

# 2007 Harvest

## U.S. PACIFIC NORTHWEST

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### *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.**



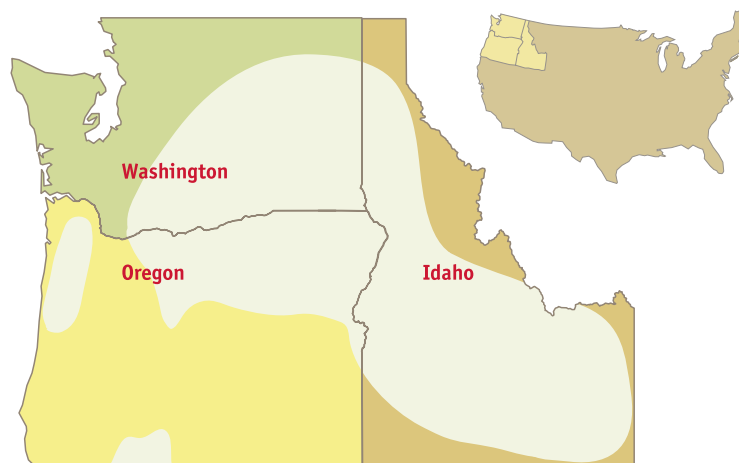
**P**acific Northwest soft white wheat is known for its white bran, low moisture content, and weak dough strength characteristics. Soft white wheat is well suited for products such as cakes, pastries, cookies, crackers, pancakes, sponge cakes, snack foods, and flat breads.

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 293 soft white wheat and 51 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.

The major soft white wheat varieties were Eltan, Madsen, Stephens, and Tubbs.

## Weather

The Pacific Northwest had dry conditions at planting. Most of the wheat production area received adequate rainfall during winter and early spring. Dry conditions prevailed during the wheat harvest of the Pacific Northwest.



## 2007 Soft White and White Club Wheat Production

*By production zone*

*Wheat production estimates courtesy of Washington Wheat Commission*

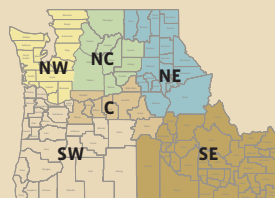
Production Zone	Million Metric Tons (MMT)	Million Bushels
North Central	1.35	49.5
Northeast	1.52	55.9
Central	1.27	46.9
Southeast	0.63	23.1
Southwest	0.06	2.3
Northwest	0.01	0.2
<b>Total</b>	<b>4.84</b>	<b>177.9</b>

