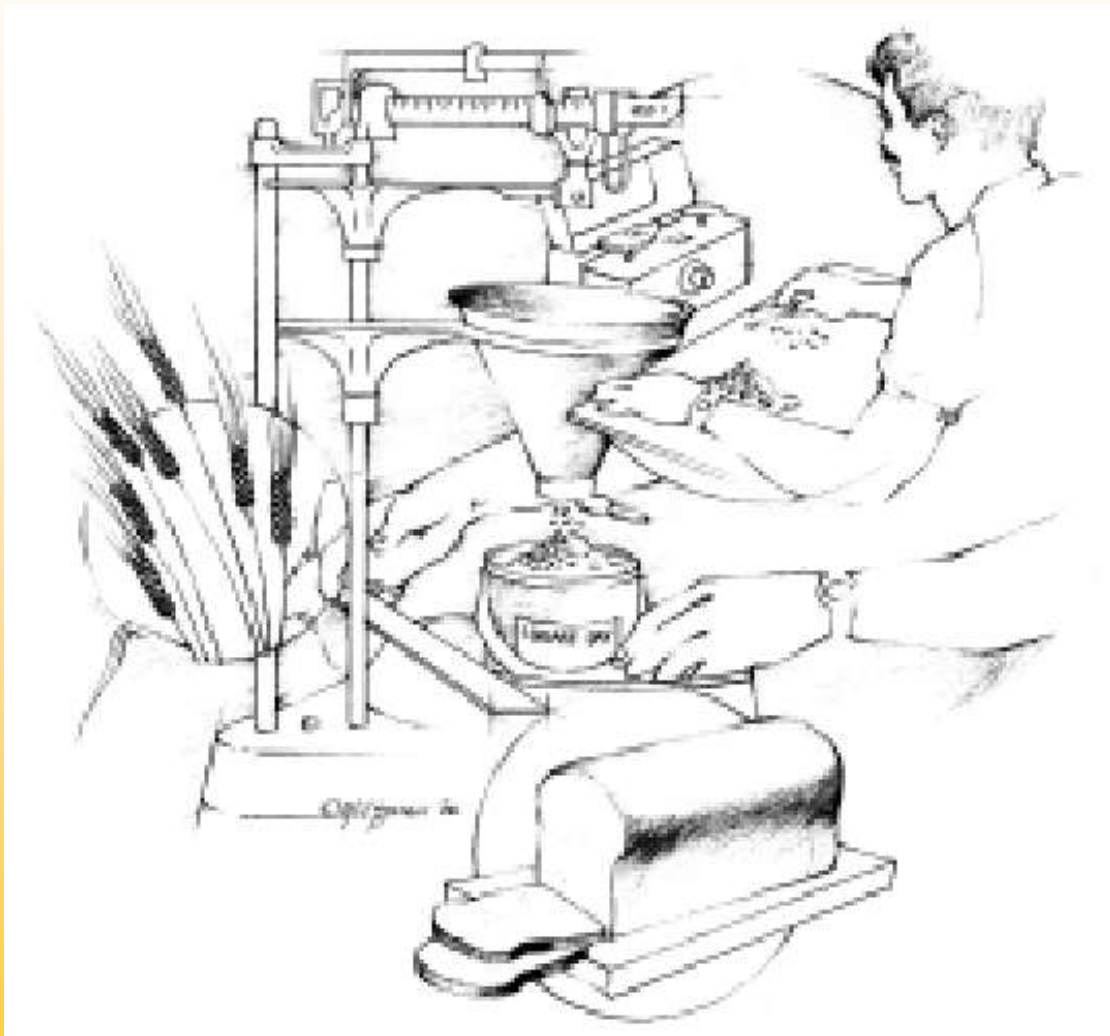




California Wheat Commission

Hard Red Wheat 2011
Hard White Wheat 2011



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CROP QUALITY REPORT 2011

California Wheat

California's wheat growing regions are defined by climate, value of alternative crops, and the distinct differences in variety selection.

California produces both Hard Red and Hard White wheat. Red and white wheat in California accounted for over 85% of all wheat acreage planted for harvest in 2011, with red wheat alone accounting for 70% of varieties planted. This report includes quality data for both Hard Red and Hard White varieties.

Most California hard wheat is planted from October to January and 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.

