

California Crop Quality Report



2024 Hard Red Wheat / Hard White Wheat



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.

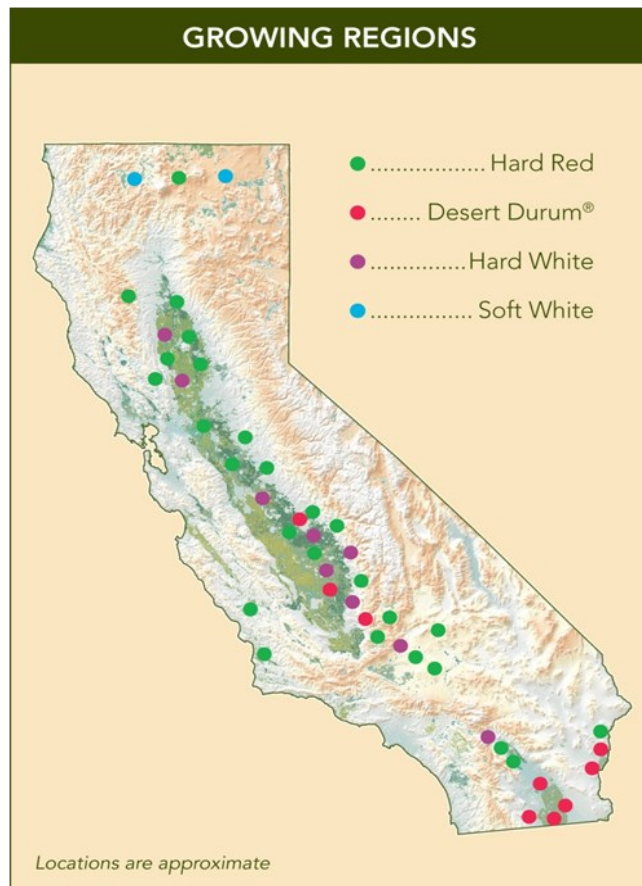
2024 Crop Conditions

Precipitation totals for the 2023-24 season were above average in the main wheat-growing regions of California. Across the season (October through June), average rainfall total in the San Joaquin Valley growing region was 11.7 inches (112% of the 10-year average). In the Sacramento Valley growing areas, average rainfall was 20.0 inches (109% of average). Precipitation during the early season (October through February), accounted for 78% of the seasonal total in the San Joaquin Valley and 86% of the seasonal total in the Sacramento Valley, and these were 111% and 117% of average, respectively. From March through June, rainfall totals were 96% of average in the Sacramento Valley and 131% of average in the San Joaquin Valley and maximum daily temperatures during this period were slightly cooler than normal. Overall, 2023-24 conditions led to productive crops across the state. According to USDA survey data, there was a small increase in wheat acres harvested for grain (despite a 10% reduction in planted acres), and average wheat yields increased slightly compared to the previous 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)
2024	167	185
2023	185	204
2022	155	171
2021	131	144
2020	208	230
2019	239	263
2018	231	255

*All common wheat (excluding Durum).

HARD RED WHEAT GRADE HARVEST DATA

	2024	2023	2022	2021	2020
Test Weight: lb/bu	65.0	65.0	63.0	63.1	62.9
kg/hl	85.4	85.4	82.8	83.0	82.7
Moisture (%)	9.3	9.4	9.6	9.6	9.2
Damaged (%)	0.0	0.0	0.0	0.0	0.0
Foreign Material* (%)	0.0	0.0	0.1	0.1	0.1
Shrunken/Broken* (%)	0.4	0.3	0.5	0.6	0.5
Total Defects (%)	0.4	0.4	0.6	0.7	0.6
Dockage* (%)	0.9	1.0	1.0	0.9	0.9
Total Screenings (%)	1.2	1.3	1.5	1.6	1.5
Net Wheat (%)	89.6	89.3	89.0	88.9	89.5
CTW (%)	106.6	106.4	105.9	105.9	106.5
MWVI (%)	93.8	94.0	94.4	94.4	93.9

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, $(1.292 \times \text{lb/bu}) + 1.419$. Net Wheat = $(100\% - (\text{FM} + \text{SHBN} + \text{Dockage})) \times (100\% - \text{Moisture}) / 100\%$. Clean, Tempered Wheat (CTW%) = $(100\% - (\text{FM} + \text{SHBN} + \text{Dockage})) \times (100\% - \text{Moisture}) / (100\% - 16\% (\text{temper moisture}))$. Millable Wheat Value Index (MWVI) = $100\% / \text{CTW}$.

