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Courtesy of the Idaho Wheat Commission*



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Courtesy of the Idaho Wheat Commission*

U.S. PACIFIC NORTHWEST

2020 HARVEST

SOFT WHITE

WHEAT

QUALITY REPORT

Project is funded by

Idaho Wheat Commission | Oregon Wheat Commission | Washington Grain Commission

U.S. Wheat Associates | Wheat Marketing Center

PACIFIC NORTHWEST EXECUTIVE SUMMARY

The Pacific Northwest (PNW) experienced excellent growing conditions in the 2020 crop year, which resulted in a wheat crop with very good yields and quality. In general, the crop had lower protein and moisture and consistent U.S. grades. Production of soft white (SW) and white club (WC) wheat hit a new record of 7.2 MMT. The overall quality is characterized by very weak to medium gluten strength with excellent potential to produce soft wheat flour products and other products made from blends of soft and hard wheat. Average SW and WC test weights are higher than 2019 with good falling number values and kernel characteristics. Flour characteristics align with protein contents and show good color and falling number values with slightly lower flour yield than the 5-year average. Farinograph water absorptions are desirably low for both SW and WC with weak to medium gluten characteristics for SW and very weak gluten for WC.

Finished product quality aligned with protein content, with low protein composites producing good sponge cake total scores and cookie diameters and higher protein composites showing good total scores for Chinese southern-style steamed breads.

Please note that we have made several formatting changes to this year's report. Let us know what you think by sending your comments to: info@wmcinc.org.



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PACIFIC NORTHWEST SOFT WHITE WHEAT—CLASS & SUBCLASSES

U.S. soft white wheat is grown in the Pacific Northwest, which includes the states of Idaho, Oregon, and Washington.

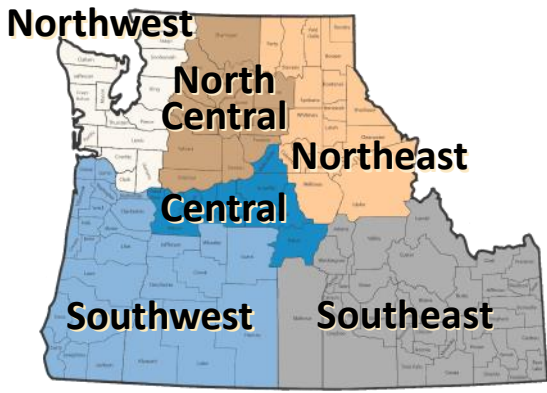
Pacific Northwest soft white wheat is valued for its white bran, low moisture content, and weak gluten characteristics. Consequently, SW is well suited for products such as cakes, cookies, pancakes, and snack foods. Wheat with stronger gluten can be used in crackers, flat breads, and Chinese southern-type steamed breads by itself or in blends with hard wheat.

The soft white wheat class includes the subclasses of white club wheat and western white wheat. White club wheat has very weak gluten characteristics. Western white wheat is a blend of white club and soft white wheat. The amount of white club wheat in western white ranges from 10 to 90 percent. The minimum percentage of white club in western white is 10 percent; higher amounts are determined by contract specifications negotiated between buyers and sellers (typically 10-30%).



SOFT WHITE AND WHITE CLUB WHEAT SUMMARY				
	Soft White		White Club	
	2020	5 yr av	2020	5 yr av
Test Weight (lb/bu)	61.9	60.9	61.6	60.0
Hectoliter Weight (kg/hl)	81.4	80.1	81.0	78.9
Grade	1SWH	1SWH	1WHCB	1WHCB
Dockage (%)	0.5	0.5	0.5	0.6
Wheat Moisture (%)	9.2	9.2	8.5	8.5
Wheat Protein (% , 12% mb)	9.8	10.0	9.8	10.1
Wheat Ash (% , 14% mb)	1.35	1.36	1.27	1.30
1000 Kernel Weight (g , 14% mb)	36.3	34.9	32.3	30.8
Wheat Falling Number (seconds , 14% mb)	323	327	322	342
Flour Extraction (%)	72.6	73.1	74.7	73.9
Flour Ash (% , 14% mb)	0.43	0.43	0.48	0.45
Flour Wet Gluten (% , 14% mb)	22.3	23.6	13.1	21.5
Farinograph: Absorption (% , 14% mb)	52.2	52.8	49.2	51.2
Peak Time (minutes)	1.9	2.5	1.3	1.6
Stability Time (minutes)	2.3	2.8	1.1	1.4
Alveograph: L (mm)	112	101	101	76
W (10 ⁻⁴ joules)	94	91	37	43
Production (mmt)	6.94	5.47	0.26	0.32

Production Zones



2020 SOFT WHITE AND WHITE CLUB WHEAT PRODUCTION		
Production Zone	Million Metric Tons (mmt)	Million Bushels
North Central	2.16	79.3
Northeast	2.44	89.8
Central	1.44	52.9
Southeast	0.83	30.4
Southwest	0.29	10.6
Northwest	0.04	1.3
Total	7.20	264.3

Source: USDA Small Grains Summary, NASS 9/30/20, and Washington Grain Commission 10/1/20.

Weather & Production

The Pacific Northwest (PNW) had excellent growing conditions for the 2020 soft white wheat (SW) crop. There was adequate soil moisture at planting, and while most of the area received above average rainfall during winter and spring, some areas of the PNW had less moisture. Spring planting conditions were ideal leading to excellent spring wheat growing conditions. Timely May /June rains produced generally excellent yields. Yields for both winter and spring wheat were above average in Washington and Idaho and average in Oregon. USDA estimates total 2020 PNW SW production at 7.2 MMT, which is a record for the region. Of that, white club (WC) is estimated to account for 0.26 MMT.



Photo courtesy of Washington Grain Commission



Photo by Lindsay Murdoch. Courtesy of Oregon Wheat Commission

Wheat Samples

At harvest, wheat samples were collected from a number of sources, including state and private grain inspection agencies and commercial wheat handling operations throughout the Pacific Northwest. Sample collection was based on wheat production in each location. For the 2020 harvest, Wheat Marketing Center (WMC) received and tested 389 SW and 95 WC samples from Idaho, Oregon, and Washington. Federal Grain Inspection Service (FGIS) graded and ran wheat protein on each sample. WMC conducted wheat, flour, solvent retention capacity (SRC), dough, and finished product tests on composites based on production zones and protein levels.

The top SW varieties planted in Washington were UI Magic CL+, Curiosity CL+, Northwest Duet, Ryan and Otto. Oregon's top SW varieties were UI Magic CL+, SY Assure and Norwest Tandem. Idaho's top SW winter varieties were SY Ovation and UI Magic CL+; the top SW spring variety was Seahawk. ARS Crescent was the top white club variety planted in the PNW.