# 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	2 SWH	59.1	0.6	9.5	305	1.23	32.0	24	14.0
	8.5-9.4	1 SWH	60.2	0.6	9.0	328	1.25	33.5	30	19.8
	9.5-10.4	1 SWH	61.0	0.4	8.9	337	1.23	35.8	32	23.6
	10.5-12.0	1 SWH	60.8	0.6	9.0	347	1.27	33.7	32	25.8
	>12.0	2 SWH	59.3	0.5	8.6	350	1.39	32.5	29	27.2
	<b>2007 Av.</b>	<b>1 SWH</b>	<b>60.1</b>	<b>0.6</b>	<b>9.1</b>	<b>330</b>	<b>1.25</b>	<b>33.5</b>	<b>29</b>	<b>20.7</b>
	2006 Av.	1 SWH	60.8	0.5	8.8	337	1.35	33.5	35	22.8
3 Year Av.	1 SWH	60.4	0.5	8.8	340	1.29	32.9	32	24.7	
Northeast	<8.5	1 SWH	60.6	0.3	9.4	340	1.31	38.8	43	15.8
	8.5-9.4	2 SWH	59.9	0.5	9.4	343	1.38	33.7	39	19.8
	9.5-10.4	1 SWH	60.5	0.6	8.8	346	1.36	33.2	41	23.5
	10.5-12.0	2 SWH	59.4	0.6	9.3	346	1.37	31.9	41	25.9
	>12.0	2 SWH	59.2	0.5	8.8	344	1.38	30.3	38	30.4
	<b>2007 Av.</b>	<b>2 SWH</b>	<b>59.7</b>	<b>0.5</b>	<b>9.0</b>	<b>345</b>	<b>1.37</b>	<b>32.2</b>	<b>40</b>	<b>25.6</b>
	2006 Av.	2 SWH	59.5	0.7	8.9	337	1.46	31.7	41	24.6
3 Year Av.	2 SWH	59.9	0.6	8.9	350	1.42	32.2	40	29.7	
Central	<8.5	1 SWH	60.5	0.6	9.7	319	1.32	39.0	39	15.9
	8.5-9.4	1 SWH	60.5	0.5	9.9	327	1.32	35.7	41	19.6
	9.5-10.4	1 SWH	60.1	0.7	9.7	337	1.33	36.2	37	22.9
	10.5-12.0	1 SWH	60.1	0.4	9.0	332	1.34	34.4	38	26.8
	>12.0	3 SWH	57.8	0.9	9.3	354	1.46	30.4	36	30.5
	<b>2007 Av.</b>	<b>2 SWH</b>	<b>59.9</b>	<b>0.6</b>	<b>9.5</b>	<b>326</b>	<b>1.35</b>	<b>38.3</b>	<b>38</b>	<b>22.5</b>
	2006 Av.	1 SWH	60.1	0.6	8.7	339	1.44	37.2	37	23.2
3 Year Av.	2 SWH	59.9	0.6	8.9	337	1.38	36.4	38	27.6	
Southeast	<8.5	2 SWH	59.9	0.7	9.1	315	1.51	40.1	25	14.7
	8.5-9.4	1 SWH	60.7	1.8	9.7	337	1.54	39.5	29	17.7
	9.5-10.4	2 SWH	59.6	0.9	9.3	316	1.62	42.1	24	21.3
	10.5-12.0	1 SWH	60.6	1.0	9.5	329	1.57	37.2	28	23.6
	>12.0	2 SWH	58.9	0.7	10.9	322	1.66	33.5	26	30.0
	<b>2007 Av.</b>	<b>1 SWH</b>	<b>60.3</b>	<b>1.1</b>	<b>9.5</b>	<b>326</b>	<b>1.57</b>	<b>38.7</b>	<b>27</b>	<b>21.0</b>
	2006 Av.	1 SWH	60.4	1.3	9.2	319	1.60	35.2	30	22.1
3 Year Av.	1 SWH	60.4	1.1	9.4	327	1.58	36.7	29	24.6	
White Club Wheat	<b>2007 Av.</b>	<b>1 WHCB</b>	<b>60.2</b>	<b>0.8</b>	<b>8.9</b>	<b>337</b>	<b>1.28</b>	<b>31.0</b>	<b>37</b>	<b>19.8</b>
	2006 Av.	1 WHCB	60.0	0.7	8.4	338	1.36	30.5	38	18.4
	3 Year Av.	1 WHCB	60.2	0.8	8.5	336	1.32	30.7	38	18.0
Estimated Production = 0.36 MMT										

