

California Crop Quality Report



2022 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.

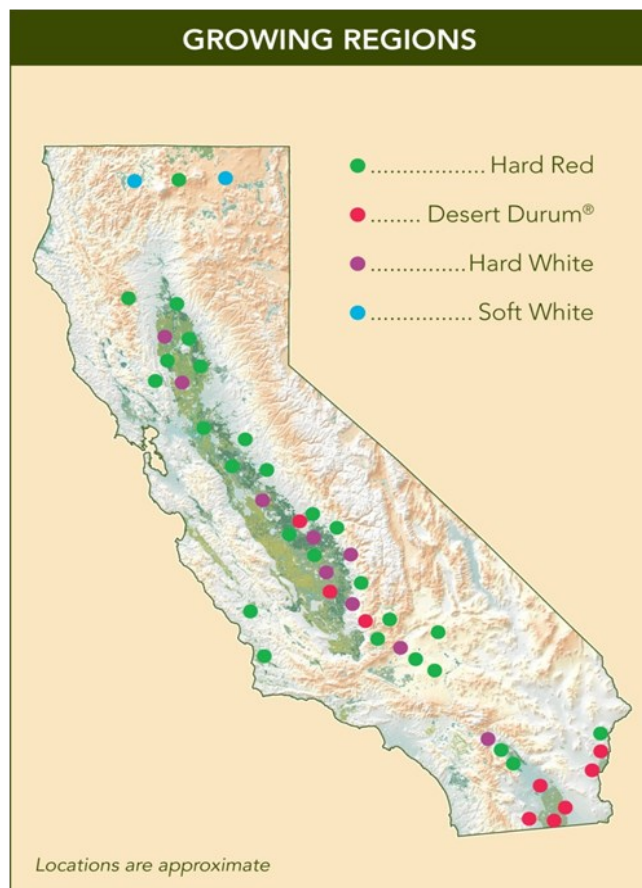
2022 Crop Conditions

The 2021-22 season began with higher precipitation than normal, with large storms in late-October and December bringing rainfall totals to above average for most locations in the Sacramento and San Joaquin Valleys by the end of December. Subsequently, there was little measurable precipitation through the middle of March, and below average precipitation between mid-March and the end of June. Thus, for the period between October 1 and March 1, rainfall in the Sacramento and San Joaquin Valleys was 108% and 104% of normal, respectively with most rain falling near sowing and as crops were young. Meanwhile, between March 1 and June 30, totals were 31% and 46% of normal in the Sacramento and San Joaquin Valleys, respectively. In addition, there was a rainfall event in early June of 0.1-0.3 inches throughout much of the Sacramento Valley as crops were mature or close to maturity. Taken together, the abnormally dry conditions during the second half the season likely had a negative impact on grain yield and quality for locations without irrigation or with irrigation less than crop demand. In addition, the late rainfall in June is likely to have had a negative impact on falling numbers for crops in the Sacramento Valley. Fully irrigated sites, particularly those in the San Joaquin Valley are less likely to have been affected by these factors.

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)
2022	155	171
2021	131	144
2020	208	230
2019	239	263
2018	231	255
2017	270	299
2016	361	398

*All common wheat (excluding Durum).

HARD RED WHEAT GRADE HARVEST DATA

	2022	2021	2020	2019	2018
Test Weight: lb/bu	63.0	63.1	62.9	62.5	62.6
kg/hl	82.8	83.0	82.7	82.2	82.3
Moisture (%)	9.6	9.6	9.2	8.6	9.6
Damaged (%)	0.0	0.0	0.0	0.1	0.1
Foreign Material* (%)	0.1	0.1	0.1	0.1	0.1
Shrunken/Broken* (%)	0.5	0.6	0.5	0.7	0.8
Total Defects (%)	0.6	0.7	0.6	0.8	1.0
Dockage* (%)	1.0	0.9	0.9	1.1	1.1
Total Screenings (%)	1.5	1.6	1.5	1.9	2.0
Net Wheat (%)	89.0	88.9	89.5	89.7	88.6
CTW (%)	105.9	105.9	106.5	106.8	105.5
MWVI (%)	94.4	94.4	93.9	93.6	94.8

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.