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.

Yecora Rojo (HRS) has been produced in California since the early 1970's. It consistently ranks among the top hard red varieties.

WB 9725 (HRS) is an Awnless Hard Red Spring Wheat Variety for dual-purpose forage and grain use with excellent yield potential. This medium-late-maturity variety has very good standability and excellent tolerance to Yellow (Stripe) Rust.

WB-9727 (HRS) is a hard red spring wheat variety with excellent yield potential and very good protein content. This medium-late maturing variety is adapted for California's Sacramento Valley and has excellent milling and baking quality.

AP-Octane (HRS) is a hard red spring wheat variety 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. It is primarily adapted to Sacramento and San Joaquin Valleys. AP Octane has shown above average tolerance to current races of stripe rust.

WB-Joaquin (HRS) is adapted to the San Joaquin Valley and has high protein and test weight with excellent milling and baking properties.

Redwing (HRW) is a high quality wheat for both the Sacramento and San Joaquin Valleys, has been one of the top yielding hard red varieties in the university trials. Redwing receives high scores for grain, milling and baking qualities.

WB 9215 (HRS) is a Hard Red Spring Wheat variety with excellent yield potential. This medium-early-maturing variety also has excellent Yellow (Stripe) Rust tolerance and standability.

KERNEL QUALITY DATA

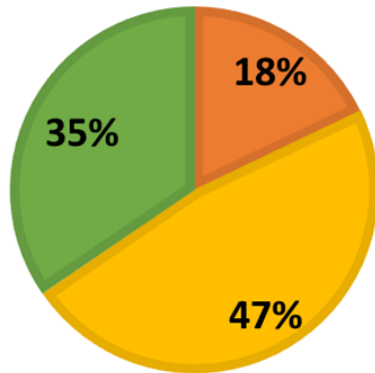
State and Region	Protein (12% moisture) %	Ash %	Moisture %	Falling Number SEC	Test Weight lbs/bu Kg/hL	SKCS Hardness Score	1000 Kernel Weight g	Kernel Size Distribution			Micro Sed CC	
								Large %	Medium %	Small %		
HARD RED WINTER WHEAT												
Sacramento Valley	12.0	1.51	8.9	357	65	85	63	45	95	5	0	51
San Joaquin Valley	12.8	1.59	7.3	361	64	84	61	43	93	7	0	44
State Avg. 2024	12.4	1.55	8.1	359	64	84	62	44	94	6	0	48

HARD WHITE WHEAT												
Sacramento Valley	12.1	1.55	8.5	366	64	85	68	43	90	10	0	51
State Avg. 2024	12.1	1.55	8.5	366	64	85	68	43	90	10	0	51

PROTEIN (12% MOISTURE)

STATE DISTRIBUTION

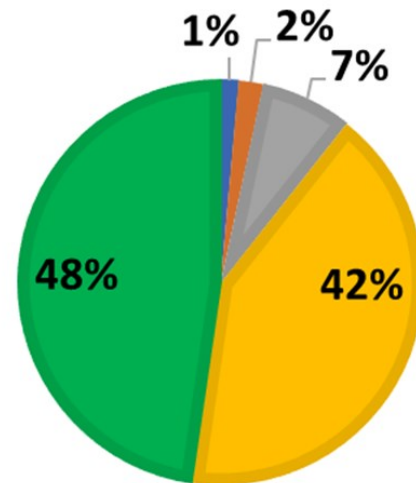
■ >12.5%
 ■ 11.0-12.4%
 ■ <10.9%



TEST WEIGHT (lbs/bu)

STATE DISTRIBUTION

■ <58
 ■ 58-59.9
 ■ 60-61.9
 ■ 62-63.9
 ■ >64



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 ₂ CO ₃	Falling Number SEC
Sacramento Valley	69.7	10.6	0.45	97	27	0.73	64/103	135/82	402
San Joaquin Valley	70.1	11.1	0.44	91	30	0.70	64/100	127/80	407
State Avg. 2024	69.9	10.8	0.45	94	28	0.72	64/102	131/81	405

HARD WHITE WHEAT									
Sacramento Valley	68.2	11.1	0.50	97	28	0.68	65/103	134/83	418
State Avg. 2024	68.2	11.1	0.50	97	28	0.68	65/103	134/83	418

