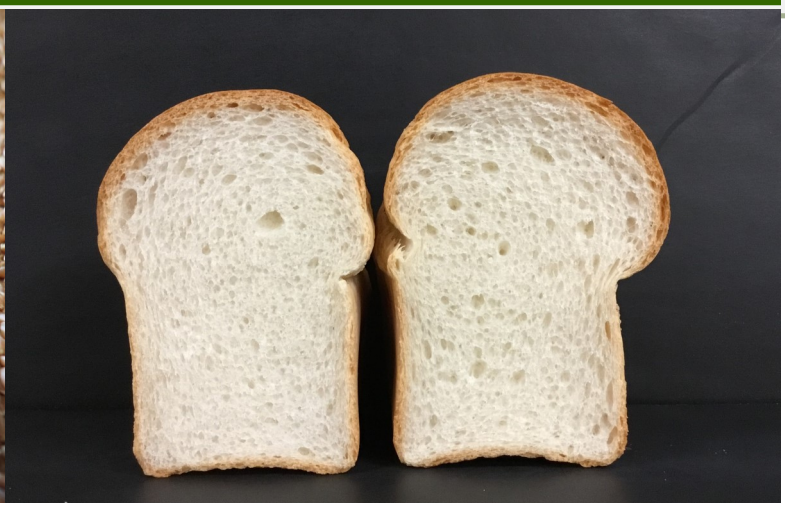


California Crop Quality Report

2021 Hard Red Wheat / Hard White Wheat

California WHEAT COMMISSION

California Wheat

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

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, importers are encouraged to express their interest in purchasing California wheat in early spring. For Hard White wheat, buyers should consider communicating with grain handlers and contracting for acres before planting time.