WHEAT QUALITY

Production Zone	Wheat Protein Range 12% mb %	Grade	Test Weight lb/bu	Dockage %	Whole Kernel Moisture %	Wheat Falling Number 14% mb sec	Wheat Ash 14% mb %	Thousand Kernel Weight 14% mb g	SKCS Kernel Hardness Index	Whole Meal Wet Gluten 14% mb %
North Central	<8.5	1SWH	61.6	0.3	8.9	312	1.25	35.0	31	17.2
	8.5-9.4	1SWH	62.2	0.4	8.9	319	1.23	35.0	33	21.2
	9.5-10.4	1SWH	62.6	0.4	8.9	330	1.23	35.4	34	23.9
	10.5-12.0	1SWH	62.0	0.6	8.8	354	1.32	35.3	32	29.0
	>12.0	1SWH	61.7	0.6	10.1	342	1.30	35.6	29	30.7
	2020 Average	1SWH	62.2	0.5	8.9	334	1.26	35.3	32	24.6
	2019 Average	1SWH	61.7	0.4	9.4	311	1.27	35.0	25	25.3
	5 Year Average	1SWH	61.0	0.4	8.8	329	1.28	33.7	30	22.9
Northeast	<8.5	1SWH	62.3	0.3	10.2	320	1.33	38.4	28	17.2
	8.5-9.4	1SWH	62.9	0.7	9.6	333	1.37	39.1	32	19.6
	9.5-10.4	1SWH	63.3	0.3	9.7	328	1.29	38.0	35	23.3
	2020 Average	1SWH	62.9	0.5	9.8	329	1.33	38.6	33	20.5
	2019 Average	1SWH	62.4	0.5	9.9	321	1.32	36.2	23	23.7
	5 Year Average	1SWH	61.5	0.5	9.1	331	1.34	35.3	28	22.4
Central	<8.5	1SWH	61.8	0.5	9.1	301	1.28	37.6	31	17.6
	8.5-9.4	1SWH	62.1	0.5	8.6	322	1.35	34.6	33	22.4
	9.5-10.4	1SWH	62.3	0.5	8.9	335	1.36	35.9	33	25.0
	10.5-12.0	1SWH	61.9	0.8	9.0	352	1.34	35.7	37	28.7
	>12.0	1SWH	60.3	0.9	8.7	352	1.43	32.0	37	34.2
	2020 Average	1SWH	62.0	0.6	8.8	333	1.35	35.3	34	25.0
	2019 Average	1SWH	61.3	0.5	10.1	311	1.34	35.9	21	24.5
	5 Year Average	1SWH	60.3	0.6	9.1	329	1.30	33.6	29	23.3
Southeast	8.5-9.4	1SWH	61.7	0.4	9.1	311	1.54	37.7	26	19.2
	9.5-10.4	1SWH	61.3	0.6	9.4	318	1.54	37.7	30	22.9
	10.5-12.0	1SWH	61.3	0.6	9.6	322	1.56	37.3	38	24.3
	2020 Average	1SWH	61.4	0.5	9.4	318	1.55	37.5	32	22.4
	2019 Average	1SWH	61.3	0.4	10.5	326	1.55	40.3	27	21.6
	5 Year Average	1SWH	61.2	0.5	9.9	332	1.51	38.5	30	20.1
Southwest	<8.5	2SWH	59.2	0.4	10.7	320	1.41	37.6	24	17.8
	8.5-9.4	3SWH	57.7	0.7	10.7	308	1.41	39.4	30	19.5
	9.5-10.4	2SWH	59.8	0.5	10.3	331	1.52	37.1	30	23.2
	2020 Average	2SWH	58.9	0.5	10.6	320	1.45	38.0	28	20.1
	2019 Average	2SWH	59.0	0.5	11.5	300	1.41	39.5	16	18.5
	5 Year Average	1SWH	60.5	0.6	10.8	338	1.39	38.3	26	18.6
White Club Wheat	2020 Average	1WHCB	61.6	0.5	8.5	322	1.27	32.3	31	18.0
	2019 Average	1WHCB	60.6	0.8	9.3	314	1.29	31.0	21	21.5
	5 Year Average	1WHCB	60.2	0.7	8.7	328	1.28	31.1	30	18.7



FLOUR QUALITY

Production Zone	Wheat Protein Range 12% mb %	Flour Yield %	Flour Ash 14% mb %	Flour Protein 14% mb %	Flour Color			Flour Wet Gluten 14% mb %	Flour Falling Number 14% mb sec	Amylograph Peak Viscosity BU
					L*	a*	b*			
North Central	<8.5	72.7	0.44	7.4	92.9	-2.2	8.3	16.9	324	404
	8.5-9.4	72.3	0.41	8.1	93.1	-2.2	8.4	19.8	332	494
	9.5-10.4	73.1	0.40	9.2	92.7	-2.3	8.2	21.6	346	476
	10.5-12.0	71.8	0.43	10.4	92.7	-2.0	8.0	26.6	335	511
	>12.0	70.3	0.42	11.3	92.8	-2.0	8.0	29.6	338	497
	2020 Average	72.3	0.42	9.3	92.8	-2.2	8.2	22.7	337	486
	2019 Average	71.6	0.43	9.2	92.8	-2.1	8.4	22.9	338	499
5 Year Average	73.4	0.41	9.0	92.8	-2.2	8.0	22.5	358	488	
Northeast	<8.5	74.4	0.45	7.2	92.4	-2.4	9.3	14.8	325	427
	8.5-9.4	74.4	0.42	8.0	92.5	-2.2	8.6	18.2	334	441
	9.5-10.4	74.5	0.39	8.4	92.4	-2.1	8.5	19.7	333	488
	2020 Average	74.4	0.42	8.0	92.4	-2.2	8.7	18.1	332	456
	2019 Average	73.3	0.45	8.7	92.5	-2.1	8.5	21.7	342	446
	5 Year Average	74.4	0.43	8.7	92.6	-2.1	7.9	22.2	362	479
Central	<8.5	72.7	0.40	7.4	92.7	-2.2	8.3	17.5	303	310
	8.5-9.4	73.1	0.41	7.7	92.9	-2.1	8.0	20.0	337	460
	9.5-10.4	72.8	0.43	9.0	92.7	-2.0	7.8	22.5	319	447
	10.5-12.0	71.6	0.42	10.0	92.7	-1.9	7.6	27.1	356	534
	>12.0	69.7	0.43	11.9	92.4	-1.8	7.3	36.4	319	617
	2020 Average	72.4	0.42	8.9	92.7	-2.0	7.8	23.4	329	468
	2019 Average	72.3	0.45	8.7	92.5	-2.0	8.0	22.7	336	534
5 Year Average	73.4	0.43	8.9	92.7	-2.1	7.9	23.7	358	527	
Southeast	8.5-9.4	73.6	0.44	8.1	92.7	-2.0	7.8	16.7	312	449
	9.5-10.4	74.0	0.47	9.0	92.5	-2.0	7.8	22.6	319	449
	10.5-12.0	74.0	0.47	9.9	92.3	-2.0	8.0	24.3	318	406
	2020 Average	73.9	0.46	9.1	92.5	-2.0	7.9	21.6	316	432
	2019 Average	75.1	0.48	8.5	93.0	-2.1	7.7	22.2	355	447
5 Year Average	75.4	0.49	8.7	92.8	-2.1	7.6	22.7	367	459	
Southwest	<8.5	70.4	0.49	7.0	92.5	-2.3	8.9	15.5	318	286
	8.5-9.4	73.1	0.47	7.9	92.2	-2.3	9.3	16.5	323	309
	9.5-10.4	72.8	0.53	9.0	92.2	-2.1	8.4	26.7	330	295
	2020 Average	72.0	0.50	7.9	92.3	-2.2	8.9	19.4	324	296
	2019 Average	73.5	0.52	7.3	92.5	-1.9	7.4	19.2	316	385
	5 Year Average	75.3	0.48	7.7	92.5	-2.2	7.8	17.8	352	496
White Club Wheat	2020 Average	74.7	0.48	8.9	92.6	-2.0	8.0	13.1	365	439
	2019 Average	72.8	0.48	8.9	92.6	-2.3	8.2	21.2	347	523
	5 Year Average	74.3	0.42	8.8	92.2	-2.1	7.8	20.9	358	486

