

2005 Harvest

U.S. PACIFIC NORTHWEST --- *Soft White Wheat Quality Report*



*This project is funded by the wheat commissions of Idaho, Oregon, and Washington,
Wheat Marketing Center, Inc., and U.S. Wheat Associates*

THE PACIFIC NORTHWEST

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



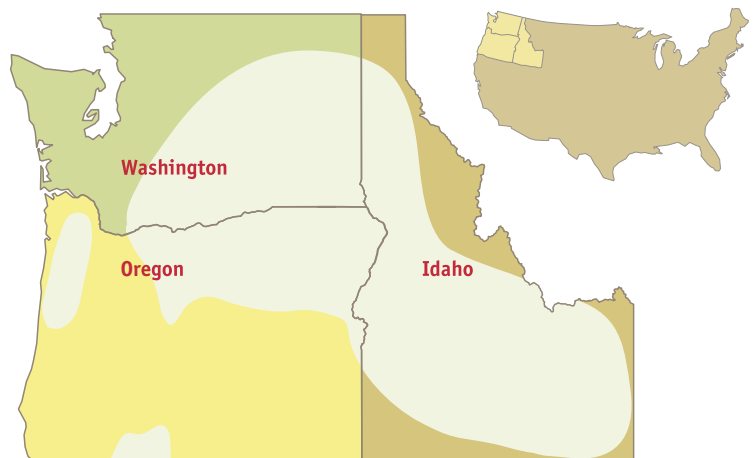
Pacific Northwest soft white wheat is known for its white bran, low moisture content, and weak dough strength characteristics. Soft white wheat is well suited for products such as cakes, pastries, cookies, crackers, pancakes, sponge cakes, snack foods, and flat breads.

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

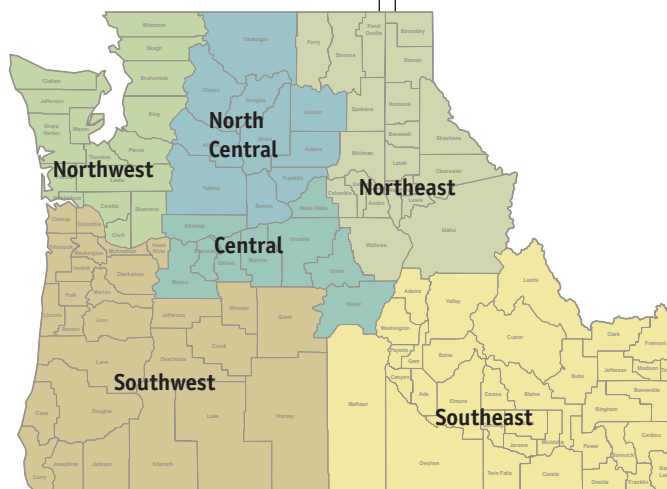
is a blend of the white club wheat subclass and soft white wheat. The amount of white club wheat in western white wheat ranges from 10-90%. The minimum percentage of

white club wheat in western white wheat is 10% and any higher amounts are contract specifications that are negotiated between the buyer and seller.

WHEAT GROWING AREAS OF THE PACIFIC NORTHWEST



WHEAT PRODUCTION ZONES



Wheat Samples

At harvest, National Agricultural Statistics Service collected 414 soft white wheat and 49 white club wheat samples this year, based on wheat production. Federal Grain Inspection Service (FGIS) graded each wheat sample. Wheat Marketing Center

conducted wheat, flour, and finished product tests on composites based on production zones and protein levels.

Weather

The Pacific Northwest had favorable conditions at planting. Most growers experienced dry conditions

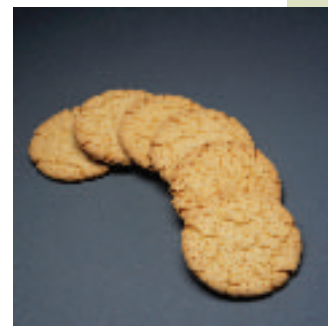
during the winter. Timely rain in dry land farming areas in Idaho, Oregon, and Washington contributed to a crop with good yields. Hot and dry conditions prevailed during most of the wheat harvest in Pacific Northwest.