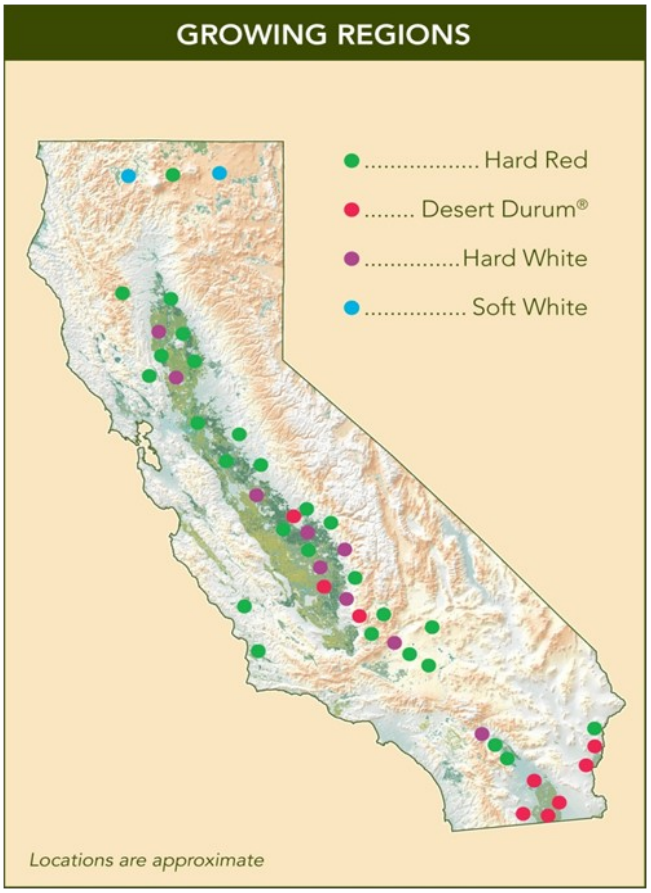
2021 Crop Conditions

For a second consecutive year, 2020-21 rainfall in California was below average. Across the wheat growing regions of the state, rainfall was just over 50% of the 10-year average. Drought in the Sacramento Valley and the northern San Joaquin Valley was even more pronounced with annual rainfall at approximately 40% of normal. In this area, where season-long irrigation is less standard than the practices farther south, there were notable dry periods with little or no rainfall in the early season: first between mid-November and mid-December and again between late-December and late-January. This negatively affected stand establishment ad early vegetative growth for many fields in the region. This was compounded by heavy predation of stands by migratory geese early in the season. Overall, disease incidence was relatively low in the state, with some notable exceptions of stripe rust reported in the Delta region and the northern San Joaquin Valley in mid-to-late April. This included infection observed on a wheat variety previously classified as resistant to stripe rust. Weather during grain filling was dry and average-to-cooler-than-average in much of the state. Overall, grain yields were average or below average for the season.

Data for this Report

Samples for this year's report were collected from grain handlers and producers around the state. This program collects samples throughout the harvest season, resulting in a crop quality report that is highly representative of the crop. Averages are reported for each growing region: Sacramento and San Joaquin Valleys.

Crop Quality values cannot be used to compare varieties since they are harvested from different fields. Weather, soil, and cultural practices can influence the quality of all varieties between years and of particular lots of any one variety.



PRODUCTION HISTORY*

YEAR	METRIC TONS (1,000 MT's)	SHORT TONS (1,000 ST's)
2021	131	144
2020	208	230
2019	239	263
2018	231	255
2017	270	299
2016	361	398
2015	336	370

*All common wheat (excluding Durum).

HARD RED WHEAT GRADE HARVEST DATA					
	2021	2020	2019	2018	2017
Test Weight: lb/bu	63.1	62.9	62.5	62.6	62.8
kg/hl	83.0	82.7	82.2	82.3	82.6
Moisture (%)	9.6	9.2	8.6	9.6	8.7
Damaged (%)	0.0	0.0	0.1	0.1	0.1
Foreign Material* (%)	0.1	0.1	0.1	0.1	0.1
Shrunken/Broken* (%)	0.6	0.5	0.7	0.8	0.8
Total Defects (%)	0.7	0.6	0.8	1.0	1.0
Dockage* (%)	0.9	0.9	1.1	1.1	1.0
Total Screenings (%)	1.6	1.5	1.9	2.0	1.9
Net Wheat (%)	88.9	89.5	89.7	88.6	88.5
CTW (%)	105.9	106.5	106.8	105.5	105.3
MWVI (%)	94.4	93.9	93.6	94.8	94.9

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

Varietal Descriptions

HARD RED WHEAT

Cal Rojo (HRS) is a widely adapted, high yielding variety for both the San Joaquin and Sacramento Valleys. It is mid-early maturing and receives good scores for grain, milling, and baking quality.

Summit 515 (HRS) is a variant of the variety Summit with two effective genes for stripe rust resistance added by marker assisted selection. Summit 515 has very high yield potential in both the San Joaquin and Sacramento Valleys.

WB-9229 (HRS) is adapted to both the San Joaquin and Sacramento Valleys. It has medium to high protein and test weight and has excellent milling and baking properties. It is moderately resistant to Septoria and is resistant to the current races of stripe rust.

WB-Joaquin Oro (HRS) is adapted to the San Joaquin Valley and has high protein and test weight with excellent milling and baking properties, similar to the variety Joaquin. In addition, WB-Joaquin Oro carries two genes for stripe rust resistance, one of which is effective against all current races.

SY-Sienna (HRS) is a Hard Red Spring Wheat developed by Syngenta Seeds, Inc. It has a high yield potential, good protein and test weight. It is a semi-dwarf, plant height similar to Redwing expressing very good straw strength, medium to late maturity, awed, white chaff and strap head type. It has a good general foliar disease package which includes resistance reaction to current stripe rust races. SY Sienna has performed well in Syngenta's trials and in the Variety Testing Program for several years.