# FLOUR QUALITY

Production Zone	Wheat Protein Range 12% mb %	Flour Yield %	Flour Ash 14% mb %	Flour Protein 14% mb %	Flour Color			Wet Gluten 14% mb %	Falling Number 14% mb seconds	Amylograph Peak Viscosity BU	
					L*	a*	b*				
<b>North Central</b>	<8.5	68.0	0.42	6.7	92.5	-2.5	8.7	13.6	317	498	
	8.5-9.4	65.1	0.42	7.7	92.6	-2.4	8.5	19.8	330	535	
	Soft White	9.5-10.4	69.7	0.41	8.4	92.5	-2.3	8.5	18.6	342	484
	Wheat Estimated	10.5-12.0	66.5	0.37	9.4	92.6	-2.3	8.0	21.1	361	633
	Production =	>12.0	66.4	0.45	10.9	92.4	-2.1	8.0	33.5	362	600
	1.08 MMT	<b>2007 Av.</b>	<b>67.3</b>	<b>0.41</b>	<b>8.2</b>	<b>92.5</b>	<b>-2.4</b>	<b>8.4</b>	<b>19.1</b>	<b>338</b>	<b>540</b>
		2006 Av.	69.1	0.41	8.2	92.5	-2.3	7.9	20.4	332	585
	3 Year Av.	67.4	0.39	8.3	92.5	-2.4	8.1	20.0	349	592	
<b>Northeast</b>	<8.5	71.3	0.41	6.9	92.5	-2.3	8.4	12.7	360	500	
	8.5-9.4	69.5	0.38	7.5	92.6	-2.3	8.5	14.0	323	554	
	Soft White	9.5-10.4	68.7	0.38	8.4	92.6	-2.3	8.4	18.4	315	557
	Wheat Estimated	10.5-12.0	67.1	0.38	9.3	92.5	-2.2	8.2	25.8	354	593
	Production =	>12.0	68.0	0.42	10.9	92.3	-2.1	7.9	31.6	318	656
	1.45 MMT	<b>2007 Av.</b>	<b>68.1</b>	<b>0.39</b>	<b>9.2</b>	<b>92.5</b>	<b>-2.2</b>	<b>8.2</b>	<b>23.8</b>	<b>331</b>	<b>594</b>
		2006 Av.	70.5	0.41	9.0	92.3	-2.4	8.1	23.8	336	492
	3 Year Av.	68.8	0.40	8.7	92.4	-2.3	8.1	23.6	344	549	
<b>Central</b>	<8.5	68.4	0.41	6.6	92.7	-2.4	8.7	10.6	361	475	
	8.5-9.4	67.1	0.40	7.5	92.6	-2.3	8.4	15.5	368	506	
	Soft White	9.5-10.4	69.4	0.41	8.7	92.4	-2.3	8.4	23.4	306	575
	Wheat Estimated	10.5-12.0	67.5	0.40	9.5	92.4	-2.1	7.9	26.5	355	602
	Production =	>12.0	66.6	0.48	11.4	92.0	-2.1	8.3	32.5	379	572
	1.25 MMT	<b>2007 Av.</b>	<b>67.8</b>	<b>0.42</b>	<b>8.5</b>	<b>92.4</b>	<b>-2.3</b>	<b>8.3</b>	<b>20.6</b>	<b>355</b>	<b>540</b>
		2006 Av.	70.0	0.43	8.8	92.3	-2.3	8.0	21.5	357	496
	3 Year Av.	67.5	0.40	8.5	92.4	-2.4	8.3	22.2	367	500	
<b>Southeast</b>	<8.5	68.1	0.41	6.6	92.6	-2.4	8.2	14.5	334	571	
	8.5-9.4	67.9	0.42	7.8	92.5	-2.3	8.3	18.6	343	556	
	Soft White	9.5-10.4	67.3	0.42	8.1	92.6	-2.2	7.6	21.7	317	450
	Wheat Estimated	10.5-12.0	70.0	0.45	9.2	92.2	-2.0	7.6	26.5	340	536
	Production =	>12.0	65.7	0.54	10.6	92.2	-2.0	7.3	29.0	323	757
	0.63 MMT	<b>2007 Av.</b>	<b>68.6</b>	<b>0.44</b>	<b>8.4</b>	<b>92.4</b>	<b>-2.2</b>	<b>7.8</b>	<b>22.4</b>	<b>335</b>	<b>543</b>
		2006 Av.	69.3	0.45	8.8	92.4	-2.3	7.5	22.9	323	502
	3 Year Av.	68.3	0.44	8.5	92.4	-2.3	7.6	23.0	335	516	
<b>White Club Wheat</b>	<b>2007 Av.</b>	<b>70.0</b>	<b>0.42</b>	<b>9.0</b>	<b>92.3</b>	<b>-2.1</b>	<b>7.9</b>	<b>18.3</b>	<b>325</b>	<b>562</b>	
	2006 Av.	71.3	0.43	8.6	92.1	-2.1	7.2	17.8	343	620	
	3 Year Av.	69.6	0.41	8.4	92.3	-2.2	7.4	18.9	341	571	
Estimated Production =											
0.36 MMT											