2005 Soft White and White Club Wheat Production

By production zone

Wheat production estimates courtesy of Washington Wheat Commission

Production Zone	Million Metric Tons	Million Bushels
North Central	1.85	68.1
Northeast	2.19	80.5
Central	1.52	55.7
Southeast	0.88	32.3
Northwest	.02	0.7
Southwest	0.19	7.0
Total	6.65	244.3

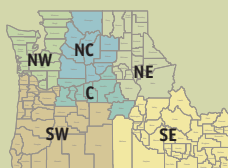


WHEAT QUALITY

Production Zone	Wheat Protein Range 12% mb %	Grade	Test Weight lb/bu	Dockage %	Whole Kernel Moisture %	Falling Number 14% mb seconds	Ash 14% mb %	Thousand Kernel Weight 14% mb g	SKCS Kernel Hardness Index	Whole Meal Wet Gluten 14% mb %
North Central	<8.5	1 SWH	61.1	0.1	8.6	339	1.23	33.7	30	17.5
	8.5-9.4	1 SWH	61.0	0.2	9.0	319	1.26	36.3	28	21.3
	9.5-10.4	1 SWH	60.3	0.3	8.7	361	1.31	31.7	31	24.8
	10.5-12.0	1 SWH	60.7	0.2	8.8	370	1.28	33.3	27	29.4
	>12.0	1 SWH	60.4	0.1	8.9	391	1.23	31.0	27	33.4
	2005 Average	1 SWH	60.3	0.4	8.5	352	1.28	31.7	31	24.3
	2004 Average	1 SWH	60.6	0.3	9.2	377	1.24	36.0	29	—
	3 Year Average	1 SWH	60.4	0.4	8.8	363	1.27	32.8	29	—
Northeast	<8.5	1 SWH	61.3	0.3	9.2	367	1.41	36.0	39	16.9
	8.5-9.4	1 SWH	61.2	0.4	8.8	355	1.42	32.3	40	22.7
	9.5-10.4	1 SWH	60.9	0.5	9.0	390	1.43	34.3	36	25.3
	10.5-12.0	2 SWH	59.2	0.5	8.7	394	1.46	29.3	37	29.2
	>12.0	2 SWH	59.2	0.4	8.4	412	1.44	28.3	35	33.5
	2005 Average	1 SWH	60.4	0.5	8.8	367	1.44	32.7	39	22.2
	2004 Average	1 SWH	60.1	0.5	9.4	384	1.36	34.6	32	—
	3 Year Average	1 SWH	60.0	0.5	9.1	374	1.39	32.4	33	—
Central	<8.5	1 SWH	60.2	0.2	8.7	324	1.35	38.7	34	16.5
	8.5-9.4	1 SWH	60.6	0.3	9.0	380	1.30	36.0	37	21.7
	9.5-10.4	1 SWH	60.6	0.2	8.8	387	1.28	37.7	35	24.2
	10.5-12.0	2 SWH	59.9	0.3	8.8	408	1.32	36.3	36	27.0
	>12.0	2 SWH	58.1	0.6	8.6	417	1.46	31.0	32	34.5
	2005 Average	2 SWH	59.5	0.7	8.5	347	1.36	33.7	37	22.9
	2004 Average	1 SWH	60.5	0.5	9.2	377	1.32	40.4	29	—
	3 Year Average	2 SWH	59.4	0.7	8.6	368	1.36	34.1	33	—
Southeast	<8.5	1 SWH	61.5	0.6	9.7	315	1.51	35.0	27	19.1
	8.5-9.4	1 SWH	61.2	0.1	9.8	352	1.48	42.7	28	21.0
	9.5-10.4	1 SWH	60.9	0.4	9.3	372	1.55	35.3	31	23.9
	10.5-12.0	1 SWH	60.6	0.4	9.5	380	1.60	35.7	29	26.9
	>12.0	2 SWH	58.0	0.3	8.7	376	1.80	32.0	29	31.6
	2005 Average	1 SWH	60.5	1.0	9.4	337	1.58	36.2	31	22.2
	2004 Average	1 SWH	60.6	1.1	9.4	368	1.51	40.3	28	—
	3 Year Average	1 SWH	60.1	1.1	9.2	356	1.57	36.6	27	—
Northwest	2005 Average	No wheat samples received from this production zone.								
	2004 Average	1 SWH	61.3	0.1	12.9	301	1.34	46.5	30	—
Southwest	2005 Average	Insufficient number of samples received from this production zone.								
	2004 Average	1 SWH	60.5	0.6	10.5	354	1.45	40.7	33	—
White Club Wheat	2005 Average	1 WHCB	60.4	0.9	8.2	333	1.32	30.5	38	15.8
	2004 Average	1 WHCB	60.3	0.8	8.9	346	1.24	31.9	36	—
	3 Year Average	1 WHCB	60.3	0.8	8.4	347	1.28	30.5	37	—