SOLVENT RETENTION CAPACITY (SRC)

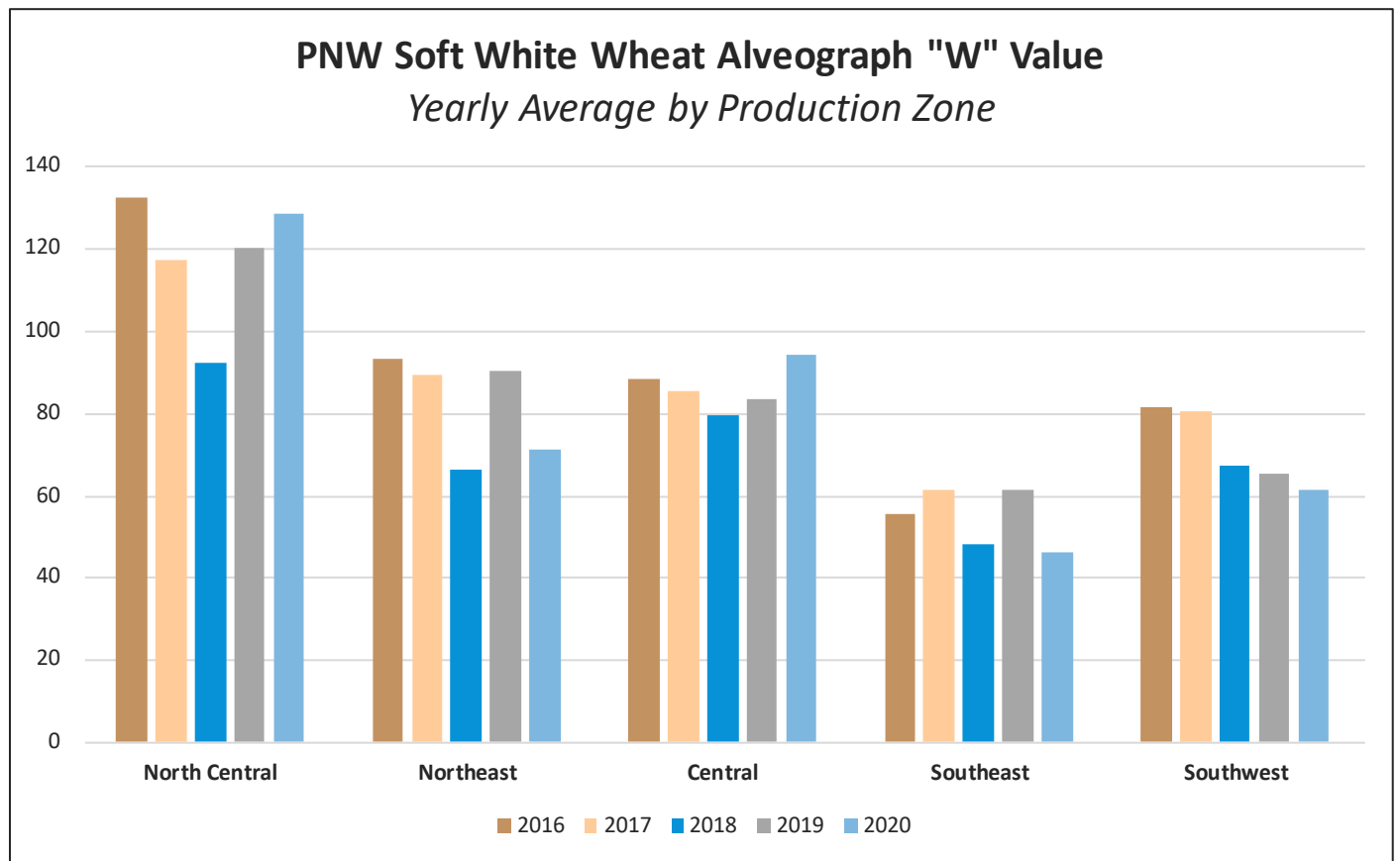
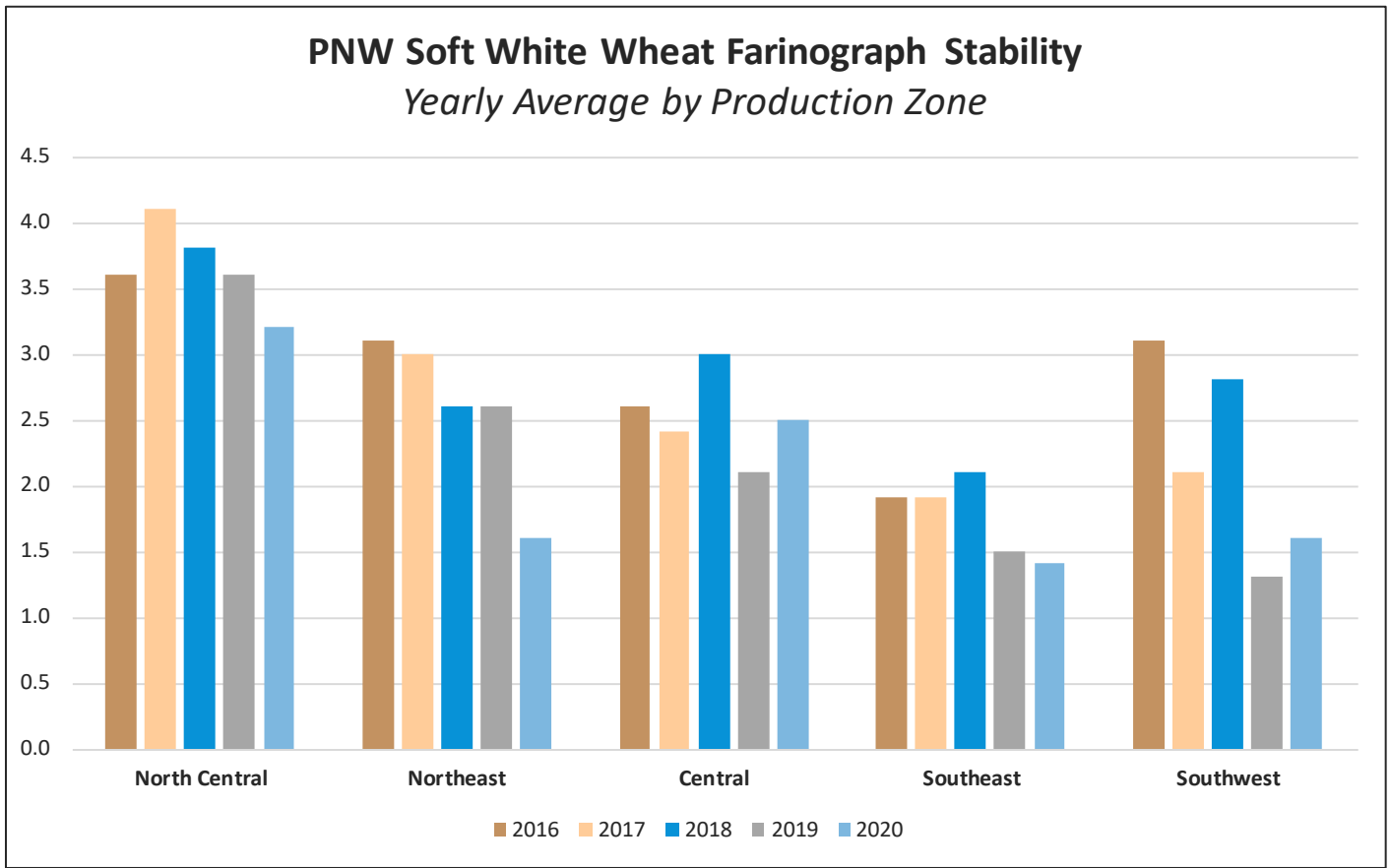
Production Zone	Wheat Protein Range 12% mb %	Water 14% mb %	50% Sucrose 14% mb %	5% Lactic Acid 14% mb %	5% Sodium Carbonate 14% mb %	Gluten Performance Index
North Central	<8.5	56	94	105	77	0.62
	8.5-9.4	55	97	116	78	0.66
	9.5-10.4	56	99	128	78	0.72
	10.5-12.0	54	102	120	76	0.67
	>12.0	50	101	138	75	0.78
	2020 Average	55	99	122	77	0.69
	2019 Average	54	93	120	71	0.74
	5 Year Average	57	92	117	82	0.68
Northeast	<8.5	54	97	97	79	0.55
	8.5-9.4	53	94	96	76	0.56
	9.5-10.4	50	91	102	74	0.62
	2020 Average	52	94	98	76	0.6
	2019 Average	53	89	115	72	0.71
	5 Year Average	56	86	107	83	0.64
Central	<8.5	58	97	106	75	0.62
	8.5-9.4	55	96	107	73	0.64
	9.5-10.4	55	97	113	76	0.65
	10.5-12.0	55	96	119	74	0.70
	>12.0	51	97	137	73	0.81
	2020 Average	55	96	114	74	0.67
	2019 Average	53	88	107	71	0.67
	5 Year Average	56	91	104	79	0.61
Southeast	8.5-9.4	52	87	78	72	0.49
	9.5-10.4	52	88	81	70	0.52
	10.5-12.0	50	88	76	70	0.48
	2020 Average	51	87	78	71	0.50
	2019 Average	53	90	97	68	0.62
	5 Year Average	55	91	87	76	0.52
Southwest	<8.5	55	96	97	81	0.55
	8.5-9.4	54	98	87	79	0.49
	9.5-10.4	52	96	96	78	0.55
	2020 Average	54	97	94	80	0.53
	2019 Average	53	90	97	68	0.62
	5 Year Average	58	94	104	85	0.58
White Club Wheat	2020 Average	54	96	79	74	0.47
	2019 Average	50	90	81	87	0.46
	5 Year Average	52	93	79	75	0.47