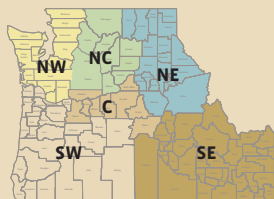


# PHYSICAL DOUGH PROPERTIES

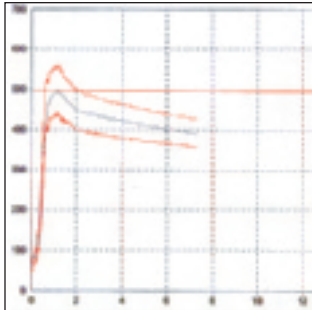
Production Zone	Wheat Protein Range 12% mb %	Farinograph			Alveograph			
		Absorption 14% mb %	Peak Time minutes	Stability minutes	P mm	L mm	P/L	W 10 <sup>4</sup> joules
North Central  Soft White Wheat Estimated Production = 1.08 MMT	<8.5	51.0	1.5	3.0	42	72	0.58	91
	8.5-9.4	52.9	1.0	4.3	43	99	0.43	111
	9.5-10.4	53.3	1.8	4.9	42	116	0.36	113
	10.5-12.0	53.8	1.8	6.2	45	117	0.38	132
	>12.0	54.4	3.1	5.1	42	168	0.25	151
	<b>2007 Average</b>	<b>52.7</b>	<b>1.6</b>	<b>4.5</b>	<b>43</b>	<b>104</b>	<b>0.48</b>	<b>113</b>
	2006 Average	53.2	1.5	4.6	47	93	0.48	132
3 Year Average	52.8	1.7	4.8	44	107	0.37	130	
Northeast  Soft White Wheat Estimated Production = 1.45 MMT	<8.5	54.2	1.2	1.4	52	44	1.18	79
	8.5-9.4	53.7	1.2	2.7	48	68	0.71	95
	9.5-10.4	53.6	1.5	4.7	45	106	0.42	117
	10.5-12.0	54.2	1.9	5.3	45	120	0.38	131
	>12.0	54.5	2.7	4.3	38	164	0.23	130
	<b>2007 Average</b>	<b>54.1</b>	<b>1.9</b>	<b>4.5</b>	<b>44</b>	<b>121</b>	<b>0.37</b>	<b>122</b>
	2006 Average	54.2	1.8	4.7	42	117	0.37	121
3 Year Average	54.1	1.8	4.3	42	121	0.33	120	
Central  Soft White Wheat Estimated Production = 1.25 MMT	<8.5	53.5	1.2	1.6	42	45	0.93	59
	8.5-9.4	54.4	1.4	2.3	50	64	0.78	89
	9.5-10.4	53.9	1.8	3.8	41	92	0.45	93
	10.5-12.0	54.0	2.2	3.6	38	120	0.32	104
	>12.0	56.0	2.1	2.7	37	157	0.24	104
	<b>2007 Average</b>	<b>54.3</b>	<b>1.7</b>	<b>2.7</b>	<b>42</b>	<b>90</b>	<b>0.44</b>	<b>88</b>
	2006 Average	54.5	1.9	3.4	44	99	0.44	107
3 Year Average	53.8	1.7	3.2	41	100	0.34	98	
Southeast  Soft White Wheat Estimated Production = 0.63 MMT	<8.5	52.1	1.4	2.7	34	60	0.57	54
	8.5-9.4	53.0	1.4	2.9	34	77	0.44	60
	9.5-10.4	53.1	1.2	2.4	33	92	0.36	63
	10.5-12.0	52.3	1.9	3.8	29	137	0.21	72
	>12.0	52.8	3.4	5.4	34	200	0.17	129
	<b>2007 Average</b>	<b>52.5</b>	<b>1.7</b>	<b>3.3</b>	<b>32</b>	<b>109</b>	<b>0.27</b>	<b>68</b>
	2006 Average	53.1	2.0	3.6	34	125	0.27	91
3 Year Average	52.9	1.8	3.4	32	117	0.26	77	
White Club Wheat  Estimated Production = 0.36 MMT	<b>2007 Average</b>	<b>52.1</b>	<b>1.7</b>	<b>2.3</b>	<b>27</b>	<b>77</b>	<b>0.35</b>	<b>43</b>
	2006 Average	52.9	1.2	1.8	30	77	0.39	52
	3 Year Average	52.2	1.4	2.0	27	82	0.33	47