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 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-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.

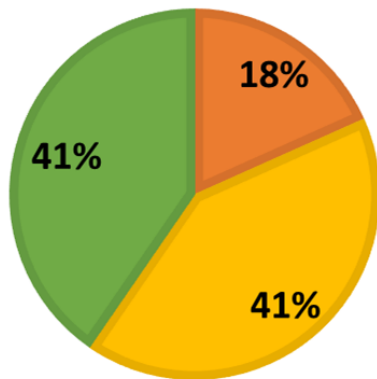
KERNEL QUALITY DATA

State and Region	Protein (12% moisture) %	Ash %	Moisture %	Falling Number SEC	Test Weight lbs/bu Kg/hL	SKCS Hardness Score	1000 Kernel Weight g	Kernel Size Distribution			Micro Sed CC	
								Large %	Medium %	Small %		
HARD RED WINTER WHEAT												
Sacramento Valley	11.3	1.43	8.1	331	63.7	83.7	61.0	42.0	90	10	0	42
San Joaquin Valley	11.7	1.47	7.7	344	64.4	84.6	64.0	43.6	92	8	0	41
State Avg. 2022	11.5	1.45	7.9	338	64.0	84.2	62.5	42.8	91	9	0	42

HARD WHITE WHEAT												
Sacramento Valley	12.2	1.59	8.1	422	62.6	82.2	69.6	36.0	78	21	1	42
State Avg. 2022	12.2	1.59	8.1	422	62.6	82.2	69.6	36.0	78	21	1	42

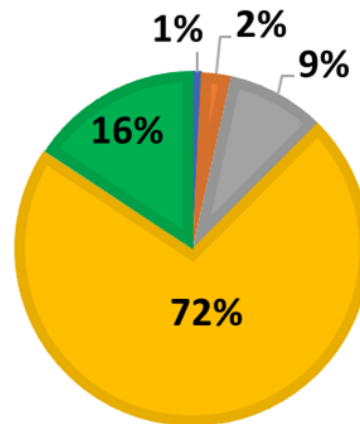
PROTEIN (12% MOISTURE)
STATE DISTRIBUTION

■ >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
HARD RED WINTER WHEAT									
Sacramento Valley	68.7	9.8	0.44	95.7	26.3	0.70	67/105	133/86	399
San Joaquin Valley	69.4	10.5	0.42	92.6	31.0	0.70	67/103	132/85	406
State Avg. 2022	69.0	10.2	0.43	94.1	28.6	0.70	67/104	133/86	403

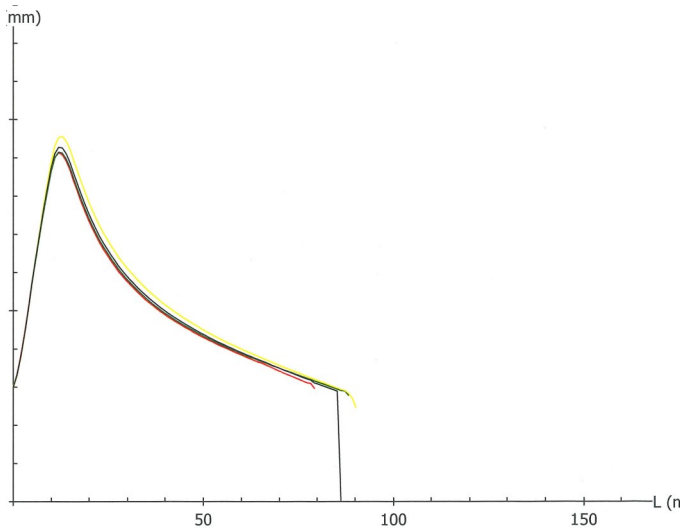
HARD WHITE WHEAT									
Sacramento Valley	66.8	10.8	0.47	89.0	30.6	0.64	66/100	119/85	425
State Avg. 2022	66.8	10.8	0.47	89.0	30.6	0.64	66/100	119/85	425