AP-Octane (HRS) is AP Octane is a hard red spring wheat bred and developed by Syngenta Participation AG. AP Octane was selected for height, maturity, appearance, kernel color, kernel soundness, disease reaction, and end use quality. AP Octane is primarily adapted to Sacramento and San Joaquin Valleys. Stripe Rust: AP Octane has shown above average tolerance to current races of stripe rust.

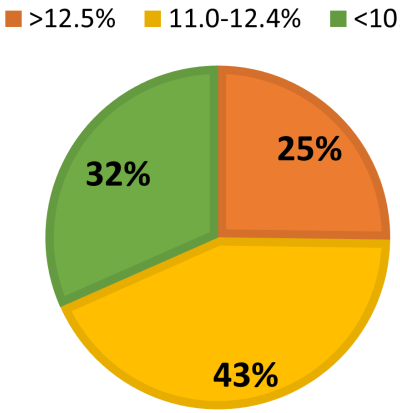
WB-9699 (HRS) is a hard red spring variety adapted to the Southern San Joaquin and Sacramento Valley with excellent grain yield potential and stripe rust resistance. It has excellent standability. It has been found to have adequate milling and baking quality aspects and end use quality according to wheat quality lab testing done previously.

KERNEL QUALITY DATA

State and Region	Protein (12% moisture) %	Ash %	Moisture %	Falling Number SEC	Test Weight lbs/bu	Test Weight Kg/hL	SKCS Hardness Score	1000 Kernel Weight g	Kernel Size Distribution Large %	Kernel Size Distribution Medium %	Kernel Size Distribution Small %	Micro Sed CC
HARD RED WINTER WHEAT												
Sacramento Valley	11.7	1.48	8.8	329	63.6	83.6	70.1	41.4	85	15	0	52
San Joaquin Valley	12.0	1.49	7.5	358	64.5	84.8	66.6	44.5	91	9	0	46
State Avg. 2021	11.8	1.48	8.2	343	64.1	84.2	68.4	43.0	88	12	0	49
HARD WHITE WHEAT												
Sacramento Valley	12.8	1.45	8.6	364	61.5	80.8	81.7	35.7	61	39	0	65
State Avg. 2021	12.8	1.45	8.6	364	61.5	80.8	81.7	35.7	61	39	0	65

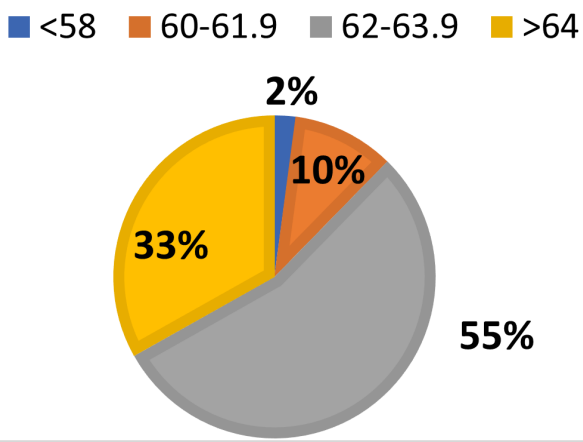
PROTEIN (12% MOISTURE)

STATE DISTRIBUTION



TEST WEIGHT (Lbs/bu)