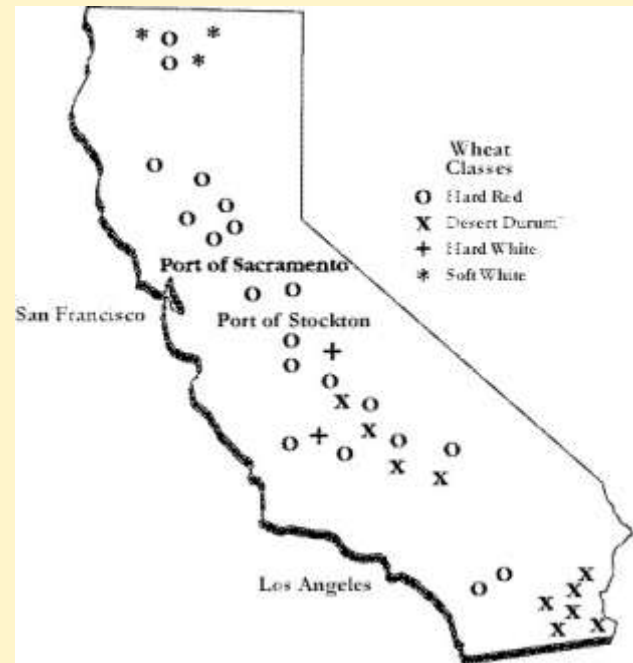
2011 Crop Conditions

California experienced another cool, wet growing season. Hard Red wheat acreage in the state increased again this year in response to strong prices. Hard White wheat was unchanged in one region of the state, but down in another. Yields were high and proteins variable, but overall quality was superior to last year. Disease pressure was present in susceptible varieties.

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

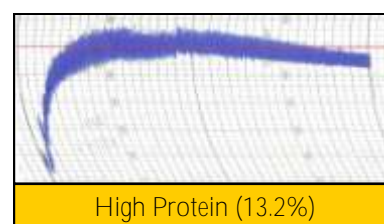
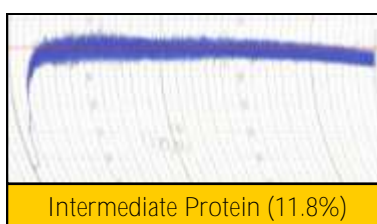
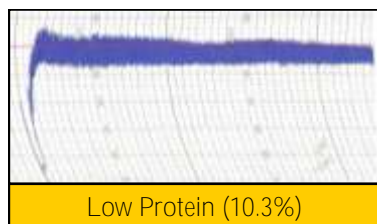
(Winter wheat — all classes, excluding Durum)

YEAR	METRIC TONS (1,000 MT'S)
2011	972
2010	784
2009	718
2008	925
2007	584
2006	395
2005	587
2004	740

Hard Red Winter (Mixed Varieties)

	Low Protein (10.9% & Below)		Intermediate Protein (11.0% - 12.4%)		High Protein (12.5% & Above)	
	2011	2010	2011	2010	2011	2010
WHEAT						
Protein ¹						
Dry Basis	11.7	11.4	13.4	13.3	15.0	15.4
As - Is	10.6	10.4	12.3	12.1	13.7	14.1
12% MB	10.3	10.0	11.8	11.7	13.2	13.5
Moisture	8.8	9.0	8.9	8.6	8.9	8.4
Test Weight						
lb/bu	62.8	63.4	62.3	63.7	62.3	63.5
kg/hl ⁴	82.5	83.4	81.9	83.7	81.9	83.4
1000 Kernel Weight (gr)	44.8	46.5	44.1	47.5	44.7	46.7
SKCS Hardness Score	58	66	60	67	59	65
Kernel Size Distribution						
Large (7W)	94	94	92	95	90	93
Medium (10W)	6	6	8	5	10	7
Small (12W)	0	0	0	0	0	0
MILLING						
Test Mill Yield ² (%)	72.7	69.8	73.9	71.8	73.7	72.7
Wheat Protein (Dry-Basis)	11.7	11.4	13.4	13.3	15.0	15.4
Flour Protein ¹ (Dry-Basis)	10.6	10.2	12.3	12.8	13.8	14.2
Wheat Ash (Dry-Basis)	1.65	1.60	1.67	1.61	1.74	1.69
Flour Ash (Dry-Basis)	0.54	0.50	0.52	0.47	0.54	0.48
FLOUR						
Flour Protein ¹ (14% MB)	9.1	8.8	10.5	11.0	11.9	12.2
Flour Ash (14% MB)	0.47	0.43	0.45	0.41	0.46	0.41
Wet Gluten (14% MB)	22.8	24.1	27.3	29.2	30.9	34.2
Falling Number (sec.)	387	393	402	409	397	418
FARINOGRAM						
Arrival Time (min.)	1.6	1.4	2.1	2.2	2.9	3.9
Mixing Peak (min.)	4.0	3.0	6.3	6.8	7.5	9.4
Mixing Tolerance (min.)	10.8	10.7	14.3	14.3	15.4	15.4
Absorption (%)	62.2	61.6	63.5	63.7	64.2	64.8
BAKING RESULTS						
Bake Volume ³ (cc)	823	784	891	874	926	959

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, $\{(1.292 \times (\text{lb/bu}) + 1.419)\}$.