PHYSICAL DOUGH QUALITY

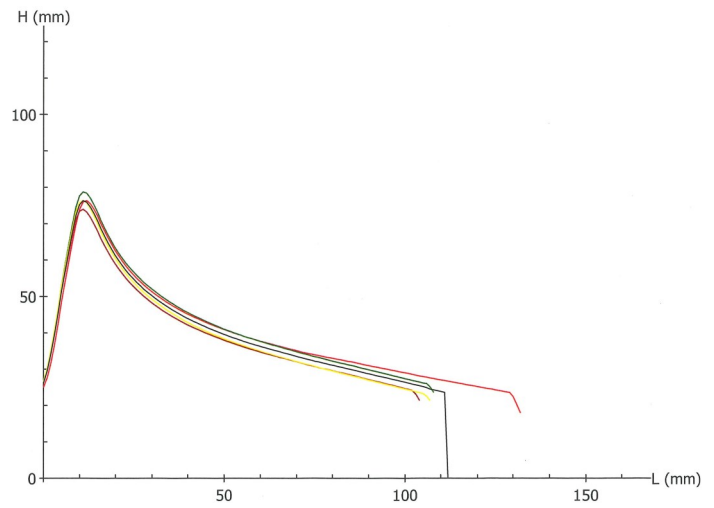
State and Region	Farinograph				Alveograph			
	Absorption %	Development Time MIN	Stability MIN	MTI B.U.	P MM	L MM	P/L Ratio	W Joules X 10 ⁻⁴
HARD RED WINTER WHEAT								
Sacramento Valley	63.8	5.8	11.6	26	103	85	1.21	295
San Joaquin Valley	65.5	5.9	12.9	18	108	84	1.29	304
State Avg. 2022	64.6	5.8	12.3	22	105	84	1.25	299
HARD WHITE WHEAT								
Sacramento Valley	64.3	5.8	12.9	16	86	111	0.77	307
State Avg. 2022	64.3	5.8	12.9	16	86	111	0.77	307

2022 AVERAGE ALVEOGRAM

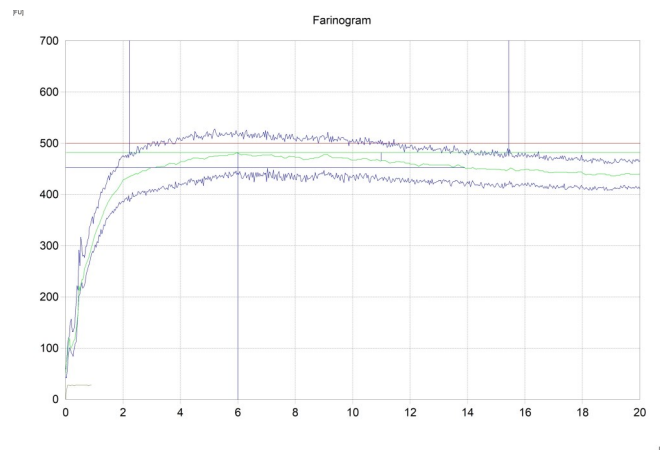
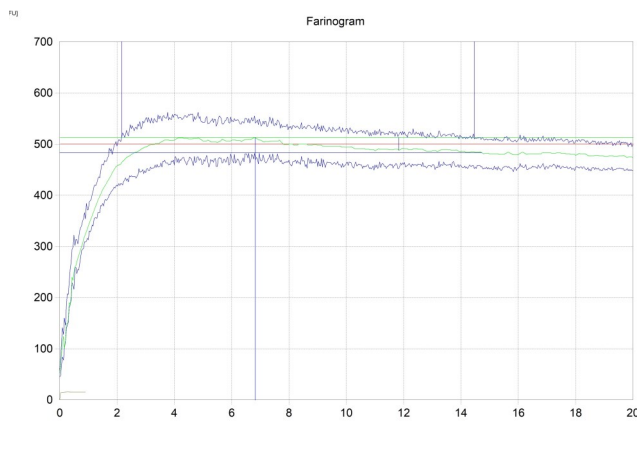
HARD RED WHEAT