PHYSICAL DOUGH PROPERTIES

Production Zone	Wheat Protein Range	Farinograph			Alveograph			
	12% mb	Absorption 14% mb	Peak Time	Stability	P	L	P/L	W
	%	%	min	min	mm	mm		10 ⁻⁴ J
North Central	<8.5	49.8	1.4	1.7	36	119	0.30	98
	8.5-9.4	51.4	2.3	3.7	42	125	0.34	124
	9.5-10.4	52.5	3.0	3.2	41	134	0.31	124
	10.5-12.0	53.1	2.8	3.0	40	162	0.25	136
	>12.0	54.0	3.5	3.8	42	189	0.22	169
	2020 Average	52.3	2.7	3.2	41	142	0.29	128
	2019 Average	52.4	1.9	3.6	37	130	0.30	120
	5 Year Average	52.9	2.7	4.0	44	110	0.45	126
Northeast	<8.5	51.9	1.2	0.6	39	67	0.58	68
	8.5-9.4	52.6	1.3	1.3	38	75	0.51	72
	9.5-10.4	51.9	1.4	2.5	33	92	0.36	71
	2020 Average	52.2	1.3	1.6	36	80	0.47	71
	2019 Average	52.2	1.7	2.6	34	123	0.30	90
	5 Year Average	52.5	2.2	3.0	36	99	0.38	90
Central	<8.5	51.1	1.0	1.0	36	80	0.45	78
	8.5-9.4	50.5	1.4	1.7	31	99	0.31	78
	9.5-10.4	51.4	1.4	2.7	32	123	0.26	92
	10.5-12.0	52.1	2.2	3.4	32	157	0.20	102
	>12.0	53.0	3.9	4.2	36	183	0.20	151
	2020 Average	51.4	1.7	2.5	32	123	0.28	94
	2019 Average	51.2	1.6	2.1	29	126	0.24	83
Southeast	8.5-9.4	50.6	1.2	1.2	24	102	0.24	42
	9.5-10.4	51.8	1.4	1.7	27	111	0.24	53
	10.5-12.0	51.7	1.7	1.4	24	118	0.20	43
	2020 Average	51.4	1.5	1.4	25	111	0.23	46
	2019 Average	50.4	1.3	1.3	26	115	0.23	65
Southwest	8.5-9.4	51.7	1.2	1.4	34	85	0.40	60
	9.5-10.4	51.8	1.7	2.2	30	122	0.25	64
	2020 Average	51.0	1.4	1.6	32	94	0.36	61
	2019 Average	50.4	1.3	1.3	26	115	0.23	65
	5 Year Average	52.1	1.7	2.9	40	79	0.53	83
White Club Wheat	2020 Average	49.2	1.3	1.1	21	101	0.21	37
	2019 Average	50.2	1.2	1.5	18	102	0.18	35
	5 Year Average	51.3	1.6	1.4	25	75	0.37	43