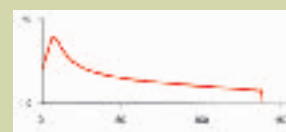
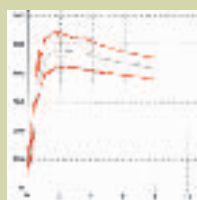
FLOUR QUALITY

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 seconds	Amylograph Peak Viscosity BU
					L*	a*	b*			
North Central	<8.5	65.4	0.32	6.9	92.8	-2.7	8.3	14.9	361	585
	8.5-9.4	65.0	0.32	7.7	92.7	-2.6	7.7	17.5	330	670
	9.5-10.4	67.6	0.36	8.6	92.5	-2.5	8.0	22.4	379	620
	10.5-12.0	66.6	0.36	9.7	92.5	-2.5	7.7	23.3	413	680
	>12.0	63.2	0.34	10.5	92.6	-2.4	7.5	25.7	415	710
	2005 Average	65.7	0.34	8.6	92.6	-2.5	7.8	20.6	377	651
	2004 Average	67.8	0.38	8.8	92.5	-2.7	6.8	24.6	400	668
	3 Year Average	66.2	0.37	8.5	92.6	-2.6	7.2	22.5	383	664
Northeast	<8.5	68.0	0.37	6.7	92.5	-2.6	8.3	17.6	362	475
	8.5-9.4	68.6	0.39	7.3	92.4	-2.6	8.3	21.9	358	575
	9.5-10.4	69.3	0.39	8.4	92.4	-2.4	8.1	24.5	360	600
	10.5-12.0	66.8	0.43	9.4	92.4	-2.4	8.1	29.5	354	610
	>12.0	63.9	0.41	10.3	92.5	-2.3	7.4	31.2	435	665
	2005 Average	67.8	0.39	7.9	92.4	-2.5	8.2	23.1	366	562
	2004 Average	70.2	0.35	8.9	92.5	-2.7	7.1	25.0	368	459
	3 Year Average	68.8	0.38	8.4	92.4	-2.6	7.5	23.7	370	553
Central	<8.5	66.3	0.32	6.7	92.6	-2.6	8.6	15.7	321	220
	8.5-9.4	65.6	0.32	7.3	92.5	-2.6	8.8	23.6	350	540
	9.5-10.4	65.5	0.35	7.8	92.5	-2.5	8.4	24.0	385	520
	10.5-12.0	64.4	0.35	9.2	92.5	-2.5	8.5	28.6	429	580
	>12.0	61.4	0.41	11.3	92.3	-2.2	7.6	34.1	396	595
	2005 Average	64.8	0.34	8.3	92.5	-2.5	8.4	24.5	389	464
	2004 Average	68.8	0.39	9.0	92.4	-2.7	7.0	23.7	374	565
	3 Year Average	65.7	0.37	8.9	92.4	-2.6	7.4	25.0	391	576
Southeast	<8.5	66.5	0.39	6.7	92.7	-2.4	7.4	18.9	324	270
	8.5-9.4	68.2	0.41	7.5	92.6	-2.4	7.5	20.3	343	380
	9.5-10.4	68.1	0.43	8.2	92.5	-2.4	7.8	22.8	325	555
	10.5-12.0	65.6	0.44	9.3	92.3	-2.3	7.5	27.8	388	620
	>12.0	63.6	0.37	11.9	92.2	-2.2	7.4	31.8	360	450
	2005 Average	67.1	0.42	8.4	92.5	-2.4	7.6	23.6	348	503
	2004 Average	68.6	0.43	8.9	92.4	-2.7	6.8	20.3	362	481
	3 Year Average	67.6	0.43	8.6	92.5	-2.6	7.1	22.0	361	549
Northwest	2005 Average	No wheat samples received from this production zone.								
	2004 Average	67.2	0.41	7.2	92.4	-2.5	6.3	18.9	310	295
Southwest	2005 Average	Insufficient number of wheat samples received from this production zone.								
	2004 Average	69.2	0.40	8.5	92.5	-2.4	5.7	21.0	307	222
White Club Wheat	2005 Average	67.6	0.39	7.6	92.5	-2.5	7.0	20.7	356	530
	2004 Average	68.9	0.37	8.6	92.4	-2.6	6.7	18.0	353	545
	3 Year Average	68.0	0.39	8.1	92.6	-2.5	6.9	19.0	344	547