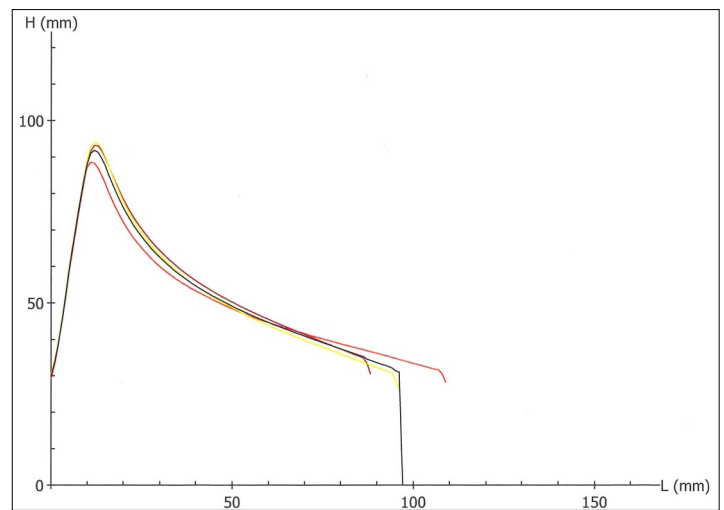
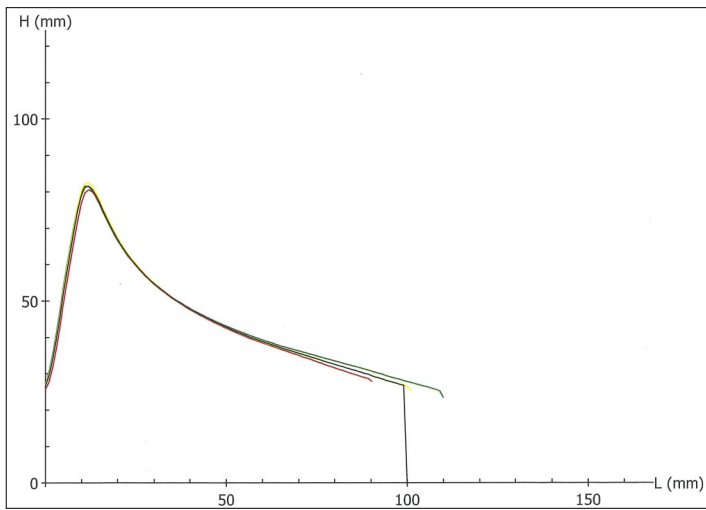
PHYSICAL DOUGH QUALITY

State and Region	Farinograph				Alveograph			
	Absorption %	Development Time MIN	Stability MIN	MTI B.U.	P MM	L MM	P/L Ratio	W Joules X 10 ⁻⁴
HARD RED WINTER WHEAT								
Sacramento Valley	60.7	6.0	13.1	23	93	90	1.07	294
San Joaquin Valley	61.1	6.7	13.0	26	86	108	0.85	298
State Avg. 2024	60.9	6.3	13.1	25	89	99	0.96	296
HARD WHITE WHEAT								
Sacramento Valley	62.0	6.3	11.0	30	103	95	1.13	326
State Avg. 2024	62.0	6.3	11.0	30	103	95	1.13	326