# FINISHED PRODUCTS

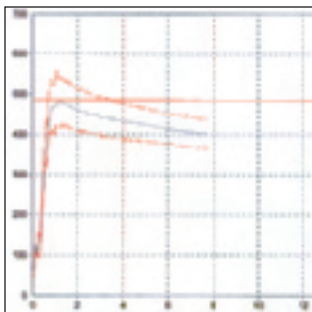
Production Zone	Wheat Protein Range 12% mb %	Sugar Snap Cookie			Sponge Cake		Chinese Southern Type Steamed Bread	
		Spread cm	Spread Factor width/height	Top Grain Score	Volume cc	Total Score	Specific Volume cc/g	Total Score
North Central Soft White Wheat Estimated Production = 1.08 MMT	<8.5	8.5	10.0	4.5	1234	48	2.37	66
	8.5-9.4	8.4	9.0	2.0	1234	49	2.50	66
	9.5-10.4	8.1	8.5	2.0	1172	37	2.49	66
	10.5-12.0	8.0	7.8	0.5	1193	46	2.89	70
	>12.0	8.1	7.9	0.0	1246	48	2.77	67
	<b>2007 Average</b>	<b>8.3</b>	<b>8.8</b>	<b>2.2</b>	<b>1212</b>	<b>45</b>	<b>2.57</b>	<b>67</b>
	2006 Average	8.2	7.9	1.5	1180	50	2.49	72
3 Year Average	8.3	—	1.7	1194	48	2.59	69	
Northeast Soft White Wheat Estimated Production = 1.45 MMT	<8.5	8.1	8.0	2.5	1237	49	2.39	68
	8.5-9.4	8.1	8.1	2.0	1245	53	2.43	66
	9.5-10.4	8.1	8.1	1.0	1241	53	2.54	70
	10.5-12.0	8.0	7.4	0.5	1222	51	2.69	68
	>12.0	7.9	7.2	0.0	1232	49	2.81	67
	<b>2007 Average</b>	<b>8.0</b>	<b>7.6</b>	<b>0.7</b>	<b>1232</b>	<b>51</b>	<b>2.65</b>	<b>68</b>
	2006 Average	8.0	7.6	0.7	1161	48	2.48	70
3 Year Average	8.1	—	1.3	1193	51	2.59	69	
Central Soft White Wheat Estimated Production = 1.25 MMT	<8.5	8.2	8.1	3.0	1202	52	2.12	61
	8.5-9.4	8.1	7.7	2.5	1188	53	2.23	63
	9.5-10.4	8.1	7.3	1.0	1219	52	2.48	64
	10.5-12.0	8.0	7.4	0.5	1198	52	2.69	66
	>12.0	7.9	7.2	0.0	1201	52	2.77	67
	<b>2007 Average</b>	<b>8.1</b>	<b>7.6</b>	<b>1.6</b>	<b>1201</b>	<b>52</b>	<b>2.43</b>	<b>64</b>
	2006 Average	8.0	7.1	0.8	1143	48	2.45	69
3 Year Average	8.0	—	1.1	1175	50	2.49	67	
Southeast Soft White Wheat Estimated Production = 0.63 MMT	<8.5	8.4	9.0	4.5	1258	59	2.19	65
	8.5-9.4	8.4	9.1	4.0	1238	50	2.17	63
	9.5-10.4	8.4	8.8	4.0	1200	53	2.24	64
	10.5-12.0	8.4	8.8	1.5	1248	52	2.49	67
	>12.0	8.2	8.1	1.0	1217	48	2.70	70
	<b>2007 Average</b>	<b>8.4</b>	<b>8.9</b>	<b>2.8</b>	<b>1238</b>	<b>53</b>	<b>2.35</b>	<b>66</b>
	2006 Average	8.2	7.8	1.2	1168	52	2.42	70
3 Year Average	8.3	—	2.2	1198	52	2.47	67	
White Club Wheat Estimated Production = 0.36 MMT	<b>2007 Average</b>	<b>8.5</b>	<b>10.0</b>	<b>4.5</b>	<b>1263</b>	<b>53</b>	<b>2.90</b>	<b>67</b>
	2006 Average	8.5	8.9	2.0	1221	53	2.60	67
	3 Year Average	8.6	—	3.8	1216	51	2.69	65



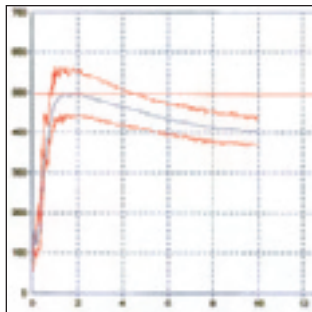
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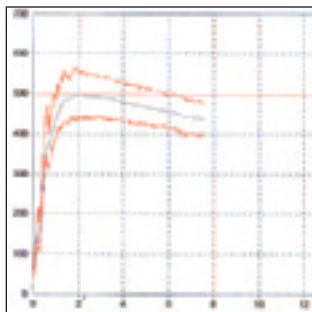
<8.5% Wheat Protein Range