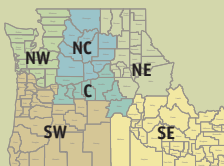
PHYSICAL DOUGH PROPERTIES

Production Zone	Wheat Protein Range 12% mb %	Farinograph			Alveograph		
		Absorption 14% mb %	Peak Time minutes	Stability minutes	P mm	L mm	W 10 ⁴ joules
North Central	<8.5	51.5	1.4	2.1	42	85	109
	8.5-9.4	51.7	1.3	3.8	43	91	125
	9.5-10.4	52.2	1.4	5.6	41	134	142
	10.5-12.0	53.0	2.8	6.8	42	154	162
	>12.0	53.4	4.1	8.4	43	168	196
	2005 Average	52.3	2.1	5.2	42	125	145
	2004 Average	49.7	1.5	3.3	41	130	143
	3 Year Average	50.6	1.7	3.9	42	123	139
Northeast	<8.5	53.6	1.3	1.6	42	73	86
	8.5-9.4	54.0	1.4	3.6	40	116	111
	9.5-10.4	54.1	1.3	3.9	38	140	118
	10.5-12.0	54.1	2.8	5.9	39	175	146
	>12.0	54.0	3.5	6.7	40	205	190
	2005 Average	53.9	1.8	3.7	40	124	117
	2004 Average	50.4	1.4	2.6	38	120	109
	3 Year Average	51.6	1.6	3.0	41	116	115
Central	<8.5	51.5	1.2	1.5	30	80	62
	8.5-9.4	51.7	1.5	2.9	35	68	70
	9.5-10.4	53.0	1.4	3.7	40	112	105
	10.5-12.0	52.3	1.4	4.1	40	130	117
	>12.0	54.3	2.7	5.1	40	175	160
	2005 Average	52.5	1.6	3.3	36	110	99
	2004 Average	50.2	1.4	2.0	35	127	100
	3 Year Average	51.0	1.6	2.8	37	128	112
Southeast	<8.5	52.3	1.2	1.2	31	77	58
	8.5-9.4	53.2	1.2	2.1	32	104	69
	9.5-10.4	53.1	1.8	3.6	30	124	73
	10.5-12.0	53.4	1.9	4.1	25	129	69
	>12.0	53.1	2.6	6.0	41	138	122
	2005 Average	53.1	1.7	3.2	29	117	71
	2004 Average	50.5	1.3	1.9	30	112	69
	3 Year Average	51.4	1.4	2.4	32	113	74
Northwest	2005 Average	No wheat samples received from this production zone.					
	2004 Average	51.0	0.7	1.5	39	87	90
Southwest	2005 Average	Insufficient number of wheat samples received from this production zone.					
	2004 Average	51.6	1.2	2.0	45	106	112
White Club Wheat	2005 Average	51.5	1.2	1.9	24	93	47
	2004 Average	49.1	1.0	0.9	23	86	40
	3 Year Average	50.1	1.2	1.4	27	81	47