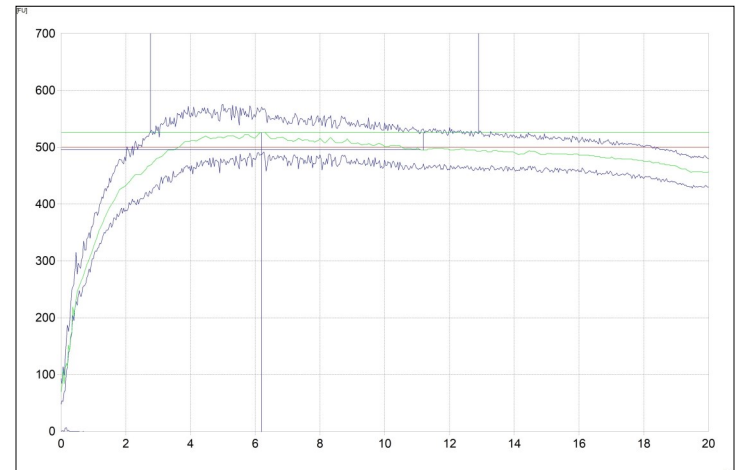
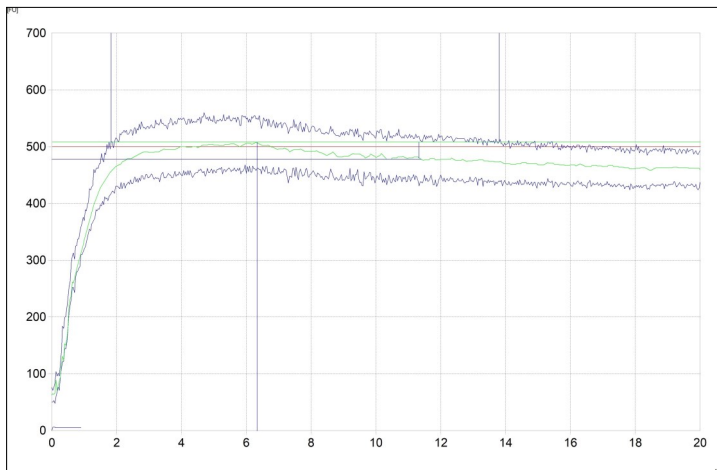
2024 AVERAGE ALVEOGRAM

HARD RED WHEAT

HARD WHITE WHEAT



2024 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	62.0	907	7.3	9.2	7.2	7.7	7.5
San Joaquin Valley	63.0	910	7.3	9.2	6.7	7.2	7.4
State Avg. 2024	62.5	908	7.3	9.2	6.9	7.4	7.5
HARD WHITE WHEAT							
Sacramento Valley	63.5	878	6.5	9.0	7.0	7.5	6.5
State Avg. 2024	63.5	878	6.5	9.0	7.0	7.5	6.5



2024 HARD RED VARIETY SPECIFIC INFORMATION

	AP Octane		Cal Rojo	Redwing	Summit 515	
	Sacramento Valley	San Joaquin Valley	San Joaquin Valley	Sacramento Valley	Sacramento Valley	San Joaquin Valley
WHEAT						
Protein (12% MB)	11.6	11.5	12.5	11.9	11.9	11.4
Ash (12% MB)	1.49	1.53	1.68	1.36	1.42	1.51
Moisture (%)	9.8	8.6	7.8	8.2	9.7	8.4
Falling Number (sec)	323	330	379	351	346	295
Micro Sedimentation (cc)	52	44	51	51	52	53
Test Weight						
lb/bu	65.2	65.6	64.1	64.2	64.2	64.4
kg/hl	85.6	86.1	84.2	84.3	84.3	84.7
SKCS Hardness Score	60	54	50	61	62	60
1000 Kernel Weight (g)	45	45	47	45	41	40
Kernel Size Distribution						
Large/Medium/Small	93/7/0	96/4/0	92/8/0	97/3/0	95/5/0	92/8/0
FLOUR						
Lab Mill Yield (%)	70.4	71.4	70.3	69.2	68.6	67.4
Protein (14% MB)	10.1	10.1	11.3	10.6	11.0	10.6
Ash (14% MB)	0.42	0.40	0.47	0.45	0.45	0.44
Gluten Index	99	99	97	95	93	90
Wet Gluten (14% MB)	24	25	29	27	30	29
SRC: GPI	0.75	0.73	0.72	0.69	0.72	0.69
Water/ 50% Sucrose (%)	62/100	62/95	59/101	67/110	65/106	62/102
5%LacticAcid/5%NA ₂ CO ₃ (%)	139/84	128/79	129/78	133/82	137/83	128/82
ALVEOGRAPH						
P (mm)	97	84	70	90	90	75
L (mm)	69	88	134	90	100	110
P/L ratio	1.41	0.95	0.52	1.00	0.90	0.68
W (10 ⁻⁴ Joules)	272	268	287	257	296	251
MIXOGRAPH						
Absorption (%)	57.7	57.4	59.3	62.7	62.0	61.0
Peak Time (min)	4.5	4.3	3.4	3.2	3.3	2.9
Work (%Torque*min)	159	159	135	123	131	108
Peak Height (mu)	41	43	48	47	50	46
M.T. Score (1-8)	5	5	4	3	4	3
FARINOGRAPH						
Absorption (%)	57.7	57.4	59.3	62.7	62.0	61.0
Peak Time (min)	7.2	6.9	5.4	3.5	4.7	4.0
Stability (min)	17.0	13.3	12.1	7.8	8.8	8.7
M.T.I.	18	26	21	32	23	23
BAKING RESULTS						
Baking Absorption (%)	59.1	58.5	60.0	63.9	62.7	63.4
Bread Volume (cc)	905	850	940	915	960	945
Dough Handling (1-10)	7	6	9	8	8	8
Crumb Grain & Texture (1-10)	8	7	8	8	9	7

Wheat samples were collected by handlers. Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec, Lab mill yield: Brabender Quadro-mat 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)}.