STATE DISTRIBUTION



FLOUR QUALITY DATA

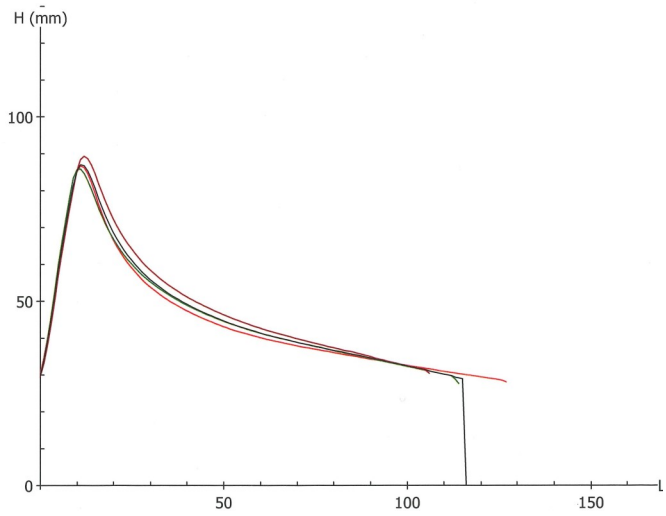
State and Region	Lab Mill Yield %	Protein (14% moisture) %	Ash %	Gluten Index	Wet Gluten %	SRC GPI	Water/ 50% Sucrose	5% Lactic Acid/ 5% NA_2CO_3	Falling Number SEC
HARD RED WINTER WHEAT									
Sacramento Valley	67.5	10.6	0.46	97.7	26.5	0.72	65/105	136/83	366
San Joaquin Valley	67.9	11.2	0.45	96.1	30.1	0.73	65/103	134/80	410
State Avg. 2021	67.7	10.9	0.45	96.9	28.3	0.72	65/104	135/82	388
HARD WHITE WHEAT									
Sacramento Valley	66.9	11.5	0.50	98.7	32.0	0.66	66/111	133/89	375
State Avg. 2021	66.9	11.5	0.50	98.7	32.0	0.66	66/111	133/89	375

PHYSICAL DOUGH QUALITY

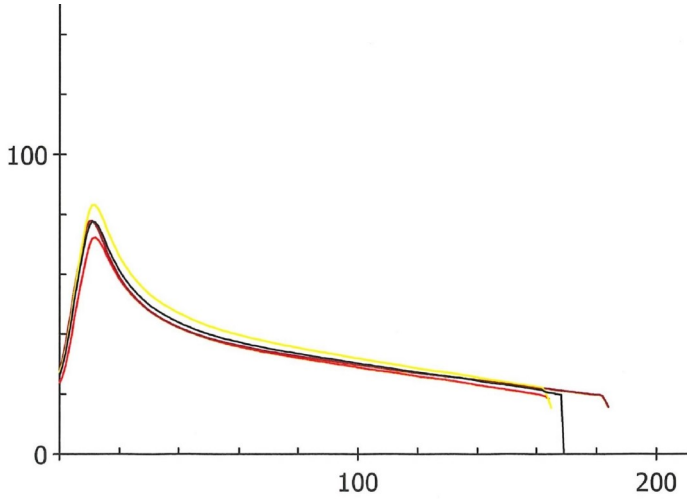
State and Region	Farinograph Absorption %	Farinograph Development Time MIN	Farinograph Stability MIN	Farinograph MTI B.U.	Alveograph P MM	Alveograph L MM	Alveograph P/L Ratio	Alveograph W Joules X 10^{-4}
HARD RED WINTER WHEAT								
Sacramento Valley	59.2	5.8	13.0	23	93	114	0.82	343
San Joaquin Valley	61.4	6.6	12.9	24	99	115	0.86	358
State Avg. 2021	60.3	6.2	12.9	23	96	114	0.84	350
HARD WHITE WHEAT								
Sacramento Valley	62.1	5.7	11.5	24	85	169	0.50	400
State Avg. 2021	62.1	5.7	11.5	24	85	169	0.50	400