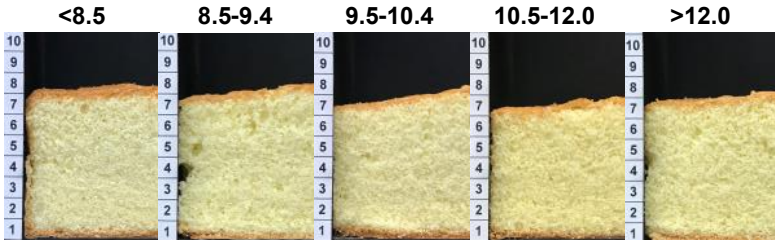
PHYSICAL DOUGH PROPERTIES



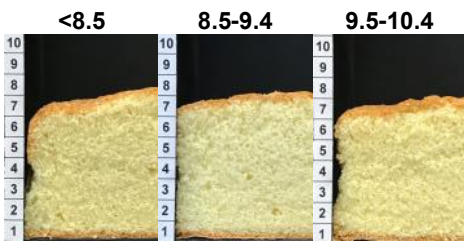


FINISHED PRODUCTS: SPONGE CAKE

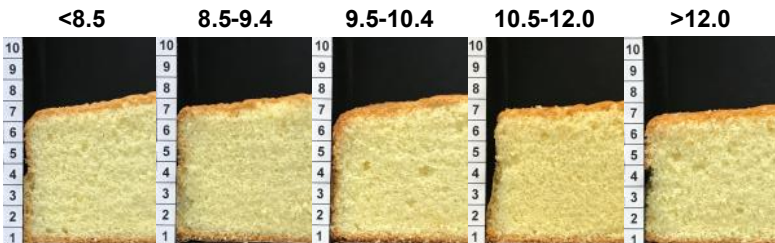
Production Zone	Wheat Protein Range	Sponge Cake	
	12% mb %	Volume cc	Total Score (Control is 56)



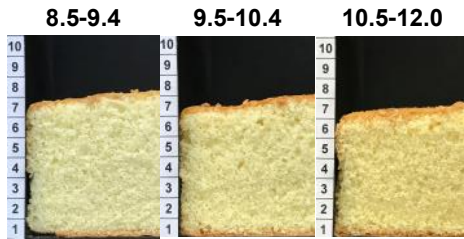
Production Zone	Wheat Protein Range	Volume cc	Total Score (Control is 56)
North Central	<8.5	1139	56
	8.5-9.4	1142	52
	9.5-10.4	1095	40
	10.5-12.0	1063	39
	>12.0	1117	45
	2020 Average	1101	44
2019 Average		1102	39
5 Year Average		1154	44



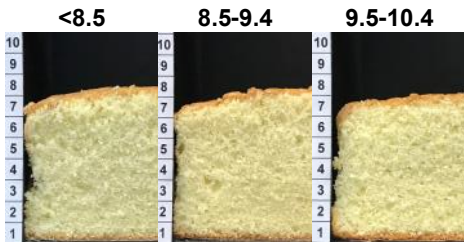
Production Zone	Wheat Protein Range	Volume cc	Total Score (Control is 56)	
Northeast	<8.5	1134	48	
	8.5-9.4	1129	53	
	9.5-10.4	1100	49	
	2020 Average	1119	51	
	2019 Average		1101	41
	5 Year Average		1169	46



Production Zone	Wheat Protein Range	Volume cc	Total Score (Control is 56)
Central	<8.5	1147	55
	8.5-9.4	1139	55
	9.5-10.4	1131	51
	10.5-12.0	1081	46
	>12.0	1085	39
	2020 Average	1122	51
2019 Average		1114	43
5 Year Average		1168	47



Production Zone	Wheat Protein Range	Volume cc	Total Score (Control is 56)
Southeast	8.5-9.4	1194	56
	9.5-10.4	1101	48
	10.5-12.0	1061	42
	2020 Average	1112	48
	2019 Average		1161
5 Year Average		1182	52



Production Zone	Wheat Protein Range	Volume cc	Total Score (Control is 56)
Southwest	<8.5	1170	54
	8.5-9.4	1130	52
	9.5-10.4	1104	50
	2020 Average	1136	52
	2019 Average		1161
5 Year Average		1198	51



Production Zone	Wheat Protein Range	Volume cc	Total Score (Control is 56)	
White Club Wheat	2020 Average	1129	47	
	2019 Average		1141	53
	5 Year Average		1186	49



FINISHED PRODUCTS: SUGAR SNAP COOKIE

Production Zone	Wheat Protein Range	Sugar Snap Cookie		
	12% mb %	Spread cm	Spread Factor width/height	Top Grain Score



Production Zone	Wheat Protein Range	Spread cm	Spread Factor width/height	Top Grain Score
North Central	<8.5	8.7	10.3	4.5
	8.5-9.4	8.9	11.1	4.0
	9.5-10.4	8.5	9.7	4.5
	10.5-12.0	8.6	9.6	4.0
	>12.0	8.7	10.2	3.5
	2020 Average	8.6	10.1	4.2
	2019 Average	8.7	10.3	4.7
	5 Year Average	8.8	9.6	3.5



Production Zone	Wheat Protein Range	Spread cm	Spread Factor width/height	Top Grain Score	
Northeast	<8.5	8.7	10.2	3.0	
	8.5-9.4	8.6	9.5	4.5	
	9.5-10.4	8.7	9.6	4.0	
	2020 Average	8.6	9.7	4.0	
		2019 Average	8.8	9.7	4.7
		5 Year Average	8.8	9.5	3.6



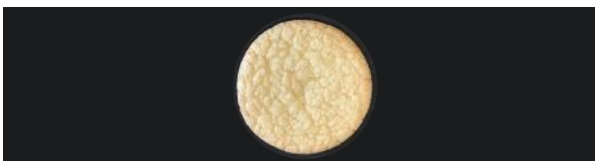
Production Zone	Wheat Protein Range	Spread cm	Spread Factor width/height	Top Grain Score
Central	<8.5	8.8	9.7	6.0
	8.5-9.4	8.7	9.6	4.0
	9.5-10.4	8.7	9.6	6.0
	10.5-12.0	8.5	8.9	4.0
	>12.0	8.5	9.1	4.0
	2020 Average	8.6	9.5	4.9
	2019 Average	8.9	10.9	4.0
	5 Year Average	8.7	9.7	3.7



Production Zone	Wheat Protein Range	Spread cm	Spread Factor width/height	Top Grain Score
Southeast	8.5-9.4	8.9	10.5	3.5
	9.5-10.4	8.8	10.0	5.0
	10.5-12.0	8.8	10.1	4.5
	2020 Average	8.8	10.2	4.4
		2019 Average	9.0	10.6
	5 Year Average	8.9	9.8	3.9



