</sup> (cc)	800	767	977	892	888	844	785	1000	888	832	866	773

\* Limited samples were available for analysis. 1) Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec. 2) Test mill yield: Brabender Quadromat Senior Mill, modified in 1997. 3) Bake Volume = AACC Method 10-10B. 4) Test weight conversion from lb/bu to kg/hl according to FGIS-PN-97-5: (1.292 x lb/bu) + 1.419.

## Varietal Descriptions *continued...*

Blanca Royale (HW) is grown primarily in the San Joaquin Valley. It is classified as “highly resistant” to stripe rust, and achieves higher protein but lower yields than Blanca Fuerte grown under the same conditions. It receives high scores for grain quality, milling and baking, and has been identified as being an outstanding wheat for noodle production due to its excellent noodle color and special starch characteristics.

Patwin (HW) is a high yielding white variety characterized by very high levels of protein. This variety is adapted to both the Sacramento and San Joaquin valleys and is resistant to current races of stripe rust. Patwin also carries resistance to root knot nematodes. Patwin has received excellent scores for milling and baking parameters.

WB-Cristallo (HW) is adapted to the Sacramento Valley and has above average percent protein with good milling and baking properties with good falling numbers for a white wheat.



# Technical and Laboratory Services

The California Wheat Commission laboratory has the equipment necessary for evaluation of wheat and durum milling quality, chemical analysis of wheat and flour, physical dough testing, semolina analysis, bake and noodle production tests, and pasta analysis.

The Commission's staff is available to work for customers in the area of quality assurance, problem solving, quality control training, and research. The price list for laboratory services is available on the California Wheat Commission website at [www.californiawheat.org](http://www.californiawheat.org).



## **Customer Assistance and Support**

- The Commission is available to answer *technical questions* about California's wheat quality, including recommendations for blending and appropriate end-use.
- The Commission conducts *specialized training programs* in milling, baking, semolina, pasta, and quality control. These specific programs may be customized to meet the customer's needs.

## **Crop and Export Survey**

California produces five classes of wheat: Hard Red Winter (HRW), Desert Durum®, Hard White, Soft White Wheat, and Hard Red Spring. While HRW and Durum are the predominately produced and exported classes, all wheat classes are surveyed and information is available at the Commission office. Every effort is extended to make sure that an accurate assessment of quality is made available to buyers. With greater amounts of wheat being sold by variety, varietal specific information is emphasized in Commission surveys.

## **Research**

The Commission laboratory is available for flour, semolina, milling, end-product, and new-product research. Technical expertise is available in hearth breads, pasta, Asian food products, standard loaf bread, steamed bread, Asian noodles, cookies, tortillas and middle-eastern flat breads.

## **Varietal Development**

Private and public breeding programs play an important role in the development of new varieties available to California wheat producers. The Commission analyzes over 1,000 samples each year to support these programs and encourages the release of new varieties that will meet the customers' needs.

Advanced varieties are evaluated by commercial mills through the California Wheat Collaborator program.

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