2011 Hard Red Variety Specific Information

	CAL ROJO			JOAQUIN	
	High ⁵ Protein	Int. ⁶ Protein	Low ⁷ Protein	High Protein	Int. Protein*
WHEAT					
Protein ¹					
Dry Basis	15.0	13.3	11.5	14.9	13.8
As - Is	13.6	12.1	10.5	13.6	12.5
12% MB	13.2	11.7	10.1	13.1	12.1
Moisture	9.2	8.8	9.2	8.7	9.0
Test Weight					
lb/bu	62.0	62.0	62.3	63.1	63.1
kg/hl	81.5	81.5	82.0	83.0	83.0
1000 Kernel Weight (gr)	46.4	43.7	46.2	46.6	47.0
SKCS Hardness Score	55	56	49	58	58
Kernel Size Distribution					
Large (7W)	90	91	93	94	93
Medium (10W)	10	9	7	6	7
Small (12W)	0	0	0	0	0
MILLING					
Test Mill Yield ² (%)	73.1	73.1	74.0	76.7	76.5
Wheat Protein (Dry-Basis)	15.0	13.3	11.5	14.9	13.8
Flour Protein ¹ (Dry-Basis)	13.9	11.9	10.4	13.7	12.7
Wheat Ash (Dry-Basis)	1.75	1.68	1.63	1.63	1.62
Flour Ash (Dry-Basis)	0.57	0.54	0.55	0.48	0.46
FLOUR					
Flour Protein ¹ (14% MB)	11.9	10.3	9.0	11.8	10.9
Flour Ash (14% MB)	0.49	0.47	0.48	0.41	0.40
Wet Gluten (14% MB)	30.0	26.2	22.2	32.0	29.8
Falling Number (sec.)	388	413	382	405	401
FARINOGRAM					
Arrival Time (min.)	2.8	2.0	1.5	3.1	2.4
Mixing Peak (min.)	7.6	5.7	3.7	8.0	7.3
Mixing Tolerance (min.)	16.9	13.7	9.0	14.9	14.3
Absorption (%)	63.1	62.1	59.6	64.3	63.6
BAKING RESULTS					
Bake Volume ³ (cc)	914	855	801	953	921

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) High Protein: (12.5% & Above).

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

7) Low Protein (10.9% & Below).

2011 Hard Red Variety Specific Information

REDWING			TRIPLE IV		WB-ROCKLAND		
High Protein	Int. Protein	Low Protein	High Protein	Int. Protein	High Protein	Int. Protein	
15.1	13.4	11.7	15.6	13.3	15.4	13.2	WHEAT Protein ¹ Dry Basis
13.8	12.3	10.7	14.3	11.9	13.9	12.0	As - Is
13.3	11.8	10.3	13.7	11.7	13.5	11.6	12% MB
8.6	8.7	8.7	8.6	10.4	9.4	9.3	Moisture
							Test Weight lb/bu
61.2	62.0	62.6	62.2	60.9	64.8	65.2	
80.5	81.5	82.3	81.8	80.1	85.2	85.7	kg/hl
42.0	42.9	44.1	42.0	44.0	41.5	45.0	1000 Kernel Weight (gr)
61	62	62	68	66	70	70	SKCS Hardness Score
							Kernel Size Distribution
87	92	94	90	88	92	95	Large (7W)
13	8	6	10	11	8	5	Medium (10W)
0	0	0	0	1	0	0	Small (12W)
							MILLING
72.4	71.4	72.4	70.6	70.5	74.1	69.9	Test Mill Yield ² (%)
15.1	13.4	11.7	15.6	13.3	15.4	13.2	Wheat Protein (Dry-Basis)
13.7	12.3	10.7	14.3	12.3	14.2	11.9	Flour Protein ¹ (Dry-Basis)
1.81	1.66	1.65	1.83	1.89	1.77	1.71	Wheat Ash (Dry-Basis)
0.55	0.52	0.55	0.56	0.64	0.53	0.54	Flour Ash (Dry-Basis)
							FLOUR
11.8	10.6	9.2	12.3	10.6	12.2	10.2	Flour Protein ¹ (14% MB)
0.47	0.45	0.48	0.48	0.55	0.46	0.47	Flour Ash (14% MB)
30.4	26.9	22.6	30.5	24.6	34.0	28.6	Wet Gluten (14% MB)
408	399	397	423	423	364	355	Falling Number (sec.)
							FARINOGRAM
2.6	2.1	1.7	2.6	1.7	3.3	2.3	Arrival Time (min.)
7.3	5.9	4.1	5.6	5.7	9.1	8.9	Mixing Peak (min.)
15.6	14.3	11.8	11.2	12.5	15.7	19.3	Mixing Tolerance (min.)
64.1	64.0	63.2	65.6	63.9	67.3	65.1	Absorption (%)
							BAKING RESULTS
915	900	833	903	825	984	896	Bake Volume ³ (cc)