2024 HARD RED VARIETY SPECIFIC INFORMATION

	Joaquin	Joaquin Oro	Yecora Rojo
	San Joaquin Valley	San Joaquin Valley	San Joaquin Valley
WHEAT			
Protein (12% MB)	14.1	12.6	12.1
Ash (12% MB)	1.66	1.33	1.61
Moisture (%)	7.6	7.0	8.0
Falling Number (sec)	377	350	353
Micro Sedimentation (cc)	44	50	46
Test Weight			
lb/bu	63.1	64.0	64.9
kg/hl	82.9	84.1	85.2
SKCS Hardness Score	60	66	58
1000 Kernel Weight (g)	43	41	45
Kernel Size Distribution			
Large/Medium/Small	93/7/0	91/9/0	96/4/0
FLOUR			
Lab Mill Yield (%)	70.7	70.1	70.4
Protein (14% MB)	13.0	11.7	11.0
Ash (14% MB)	0.45	0.46	0.42
Gluten Index	73	91	97
Wet Gluten (14% MB)	38	32	27
SRC: GPI	0.75	0.71	0.70
Water/ 50% Sucrose (%)	65/98	67/107	63/100
5%LacticAcid/5%NA ₂ CO ₃ (%)	130/76	137/85	127/81
ALVEOGRAPH			
P (mm)	76	101	81
L (mm)	135	97	110
P/L ratio	0.57	1.04	0.74
W (10 ⁻⁴ Joules)	318	332	270
MIXOGRAPH			
Absorption (%)	65.9	64.3	60.3
Peak Time (min)	2.8	3.6	3.9
Work (%Torque*min)	117	148	146
Peak Height (mu)	57	51	47
M.T. Score (1-8)	3	4	4
FARINOGRAPH			
Absorption (%)	64.0	64.3	60.3
Peak Time (min)	7.3	11.7	6.0
Stability (min)	12.2	21.1	9.9
M.T.I.	30	13	30
BAKING RESULTS			
Baking Absorption (%)	65.4	64.0	61.3
Bread Volume (cc)	920	935	925
Dough Handling (1-10)	7	8	8
Crumb Grain & Texture (1-10)	6	8	9

Wheat samples were collected by handlers. Wheat and Flour Protein: Leco Combustion Nitrogen Analyzer Model TruSpec, Lab mill yield: Brabender Quadro-mat 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, $\{(1.292 \times (\text{lb/bu}) + 1.419)\}$.