2021 AVERAGE ALVEOGRAM

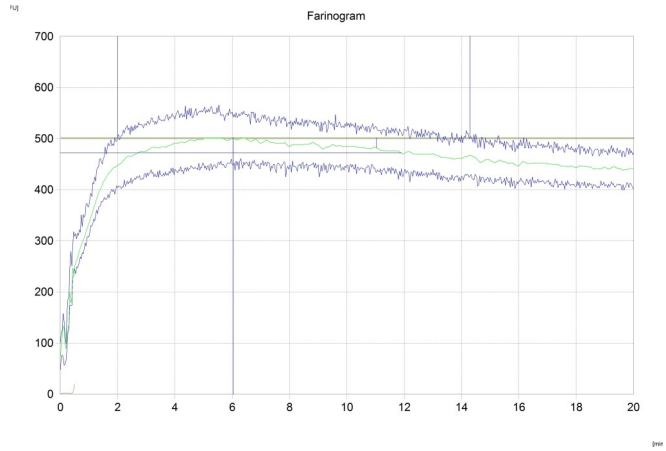
HARD RED WHEAT

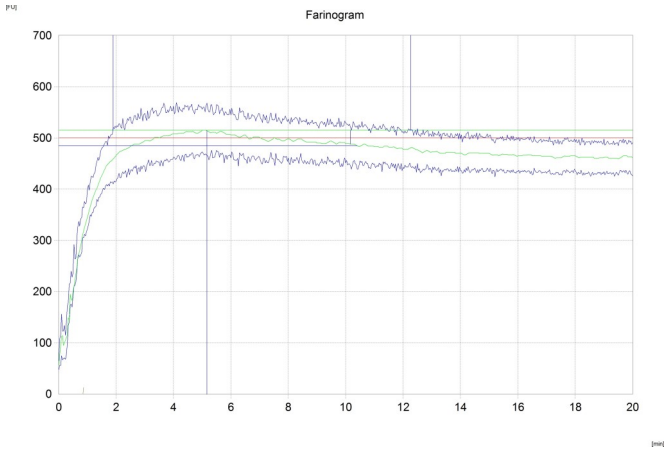


HARD WHITE WHEAT



2021 AVERAGE FARINOGRAM





BAKING QUALITY DATA

State and Region	Baking Absorption %	Loaf Volume CC	Dough Handling (1-10)	Crumb Color (1-10)	Crumb Grain (1-10)	Crumb Texture (1-10)	Bread Symmetry (1-10)
HARD RED WINTER WHEAT							
Sacramento Valley	62.4	920	6.6	7.6	6.5	6.7	6.7
San Joaquin Valley	63.5	924	6.5	8.2	6.0	6.3	6.8
State Avg. 2021	63.0	922	6.6	7.9	6.3	6.5	6.8
HARD WHITE WHEAT							
Sacramento Valley	64.5	875	6.0	4.0	5.0	5.0	5.0
State Avg. 2021	64.5	875	6.0	4.0	5.0	5.0	5.0