Production Zone	Wheat Protein Range	Spread cm	Spread Factor width/height	Top Grain Score	
Southwest	<8.5	8.8	9.5	4.5	
	8.5-9.4	8.5	8.9	3.5	
	9.5-10.4	8.6	8.6	4.0	
	2020 Average	8.6	9.0	4.0	
		2019 Average	9.0	10.6	5.3
		5 Year Average	8.7	9.1	3.9

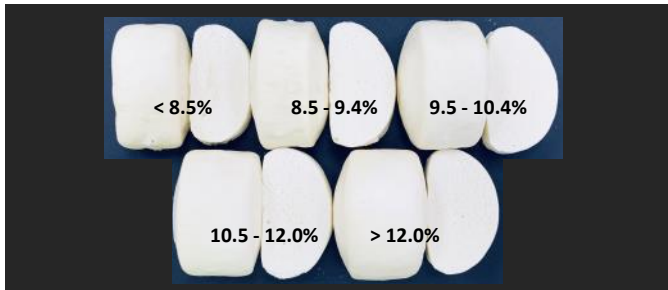


Production Zone	Wheat Protein Range	Spread cm	Spread Factor width/height	Top Grain Score	
White Club Wheat	2020 Average	9.2	11.5	5.5	
		2019 Average	9.0	12.0	5.5
		5 Year Average	9.1	11.1	4.9

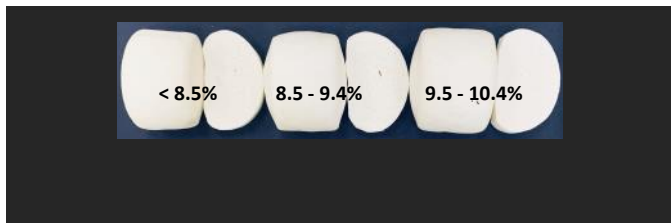


FINISHED PRODUCTS: STEAMED BREAD

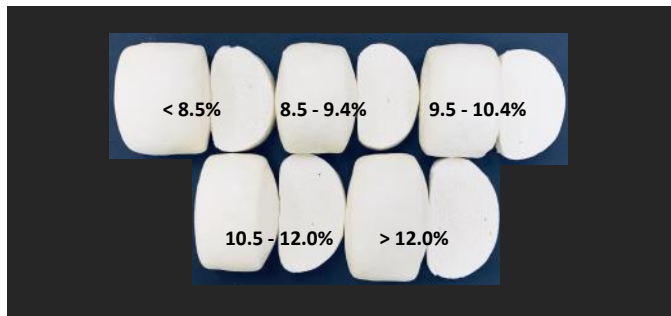
Production Zone	Wheat Protein Range	Chinese Southern Type Steamed Bread	
	12% mb %	Specific Volume cc/g	Total Score (Control is 70)



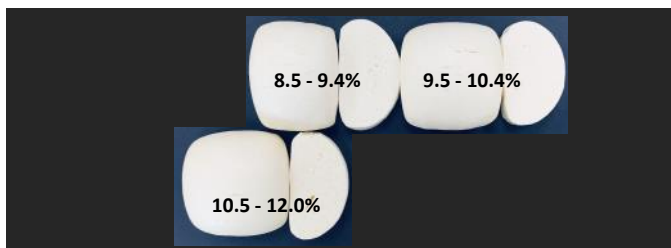
Production Zone	Wheat Protein Range	Specific Volume cc/g	Total Score (Control is 70)
North Central	<8.5	1.39	68
	8.5-9.4	1.51	69
	9.5-10.4	1.75	70
	10.5-12.0	1.83	71
	>12.0	1.96	72
	2020 Average	1.70	70
	2019 Average	1.94	69
	5 Year Average	2.03	68



Production Zone	Wheat Protein Range	Specific Volume cc/g	Total Score (Control is 70)
Northeast	<8.5	1.75	69
	8.5-9.4	1.83	68
	9.5-10.4	1.86	69
	2020 Average	1.83	69
	2019 Average	1.94	68
	5 Year Average	2.07	67



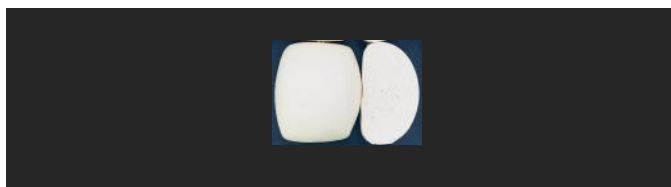
Production Zone	Wheat Protein Range	Specific Volume cc/g	Total Score (Control is 70)
Central	<8.5	1.84	68
	8.5-9.4	1.78	69
	9.5-10.4	1.66	68
	10.5-12.0	1.98	71
	>12.0	2.12	73
	2020 Average	1.80	69
	2019 Average	2.06	68
	5 Year Average	2.13	67



Production Zone	Wheat Protein Range	Specific Volume cc/g	Total Score (Control is 70)
Southeast	8.5-9.4	1.89	69
	9.5-10.4	1.98	68
	10.5-12.0	2.08	65
	2020 Average	1.99	67
	2019 Average	1.89	66
	5 Year Average	2.03	66