Hard Red Wheat Grade Data

HARVEST DATA

	<u>2011</u>	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>
Test Weight: lb/bu	62.6	63.3	63.0	63.5	62.3
kg/hl ²	82.3	83.2	82.8	83.5	81.9
Moisture (%)	9.3	9.2	9.1	8.7	9.4
Damage (%)	0.1	0.1	0.1	0.0	0.0
*Foreign Material (%)	0.1	0.3	0.1	0.1	0.2
*Shrunken/Broken (%)	0.5	0.5	0.6	0.5	0.6
Total Defects (%)	0.7	0.9	0.8	0.6	0.8
*Dockage (%)	0.8	1.0	0.8	0.7	0.7
Total Screenings (%)	1.4	1.8	1.5	1.3	1.5
Moisture (%)	9.3	9.2	9.1	8.7	9.4
Net Wheat (%) ³	89.4	89.2	89.5	89.4	89.2
CTW (%) ⁴	106.4	106.1	106.5	106.4	106.2
MWVI (%) ⁵	93.9	94.2	93.9	94.0	94.2

Harvest year = Calendar year. *Total Screenings are those factors represented on the grade certificate that are cleaned out in the flour mill. ²Test weight conversion from lb/bu to kg/hl according to FGIS-PN-97-5, $(1.292 \times \text{lb/bu}) + 1.419$. ³Net Wheat = $(100\% - (\text{FM} + \text{SHBN} + \text{Dockage})) \times (100\% - \text{Moisture}) / 100\%$. ⁴Clean, Tempered Wheat (CTW%) = $(100\% - (\text{FM} + \text{SHBN} + \text{Dockage})) \times (100\% - \text{Moisture}) / (100\% - 16\%(\text{temper moisture}))$. ⁵Millable Wheat Value Index (MWVI) = $100\% / \text{CTW}$.

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.

Joaquin (HRW) is adapted to the San Joaquin Valley and has high protein and test weight with very good milling 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 varieties 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.

WB-Rockland (HRW) is a very high protein variety adapted to the Sacramento Valley. It has high falling numbers and very good milling and baking qualities. It is resistant to stripe rust and moderately resistant to Septoria.

Blanca Grande 515 (HW) is a variant of the variety Blanca Grande with two effective genes for stripe rust resistance added by marker assisted selection. Thus, it is resistant to stripe rust while all other traits of Blanca Grande, including its excellent end-use quality and high yielding ability in both the San Joaquin and Sacramento Valleys, remain in this variety.

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.

WB-Paloma (HW) is adapted to the San Joaquin Valley. It has received excellent milling and baking scores. It has low PPO and contains one waxy gene which makes it an excellent variety for Asian noodle production. It has high flour viscosity.