HARD WHITE WHEAT



2022 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	65.5	857	5.6	8.0	6.3	7.0	5.8
San Joaquin Valley	65.7	880	5.0	8.0	5.3	6.3	6.0
State Avg. 2022	65.6	868	5.3	8.0	5.8	6.7	5.9
HARD WHITE WHEAT							
Sacramento Valley	63.5	838	5.0	8.0	5.0	5.5	5.5
State Avg. 2022	63.5	838	5.0	8.0	5.0	5.5	5.5



2022 HARD RED VARIETY SPECIFIC INFORMATION

	AP-Octane	Cal Rojo	Joaquin Oro	Summit 515	
	Sacramento Valley	Sacramento Valley	San Joaquin Valley	Sacramento Valley	San Joaquin Valley
WHEAT					
Protein (12% MB)	12.2	12.1	12.7	10.6	11.1
Ash (12% MB)	1.45	1.46	1.46	1.34	1.41
Moisture (%)	7.4	9.0	7.2	7.8	8.3
Falling Number (sec)	395	484	360	256	298
Micro Sedimentation (cc)	46	40	41	37	43
Test Weight					
lb/bu	62.8	60.4	65.3	64.0	63.3
kg/hl	82.5	79.4	85.7	84.1	83.2
SKCS Hardness Score	53	52	60	61	71
1000 Kernel Weight (g)	42.2	44.3	46.5	41.8	37.6
Kernel Size Distribution					
Large/Medium/Small	91/9/0	87/13/0	97/3/0	94/6/0	88/12/0
FLOUR					
Lab Mill Yield (%)	70.2	68.9	70.0	66.6	69.9
Protein (14% MB)	10.9	10.8	11.4	9.4	9.9
Ash (14% MB)	0.41	0.47	0.37	0.40	0.47
Gluten Index	97	99	90	92	96
Wet Gluten (14% MB)	29	27	33	24	29
SRC: GPI	0.80	0.75	0.71	0.68	0.69
Water/ 50% Sucrose (%)	63/96	62/100	70/104	67/103	70/109
5%LacticAcid/5%NA ₂ CO ₃ (%)	141/79	131/75	134/85	129/86	136/89
ALVEOGRAPH					
P (mm)	79	83	113	95	96
L (mm)	115	123	97	70	75
P/L ratio	0.69	0.67	1.16	1.36	1.28
W (10 ⁻⁴ Joules)	309	325	347	225	257
MIXOGRAPH					
Absorption (%)	61.2	60.0	68.4	63.9	63.0
Peak Time (min)	4.1	3.8	2.9	3.0	4.0
Work (%Torque*min)	168	154	122	117	149
Peak Height (mu)	51	50	57	47	45
M.T. Score (1-8)	4	3	3	3	3
FARINOGRAPH					
Absorption (%)	61.2	59.6	67.9	63.9	63.0
Peak Time (min)	7.4	6.0	7.5	5.1	5.3
Stability (min)	14.0	13.2	16.7	10.9	9.8
M.T.I.	25	16	8	25	32
BAKING RESULTS					
Baking Absorption (%)	62.5	60.5	68.0	64.0	63.5
Bread Volume (cc)	880	900	925	840	865
Crumb Grain & Texture (1-10)	8.0	9.0	7.0	7.0	7.0