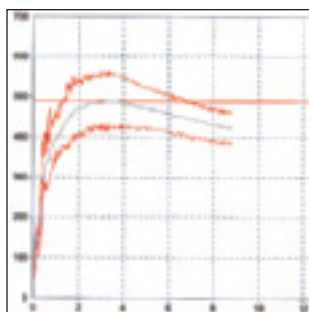
8.5-9.4% Wheat Protein Range



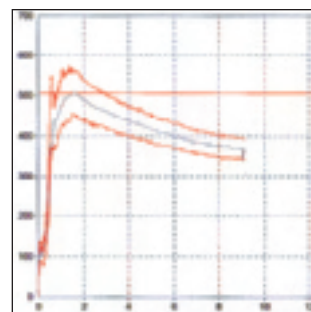
9.5-10.4% Wheat Protein Range



10.5-12.0% Wheat Protein Range

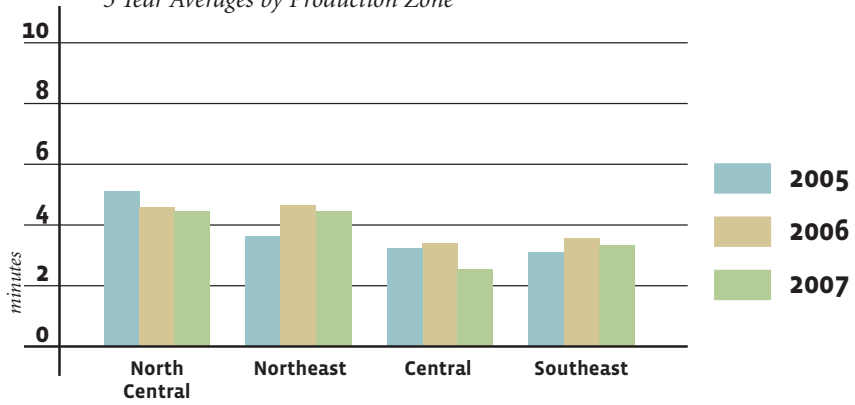


>12.0% Wheat Protein Range

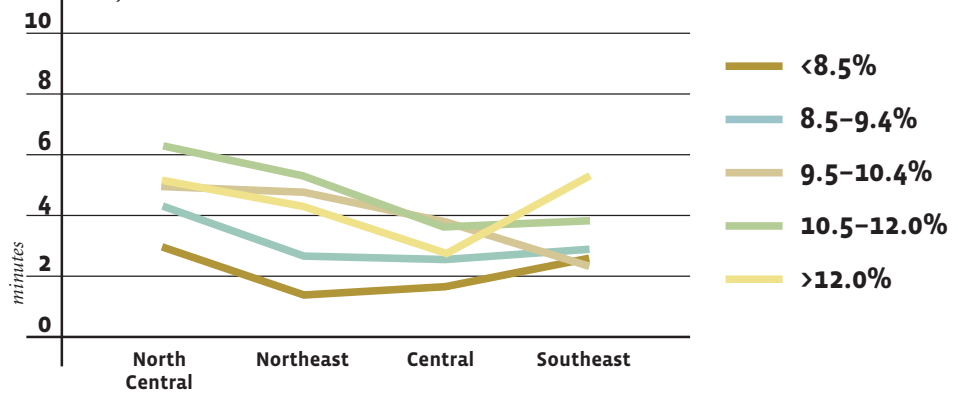


White Club Wheat

## PNW Soft White Wheat Farinograph Stability 3 Year Averages by Production Zone

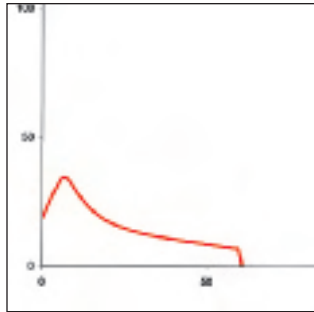