2011 Hard White Wheat

	BLANCA GRANDE 515		BLANCA ROYALE		PATWIN			WB-CRISTALLO			WB-PALOMA
	High Pro.	Int. Pro.	High Pro.*	Int. Pro.	High Pro.*	Int. Pro.*	Low Pro.	High Pro.*	Int. Pro.	Low Pro.	High Pro.
WHEAT Protein Dry Basis	15.3	13.5	14.5	13.5	14.3	12.8	11.6	14.5	13.3	11.8	14.5
As - Is	13.9	12.3	13.2	12.3	13.0	11.5	10.4	12.9	11.9	10.7	13.0
12% MB	13.5	11.9	12.7	11.8	12.6	11.3	10.2	12.7	11.7	10.4	12.7
Moisture	9.2	8.9	9.0	8.9	9.7	10.1	10.2	10.8	10.6	9.7	9.9
Test Weight 1b/bu	64.2	63.9	64.0	64.0	62.5	61.6	63.3	63.7	62.2	63.3	65.4
kg/hl ⁴	84.4	84.0	84.1	84.1	82.2	80.9	83.2	83.7	81.7	83.2	85.9
1000 Kernel Weight (gr)	47.6	44.4	45.5	42.8	43.8	42.8	38.5	40.8	40.9	40.3	52.1
SKCS Hardness Score	50	58	50	59	69	74	83	70	57	63	60
Kernel Size Distribution Large (7W)	96	91	94	91	93	86	83	90	89	90	98
Medium (10W)	4	9	6	9	7	14	17	10	11	10	2
Small (12W)	0	0	0	0	0	0	0	0	0	0	0
MILLING Test Mill Yield ² (%)	75.2	74.2	73.0	73.6	71.2	69.2	66.4	67.7	72.2	63.9	73.3
Wheat Protein (Dry Basis)	15.3	13.5	14.5	13.5	14.3	12.8	11.6	14.5	13.3	11.8	14.5
Flour Protein ¹ (Dry Basis)	13.8	12.3	13.1	12.2	13.1	11.9	10.2	13.1	12.1	10.7	12.7
Wheat Ash (Dry Basis)	1.80	1.70	1.75	1.68	1.72	1.70	1.65	1.50	1.60	1.65	1.66
Flour Ash (Dry Basis)	0.47	0.53	0.48	0.53	0.58	0.55	0.52	0.45	0.51	0.52	0.54
FLOUR Flour Protein ¹ (14% MB)	11.9	10.5	11.3	10.5	11.3	10.3	8.8	11.3	10.4	9.2	10.9
Flour Ash (14% MB)	0.40	0.46	0.41	0.45	0.49	0.47	0.45	0.39	0.44	0.45	0.46
Wet Gluten (14% MB)	32.2	28.2	28.0	27.2	28.8	25.1	21.7	28.8	26.6	22.6	27.8
Falling Number (sec)	342	350	371	382	376	359	362	363	370	375	324
FARINOGRAM Arrival Time (min.)	3.4	2.3	2.6	2.1	2.9	2.0	1.6	2.9	2.4	1.7	1.7
Mixing Peak (min.)	7.3	6.2	5.5	6.6	5.8	5.4	3.6	9.5	7.9	6.0	6.8
Mixing Tolerance (min.)	14.2	11.7	14.0	13.8	8.8	9.5	8.4	7.3	12.7	12.8	14.9
Absorption (%)	63.2	63.7	64.1	62.6	67.4	65.9	64.0	63.6	64.0	64.2	64.5
BAKING RESULTS Bake Volume ³ (cc)	955	911	950	885	923	850	810	932	901	825	869

* 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...*

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 and has high falling numbers even in years with cool springs. 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.

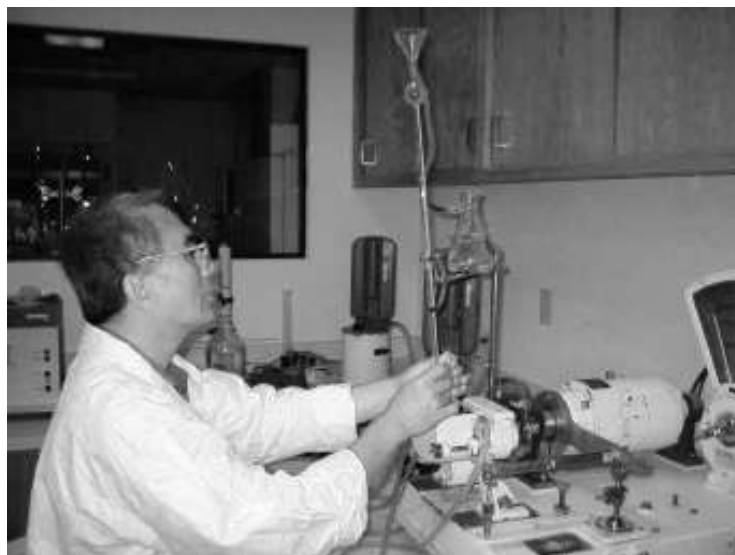
Note: Varietal Descriptions provided by breeders



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 with 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.



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 of the six classes of U.S. wheat: Hard Red Winter (HRW), Desert Durum®, Hard White, Soft White Wheat, and Hard Red Spring. While HRW, Hard White, and Durum are the predominately produced and exported classes, information and contacts for all the above classes of wheat are available by contacting the Commission office. Every effort is made to provide an accurate assessment of quality 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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