BREAD PHOTOS

2021 HARD RED VARIETY SPECIFIC INFORMATION

	AP-Octane	Cal Rojo	Joaquin Oro	Summit 515	
WHEAT	Sacramento Valley	Sacramento Valley	San Joaquin Valley	Sacramento Valley	San Joaquin Valley
Protein (12% MB)	11.0	12.0	12.4	11.6	12.4
Ash (12% MB)	1.36	1.38	1.54	1.43	1.45
Moisture (%)	9.0	9.0	6.9	9.1	9.0
Falling Number (sec)	300	299	376	282	321
Micro Sedimentation (cc)	43	59	46	47	41
Test Weight					
lb/bu	63.9	63.0	65.3	64.5	63.9
kg/hl	83.9	82.9	85.8	84.7	84.0
SKCS Hardness Score	65	62	65	69	69
1000 Kernel Weight (g)	41.5	42.5	45.5	44.2	42.8
Kernel Size Distribution					
Large/Medium/Small	88/12/0	88/12/0	94/6/0	92/8/0	88/12/0
FLOUR					
Lab Mill Yield (%)	68.0	68.7	68.3	67.4	67.8
Protein (14% MB)	9.8	10.7	11.5	10.3	11.3
Ash (14% MB)	0.44	0.45	0.41	0.41	0.46
Gluten Index	99	99	96	96	95
Wet Gluten (14% MB)	23	25	32	27	30
SRC*: GPI	0.70	0.76	0.71	0.69	0.73
Water/ 50% Sucrose	64/104	60/100	67/103	65/104	65/105
5%LacticAcid/5%NA_2CO_3	129/80	135/78	135/78	130/84	136/81
ALVEOGRAPH					
P (mm)	89	72	108	91	92
L (mm)	104	126	114	119	114
P/L ratio	0.86	0.57	0.95	0.76	0.81
W (10^{-4} Joules)	324	296	386	325	316
MIXOGRAPH					
Absorption (%)	55.9	56.4	64.5	60.4	61.0
Peak Time (min)	4.1	4.1	3.5	3.7	3.5
Work (%Torque*min)	172.9	172.7	144.1	144.2	147.8
Peak Height (mu)	50	53	55	47	52
M.T. Score (1-8)	5	4	4	3	3
FARINOGRAPH					
Absorption (%)	55.9	56.4	64.5	60.4	61.0
Peak Time (min)	5.0	6.3	6.3	4.3	5.8
Stability (min)	18.5	12.4	14.0	8.4	9.8
M.T.I.	9.0	23.5	28.0	29.0	31.5
BAKING RESULTS					
Baking Absorption (%)	60.0	60.5	65.5	62.7	64.3
Bread Volume (cc)	875	930	925	910	900
Crumb Grain & Texture	7.0	8.0	5.5	5.0	5.0

Wheat samples were collected by handlers. Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec, Lab mill yield: Brabender Quadromat Sr. Mill, modified in 1997; Bread Volume: AACCI Method 10-10B; Test weight conversion from lb/bu to kg/hl according to FGIS PN-97-5, {(1.292 x (lb/bu) + 1.419)}.

2021 HARD RED VARIETY SPECIFIC INFORMATION

	WB 9229		SY-Sienna	WB-9699	
WHEAT	Sacramento Valley	San Joaquin Valley	San Joaquin Valley	Sacramento Valley	San Joaquin Valley
Protein (12% MB)	11.9	11.7	12.5	12.1	11.9
Ash (12% MB)	1.50	1.45	1.62	1.48	1.36
Moisture (%)	9.1	8.8	8.1	8.6	7.8
Falling Number (sec)	358	356	372	378	398
Micro Sedimentation (cc)	57	57	39	54	50
Test Weight					
lb/bu	64.4	65.6	65.2	65.3	65.9
kg/hl	84.6	86.2	85.6	85.7	86.6
SKCS Hardness Score	76	74	56	69	67
1000 Kernel Weight (g)	38.9	43.3	46.1	42.1	46.3
Kernel Size Distribution					
Large/Medium/Small	82/18/0	88/12/0	94/6/0	90/10/0	96/4/0
FLOUR					
Lab Mill Yield (%)	67.1	66.9	70.2	66.6	66.5
Protein (14% MB)	10.8	10.8	11.0	10.9	11.0
Ash (14% MB)	0.53	0.48	0.44	0.49	0.43
Gluten Index	99	98	94	98	97
Wet Gluten (14% MB)	28	30	29	28	30
SRC*: GPI	0.71	0.72	0.74	0.73	0.73
Water/ 50% Sucrose	67/111	66/108	62/96	68/109	66/102
5%LacticAcid/5%NA_2CO_3	141/89	139/85	126/73	142/84	133/80
ALVEOGRAPH					
P (mm)	101	104	83	112	115
L (mm)	120	139	109	94	98
P/L ratio	0.84	0.75	0.76	1.19	1.17
W (10^{-4} Joules)	407	449	305	365	374
MIXOGRAPH					
Absorption (%)	61.3	62.9	58.8	59.9	60.4
Peak Time (min)	4.0	3.7	3.7	4.5	4.4
Work (%Torque*min)	168.4	156.1	157.2	184.2	185.1
Peak Height (mu)	53	53	52	52	55
M.T. Score (1-8)	4	4	3	5	5
FARINOGRAPH					
Absorption (%)	61.3	62.9	58.8	59.9	60.4
Peak Time (min)	6.7	7.0	6.7	7.0	8.0
Stability (min)	14.1	15.5	11.2	16.5	17.0
M.T.I.	24.5	14.0	31.0	18.0	7.0
BAKING RESULTS					
Baking Absorption (%)	64.8	63.5	60.5	62.8	63.0
Bread Volume (cc)	908	940	940	960	940
Crumb Grain & Texture	7.0	6.0	8.0	8.0	8.0