## PNW Soft White Wheat Farinograph Stability by Protein and Production Zone, 2007

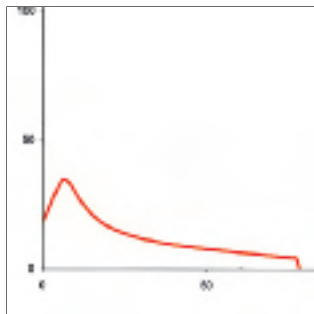




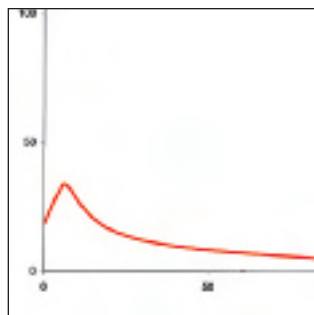
# ALVEOGRAPH



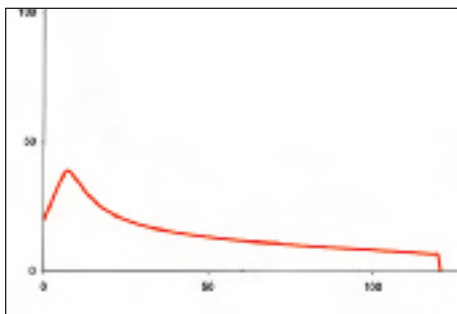
<8.5% Wheat Protein Range



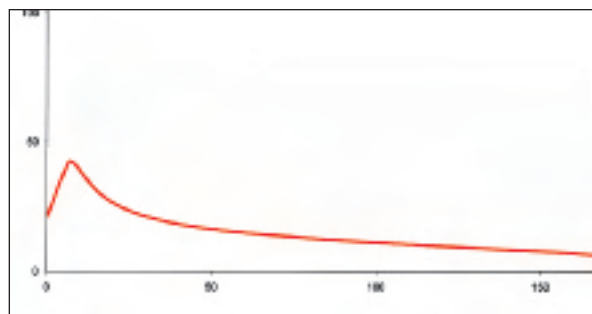
8.5-9.4% Wheat Protein Range



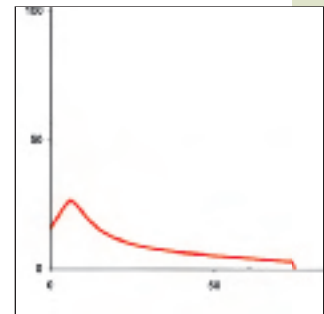
9.5-10.4% Wheat Protein Range



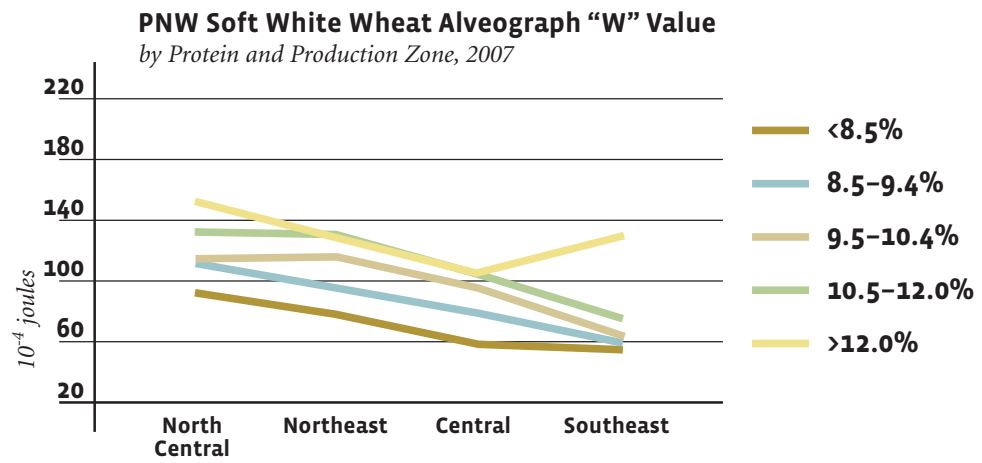
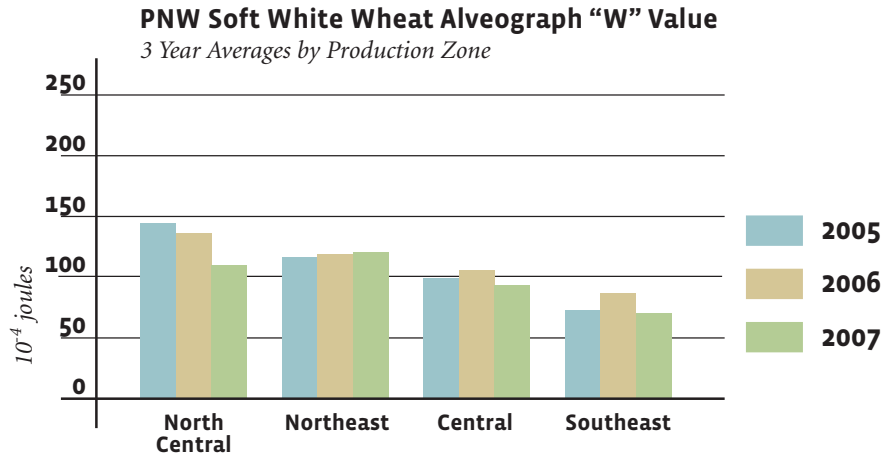
10.5-12.0% Wheat Protein Range