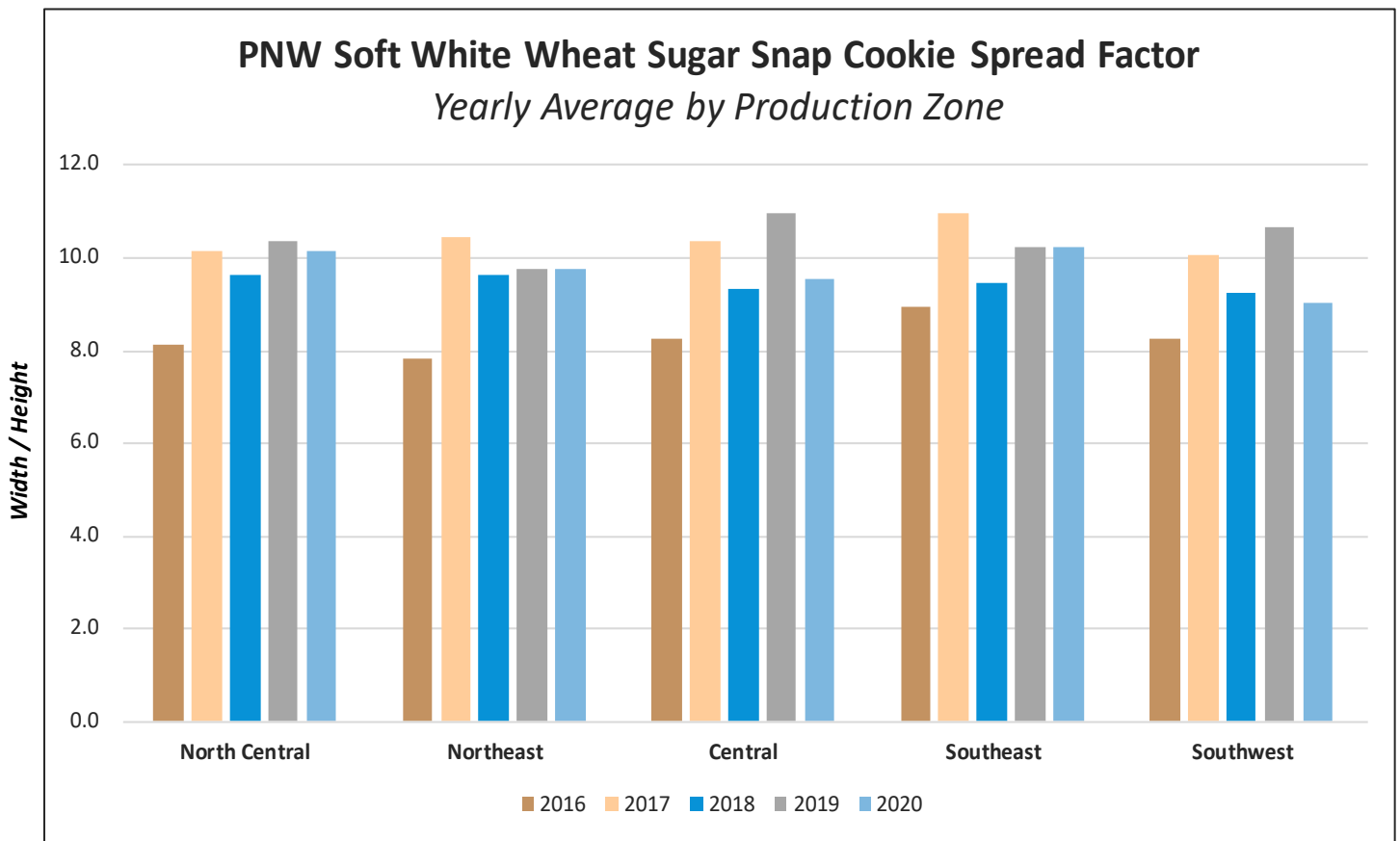
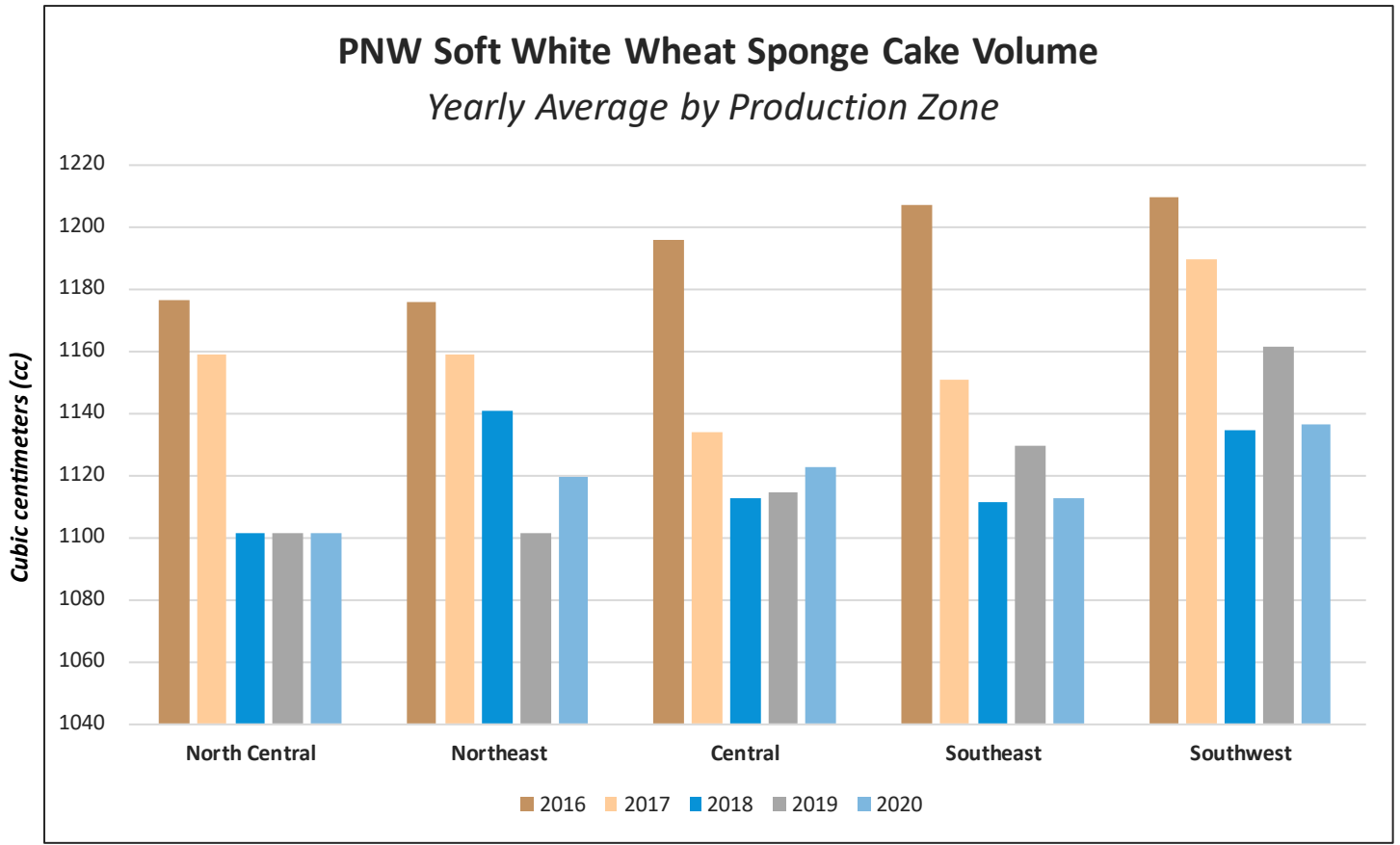


Production Zone	Wheat Protein Range	Specific Volume cc/g	Total Score (Control is 70)
Southwest	<8.5	1.59	67
	8.5-9.4	1.74	66
	9.5-10.4	1.92	67
	2020 Average	1.74	67
	2019 Average	1.89	66
	5 Year Average	2.04	66



Production Zone	Wheat Protein Range	Specific Volume cc/g	Total Score (Control is 70)
White Club Wheat	2020 Average	2.05	66
	2019 Average	2.14	62
	5 Year Average	2.19	64

FINISHED PRODUCTS



SUMMARY

These results were derived from composite samples from the 2020 Pacific Northwest soft white (SW) and white club (WC) wheat harvest. SW composites were prepared by production zone and protein levels. All WC samples were blended into one composite. The composite samples were analyzed for wheat quality, flour quality, solvent retention capacity, physical dough properties, and finished product characteristics. Please note that some production zones did not have low or high protein samples this year. Harvest results are summarized as follows:

Wheat Quality

Test Weight

- ◆ SW test weights are ≥ 61.4 pounds per bushel (lbs/bu) at all protein levels in all areas except for the Southwest production zone.
- ◆ WC test weight is 61.6 lbs/bu.