Wheat samples were collected by handlers. Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec, Lab mill yield: Brabender Quadromat Sr. Mill, modified in 1997; Bread Volume: AACCI Method 10-10B; Test weight conversion from lb/bu to kg/hl according to FGIS PN-97-5, {(1.292 x (lb/bu) + 1.419)}.

2021 HARD WHITE VARIETY SPECIFIC INFORMATION

	Patwin 515 HP
WHEAT	**Sacramento Valley**
Protein (12% MB)	12.8
Ash (14% MB)	1.45
Moisture (%)	8.7
Falling Number (sec)	364
Micro Sedimentation (cc)	65
Test Weight	
lb/bu	62.1
kg/hl	81.7
SKCS Hardness Score	81
1000 Kernel Weight (g)	33.1
Kernel Size Distribution	
Large/Medium/Small	61/39/0
FLOUR	
Lab Mill Yield (%)	66.9
Protein (14% MB)	11.5
Ash (14% MB)	0.50
Gluten Index	99
Wet Gluten (14% MB)	32
SRC*: GPI	0.66
Water/ 50% Sucrose	66/111
5% Lactic Acid/5% NA_2CO_3	133/89
ALVEOGRAPH	
P (mm)	85
L (mm)	169
P/L ratio	0.50
W (10^{-4} Joules)	400
MIXOGRAPH	
Absorption (%)	62.1
Peak Time (min)	3.1
Work (% Torque*min)	132.1
Peak Height (mu)	56
M.T. Score (1-8)	3
FARINOGRAPH	
Absorption (%)	62.1
Peak Time (min)	5.7
Stability (min)	11.5
M.T.I.	24.0
BAKING RESULTS	
Baking Absorption (%)	64.5
Bread Volume (cc)	875
Crumb Grain & Texture	5

Wheat samples were collected by handlers. Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec, Lab mill yield: Brabender Quadromat Sr. Mill, modified in 1997; Bread Volume: AACCI Method 10-10B; Test weight conversion from lb/bu to kg/hl according to FGIS PN-97-5, {(1.292 x (lb/bu) + 1.419)}.

HARD WHITE WHEAT

Patwin 515 HP (HWW) is a Hard White Spring wheat variety created by the introduction of the high grain protein content gene into Patwin-515. Patwin-515HP has similar height and heading as Patwin-515 and Blanca Grande-515, slightly better yield, and significantly higher grain protein content. Patwin-515HP has outstanding breadmaking quality and is immune to stripe rust and tolerant to BYDV and septoria tritici blotch. It is the recommended for irrigated fields in the Sacramento, San Joaquin and Imperial Valleys.

Technical and Laboratory Services

CWC Lab Assistant and Baker, Alejandra Andrade.

The California Wheat Commission laboratory has the equipment necessary for evaluation of common and durum wheat milling quality, flour chemical analysis, 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, product development, problem solving, quality control training, and research. The lab order test form is available on the California Wheat Commission website, please use when requesting services.

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 customers' 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 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.

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 hundreds of samples each year to support these programs and encourages the release of new varieties that will meet the customers' needs. New varieties are evaluated by commercial mills through the California Wheat Collaborator program.

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.

CWC Laboratory Manager Teng Vang
Photo credit: Matt Salvo, California Farm Bureau Federation

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California WHEAT COMMISSION