FINISHED PRODUCTS

Production Zone	Wheat Protein Range 12% mb %	Sugar Snap Cookie		Sponge Cake		Chinese Southern Type Steamed Bread	
		Spread cm	Top Grain Score control=5	Total Score control=56	Volume cc	Total Score control=70	Specific Volume cc/g
North Central	<8.5	8.6	3.0	44	1,200	67	2.58
	8.5-9.4	8.5	2.5	47	1,185	68	2.60
	9.5-10.4	8.2	1.0	51	1,194	68	2.62
	10.5-12.0	8.1	0.5	47	1,131	68	2.86
	>12.0	8.0	0.0	49	1,242	67	2.97
	2005 Average	8.3	1.5	48	1,190	68	2.71
	2004 Average	8.4	2.9	48	1,271	68	2.59
	3 Year Average	8.3	2.8	48	1,214	—	—
Northeast	<8.5	8.5	5.0	53	1,194	67	2.46
	8.5-9.4	8.0	2.5	54	1,175	68	2.51
	9.5-10.4	8.1	1.5	54	1,175	67	2.84
	10.5-12.0	8.0	0.0	54	1,208	69	2.81
	>12.0	8.1	0.0	47	1,174	69	2.91
	2005 Average	8.2	2.5	53	1,186	68	2.64
	2004 Average	8.3	2.3	45	1,189	68	2.73
	3 Year Average	8.2	3.1	49	1,185	—	—
Central	<8.5	8.4	3.0	51	1,189	69	2.50
	8.5-9.4	7.8	1.0	51	1,234	69	2.51
	9.5-10.4	7.9	0.5	51	1,176	65	2.54
	10.5-12.0	7.7	0.0	47	1,140	66	2.63
	>12.0	7.9	0.0	46	1,165	67	2.86
	2005 Average	8.0	1.1	49	1,182	67	2.60
	2004 Average	8.3	2.4	46	1,205	67	2.65
	3 Year Average	8.1	1.6	49	1,182	—	—
Southeast	<8.5	8.8	6.0	51	1,180	66	2.44
	8.5-9.4	8.4	3.0	51	1,148	65	2.53
	9.5-10.4	8.3	2.5	53	1,213	65	2.65
	10.5-12.0	8.4	1.0	54	1,195	67	2.74
	>12.0	7.8	0.0	49	1,148	70	2.83
	2005 Average	8.4	2.5	53	1,189	65	2.63
	2004 Average	8.5	3.4	49	1,229	66	2.57
	3 Year Average	8.4	3.0	49	1,194	—	—
Northwest	2005 Average	No wheat samples received from this production zone.					
	2004 Average	8.5	4.0	48	1,236	67	2.35
Southwest	2005 Average	Insufficient number of wheat samples received from this production zone.					
	2004 Average	8.1	2.1	47	1,193	68	2.48
White Club Wheat	2005 Average	8.7	5.0	46	1,164	62	2.57
	2004 Average	8.8	4.0	49	1,267	68	2.93
	3 Year Average	8.6	3.6	47	1,188	63	2.80



SUMMARY

These results are from composite samples of the Pacific Northwest soft white wheat and white club wheat harvest. Composite samples were prepared by production zone at protein levels. These composite samples were analyzed for wheat and flour quality, physical dough properties, and finished product characteristics for the 2004 and 2005 harvests and three-year averages.

Information on the 2005 harvest is summarized below.

Wheat Quality

Wheat data indicated good test weights at most protein levels in all of the production zones. The Southeast Production Zone indicated generally higher dockage levels than the other production zones. Generally, low moisture wheat less than 10% prevailed in the major wheat producing zones of North Central, Northeast,



Central, and Southeast. Low wheat ash contents were present in the North Central Production Zone. Wheat samples from the Southeast Production Zone had high thousand kernel weights.

Flour Quality

Flour quality parameters indicated higher wet gluten contents in wheat samples with higher protein levels. Average falling number values in the North Central, Northeast, Central, and Southeast

Production Zones were greater than 300 seconds at all protein ranges. Amylograph peak viscosities above 500 BU were present in all protein ranges in samples from North Central Production Zone.

Physical Dough Properties

Physical dough property tests indicated generally lower water absorption and weaker gluten strength, as measured by the farinograph, in samples with lower protein content. Longer gluten extensibility,

as shown by alveograph L values, was observed in samples with higher protein content. White club wheat had generally weaker gluten strength than soft white wheat.

Finished Products

Finished product tests indicated that very good sugar snap cookies were made using low protein samples from the North Central, Northeast, Central, and Southeast Production Zones. Average sponge cake scores and volumes were higher in samples from the North Central and Southeast Production Zones. Steamed bread specific volumes generally increased with increasing protein content.

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