2024 HARD RED VARIETY SPECIFIC INFORMATION

WHEAT	WB 9215	WB 9229		WB 9725		WB 9727
	San Joaquin Valley	Sacramento Valley	San Joaquin Valley	Sacramento Valley	San Joaquin Valley	Sacramento Valley
Protein (12% MB)	10.8	12.7	11.7	10.1	11.6	11.8
Ash (12% MB)	1.56	1.51	1.39	1.50	1.52	1.55
Moisture (%)	10.0	9.3	8.6	9.7	10.6	9.5
Falling Number (sec)	454	427	365	330	202	361
Micro Sedimentation (cc)	35	55	50	39	30	59
Test Weight						
lb/bu	65.9	65.7	66.1	64.1	64.2	66.1
kg/hl	86.6	86.4	86.8	84.3	84.4	86.8
SKCS Hardness Score	59	68	67	45	75	70
1000 Kernel Weight (g)	46	41	42	49	46	40
Kernel Size Distribution						
Large/Medium/Small	99/1/0	89/11/0	95/5/0	99/1/0	96/4/0	88/12/0
FLOUR						
Lab Mill Yield (%)	69.4	69.0	69.3	72.8	69.3	68.3
Protein (14% MB)	9.7	11.9	10.7	9.3	10.6	10.7
Ash (14% MB)	0.44	0.47	0.44	0.42	0.50	0.51
Gluten Index	99	98	98	99	82	100
Wet Gluten (14% MB)	24	31	28	22	29	26
SRC: GPI	0.65	0.73	0.74	0.74	0.56	0.76
Water/ 50% Sucrose (%)	65/100	67/106	68/108	58/87	63/94	67/108
5%LacticAcid/5%NA ₂ CO ₃ (%)	116/79	140/84	143/87	116/69	99/82	147/86
ALVEOGRAPH						
P (mm)	107	100	110	68	78	110
L (mm)	64	118	109	55	98	106
P/L ratio	1.67	0.85	1.01	1.24	0.80	1.04
W (10 ⁻⁴ Joules)	273	404	410	143	249	391
MIXOGRAPH						
Absorption (%)	60.0	63.4	63.4	56.7	61.6	61.4
Peak Time (min)	5.7	4.0	3.9	3.3	3.3	4.3
Work (%Torque*min)	206	166	160	109	126	175
Peak Height (mu)	40	51	52	39	48	48
M.T. Score (1-8)	2	5	5	2	4	5
FARINOGRAPH						
Absorption (%)	60.0	63.4	63.4	56.7	61.6	61.4
Peak Time (min)	6.9	7.7	7.2	5.6	4.5	7.0
Stability (min)	15.5	17.0	18.5	12.1	6.7	16.0
M.T.I.	19	17	21	30	49	20
BAKING RESULTS						
Baking Absorption (%)	64.1	64.7	64.4	58.2	64	63.3
Bread Volume (cc)	775	980	945	755	850	925
Dough Handling (1-10)	5	9	9	4	6	8
Crumb Grain & Texture (1-10)	5	9	9	4	6	8

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)}.

2024 HARD WHITE VARIETY SPECIFIC INFORMATION

WHEAT	Central White	Patwin 515
	Sacramento Valley	Sacramento Valley
Protein (12% MB)	12.2	11.5
Ash (14% MB)	1.53	1.44
Moisture (%)	9.4	9.0
Falling Number (sec)	368.0	384.0
Micro Sedimentation (cc)	53	50
Test Weight		
lb/bu	65	65
kg/hl	85	85
SKCS Hardness Score	66	70
1000 Kernel Weight (g)	46.5	40.3
Kernel Size Distribution		
Large/Medium/Small	88/12/0	90/10/0
FLOUR		
Lab Mill Yield (%)	68.2	68.3
Protein (14% MB)	11.4	10.7
Ash (14% MB)	0.48	0.52
Gluten Index	98	96
Wet Gluten (14% MB)	29	28
SRC: GPI	0.72	0.64
Water/ 50% Sucrose (%)	70/106	67/104
5% Lactic Acid/5% Na ₂ CO ₃ (%)	139/87	120/85
ALVEOGRAPH		
P (mm)	121	84
L (mm)	83	106
P/L ratio	1.46	0.79
W (10 ⁻⁴ Joules)	367	285
MIXOGRAPH		
Absorption (%)	62.1	61.8
Peak Time (min)	4.8	3.4
Work (% Torque*min)	175	127
Peak Height (mu)	44	48
M.T. Score (1-8)	5	3
FARINOGRAPH		
Absorption (%)	62.1	61.8
Peak Time (min)	7.7	4.8
Stability (min)	12.6	9.4
M.T.I.	33	27
BAKING RESULTS		
Baking Absorption (%)	63.7	63.3
Bread Volume (cc)	950	805
Dough Handling (1-10)	8	5
Crumb Grain & Texture (1-10)	9	6

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



UC Patwin 515



UC Central White

UC Patwin 515 (HWW) is a high yielding variety with high protein levels, and is adapted to both the Sacramento and San Joaquin Valleys. Patwin 515 is a variant of Patwin with the addition of stripe rust resistance genes *Yr5* and *Yr15*.

UC Central White (HWW) is a productive hard-white spring wheat variety with higher yield and improved breadmaking quality relative to Patwin-515HP. UC-Central White showed stable yields in trials with reduced water and in irrigated trials. UC Central White is well adapted to the Central Valley and performed significantly better than other HWS varieties in the intermountain region.

Technical and Laboratory Services



CWC Laboratory Manager 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 Director Teng Vang

Photo credit: Matt Salvo, California Farm Bureau Federation



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