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

2022 HARD RED VARIETY SPECIFIC INFORMATION

WHEAT	WB 9229		WB 9699	WB 9727
	Sacramento Valley	San Joaquin Valley	Sacramento Valley	Sacramento Valley
Protein (12% MB)	11.2	11.8	10.3	11.2
Ash (12% MB)	1.47	1.46	1.42	1.58
Moisture (%)	7.8	7.6	8.1	8.2
Falling Number (sec)	416	397	337	453
Micro Sedimentation (cc)	44	44	45	43
Test Weight				
lb/bu	64.8	65.9	65.0	65.7
kg/hl	85.1	86.6	85.4	86.3
SKCS Hardness Score	68	64	68	70
1000 Kernel Weight (g)	39.1	44.1	42.7	39.5
Kernel Size Distribution				
Large/Medium/Small	88/12/0	94/6/0	91/9/0	86/14/0
FLOUR				
Lab Mill Yield (%)	69.9	71.3	68.7	70.7
Protein (14% MB)	9.9	10.8	9.2	9.8
Ash (14% MB)	0.47	0.45	0.48	0.48
Gluten Index	96	93	99	99
Wet Gluten (14% MB)	29	31	23	29
SRC: GPI	0.69	0.72	0.62	0.70
Water/ 50% Sucrose (%)	70/109	66/101	71/115	68/105
5%LacticAcid/5%NA ₂ CO ₃ (%)	136/89	133/84	133/97	137/90
ALVEOGRAPH				
P (mm)	119	114	124	118
L (mm)	77	81	73	87
P/L ratio	1.55	1.41	1.70	1.36
W (10 ⁻⁴ Joules)	331	307	320	365
MIXOGRAPH				
Absorption (%)	65.4	66.6	66.0	64.2
Peak Time (min)	4.3	2.9	4.2	4.2
Work (%Torque*min)	171	114	165	167
Peak Height (mu)	47	51	47	48
M.T. Score (1-8)	4	2	3	4
FARINOGRAPH				
Absorption (%)	65.6	65.9	66.0	64.3
Peak Time (min)	5.3	4.9	6.5	6.5
Stability (min)	10.6	11.5	12.8	11.0
M.T.I.	33	17	25	31
BAKING RESULTS				
Baking Absorption (%)	65.0	65.5	65.5	65.0
Bread Volume (cc)	863	850	830	855
Crumb Grain & Texture (1-10)	7.0	6.0	5.0	6.0

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

2022 HARD WHITE VARIETY SPECIFIC INFORMATION

WHEAT	Patwin 515	Patwin 515 HP
	Sacramento Valley	Sacramento Valley
Protein (12% MB)	12.2	12.3
Ash (14% MB)	1.50	1.48
Moisture (%)	7.5	7.8
Falling Number (sec)	398	421
Micro Sedimentation (cc)	40	43
Test Weight		
lb/bu	63.0	63.2
kg/hl	82.9	83.1
SKCS Hardness Score	64	68
1000 Kernel Weight (g)	38.3	35.6
Kernel Size Distribution		
Large/Medium/Small	86/14/0	80/20/0
FLOUR		
Lab Mill Yield (%)	66.7	66.9
Protein (14% MB)	10.7	10.8
Ash (14% MB)	0.48	0.47
Gluten Index	85	93
Wet Gluten (14% MB)	31	30
SRC: GPI	0.63	0.65
Water/ 50% Sucrose (%)	64/98	67/102
5% Lactic Acid/5% Na ₂ CO ₃ (%)	115/85	122/85
ALVEOGRAPH		
P (mm)	84	88
L (mm)	94	128
P/L ratio	0.89	0.69
W (10 ⁻⁴ Joules)	258	356
MIXOGRAPH		
Absorption (%)	64.3	64.2
Peak Time (min)	2.7	3.0
Work (% Torque*min)	107	128
Peak Height (mu)	53	55
M.T. Score (1-8)	2	3
FARINOGRAPH		
Absorption (%)	64.3	64.2
Peak Time (min)	6.8	4.8
Stability (min)	12.3	13.5
M.T.I.	25.0	7.0
BAKING RESULTS		
Baking Absorption (%)	63.5	63.5
Bread Volume (cc)	855	820
Crumb Grain & Texture (1-10)	6	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)}.



Patwin 515



Patwin 515 HP

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*.

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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