Wheat Moisture

- ◆ SW wheat moistures are generally below 10% except for the Southwest zone, which has an average wheat moisture of 10.6%.
- ◆ WC wheat moisture is 8.5%.

Falling Number

- ◆ SW falling number values are ≥ 318 sec in all production zones.
- ◆ WC falling number is 322 sec.

Wheat Ash

- ◆ SW wheat ash averages are between 1.26% to 1.55% (14% mb).
- ◆ WC wheat ash average is 1.27% (14% mb).

Thousand Kernal Weight (TKW)

- ◆ SW TKW ranges from 35.3 g to 38.6 g across the production zones.
- ◆ WC TKW is 32.3 g.

SKCS Kernal Hardness Index

- ◆ SW SKCS hardness averages range from 32 to 34 except for the Southwest production zone, which has an average hardness of 28.
- ◆ WC SKCS hardness average is 31.

Whole Meal Wet Gluten

- ◆ SW average whole meal wet gluten is 20.1% to 25.0%, with the lower values coming from the Southwest and Northeast zones.
- ◆ WC whole meal wet gluten is 18.0%.

Flour Quality

Flour Yields

- ◆ SW flour yields exceeded 70% for all protein composites in all production zones, with the exception of the composite with $>12\%$ protein from the Central zone. Average flour yields range from 72.0% to 74.4%.
- ◆ WC flour yield is 74.7%.

Flour Ash

- ◆ SW straight grade flour ash values are 0.50% (14% mb) or lower across all production zones.
- ◆ WC straight grade flour ash is 0.48% (14% mb).

Flour Color

- ◆ SW flour L* (whiteness) values exceed 92.0 across all protein composites and production zones. Average values range from 92.3 to 92.8.
- ◆ WC flour L* is 92.6.

Wet Gluten

- ◆ SW wet gluten ranges from 14.8% to 36.4% with weighted averages of $\geq 18.1\%$ across all production zones. These values are typical for samples with very weak to medium gluten strength.
- ◆ WC wet gluten is 13.1%, indicating very weak gluten strength.

Flour Falling Number

- ◆ SW flour falling number weighted average values are all ≥ 316 sec.
- ◆ WC flour falling number is 365 sec.

Amylograph

- ◆ SW Amylograph peak viscosity averages are all ≥ 432 BU except for the Southwest production zone, which had a peak viscosity average of 296 BU.
- ◆ WC Amylograph peak viscosity is 439.

Solvent Retention Capacity (SRC)

Water SRC

- ◆ SW water SRC values are ≤ 55% for most protein composites across all production zones. Lower protein composites had greater values.
- ◆ WC water SRC is 54%.

Sucrose SRC

- ◆ SW sucrose SRC values are ≤ 99% for most protein composites, with the exception of the 10.5% - 12.0% and > 12% protein composites in the North Central zone.
- ◆ WC sucrose SRC is 96%.

Lactic Acid SRC

- ◆ SW lactic acid SRC averages are 98% or less across most production zones except for the North Central and Central zones, which have average values of 122% and 114%, respectively. These values are typical for weak to medium gluten strength.
- ◆ WC lactic acid SRC is 79%, indicative of very weak gluten.

Sodium Carbonate SRC

- ◆ SW sodium carbonate SRC values are ≤ 81% for all protein composites in all production zones.
- ◆ WC sodium carbonate SRC is 74%.

Gluten Performance Index (GPI)

- ◆ SW GPI averages are 0.60 or less across most production zones except for the North Central and Central zones, which have averages of 0.69 and 0.67, respectively. This is in line with the lactic acid SRC results and indicates that gluten strength is weak to medium.
- ◆ WC GPI is 0.47, which is typical for very weak gluten.

Physical Dough Properties

Farinograph

- ◆ SW Farinograph water absorption values are 54.0% or lower for all protein composites across all production zones with average peak times and stabilities of ≤ 3.5 min and ≤ 3.8 min, respectively. Peak times and stabilities were longer for higher protein composites. Low water absorption values are desirable for products like cookies and crackers.
- ◆ WC Farinograph water absorption is 49.2% with a peak time of 1.3 min and a stability of 1.1 min.

Alveograph

- ◆ SW Alveograph P value averages range from 25 mm to 41 mm with L value averages of 80 mm to 142 mm and P/L averages of 0.23 to 0.47. W value averages are 46 (10-4 J) in the Southeast zone and 128 (10-4 J) in the North Central zone. The values align with Farinograph data for gluten strength ranging from weak to medium.
- ◆ WC Alveograph P, L, P/L and W values are 21 mm, 101 mm, 0.21 and 37 (10-4 J), respectively. These values are typical for very weak gluten strength.

Finished Products

Sponge Cake

SW sponge cake volume averages are over 1100 cc in all production zones with total scores ≥ 48 except for the North Central zone, which has a total score of 44. Protein composites ≤ 10.5% show better cake volumes and total scores. Scores of 50 or higher from Buhler laboratory mill straight grade flours are acceptable relative to the Japanese commercial control (low ash patent cake flour) score of 56.

WC sponge cake volume is 1129 cc with a total score of 47. The slightly firmer texture of WC relative to the control resulted in the total score dropping below 50.

Sugar Snap Cookies

SW cookie diameters average 8.6 cm in most production zones, with the exception of 8.8 cm in the Southeast zone, with spread factors of 9.0 to 10.2 and top grain scores of 4.0 to 4.9. All composites show acceptable cookie quality.

WC has an average cookie diameter of 9.2 cm with a spread factor of 11.5 and a top grain score of 5.5. These values are indicative of good cookie quality.

Steamed Bread

SW steamed bread specific volume averages are 1.70 g/cc or greater in all production zones with total scores ranging from 67 to 70. Higher protein composites (≥ 9.5 – 10.4% protein) give better specific volumes and total scores. Scores of 70 or higher are equal to or better than the control flour.

WC steamed bread specific volume is 2.05 g/cc with a total score of 66.

In summary, the overall quality of the crop can be described as very good, characterized by medium to very weak gluten strength with excellent potential to produce soft wheat flour products and other products made from blends of soft and hard wheat.

Note: The data in this report are accurate for samples received through September 14, 2020.

*Photo by Kathy McCullough courtesy
of the Oregon Wheat Commission*



Wheat Marketing Center thanks the many individuals and organizations that provided samples for the 2020 Annual Pacific Northwest Crop Quality Survey, and recognizes with gratitude the project's funding partners:



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