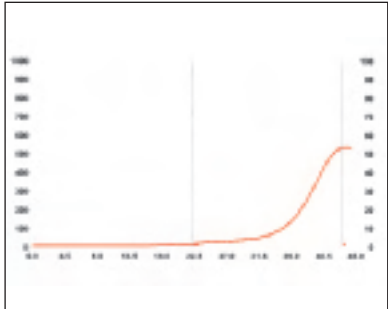
>12.0% Wheat Protein Range



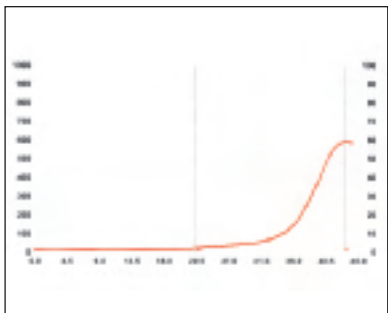
White Club Wheat



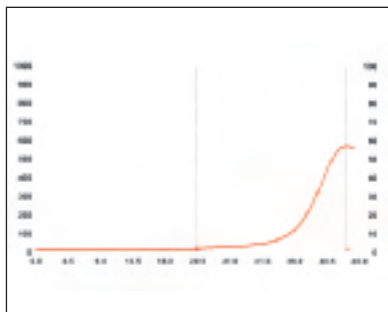
# AMYLOGRAPH



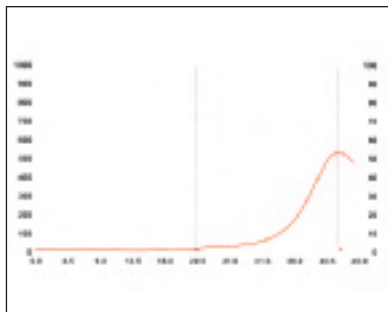
North Central Production Zone



Northeast Production Zone

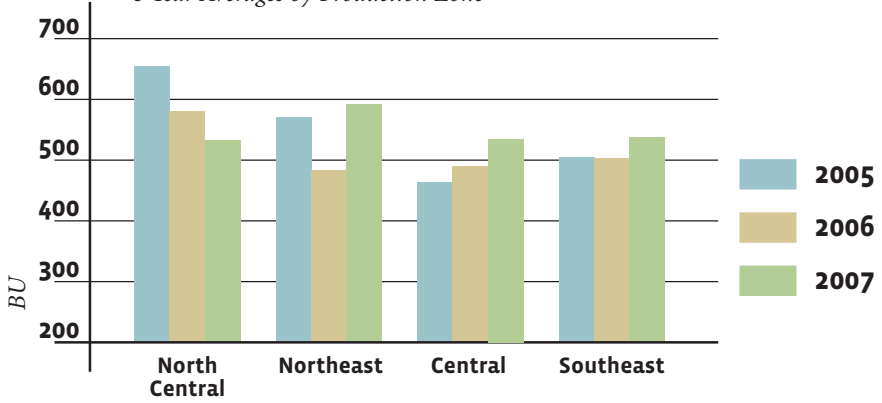


Central Production Zone

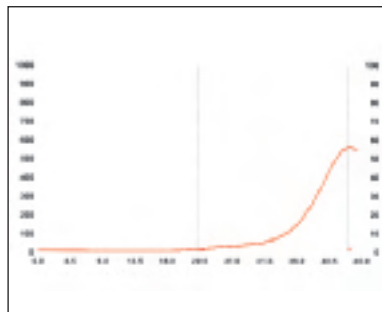
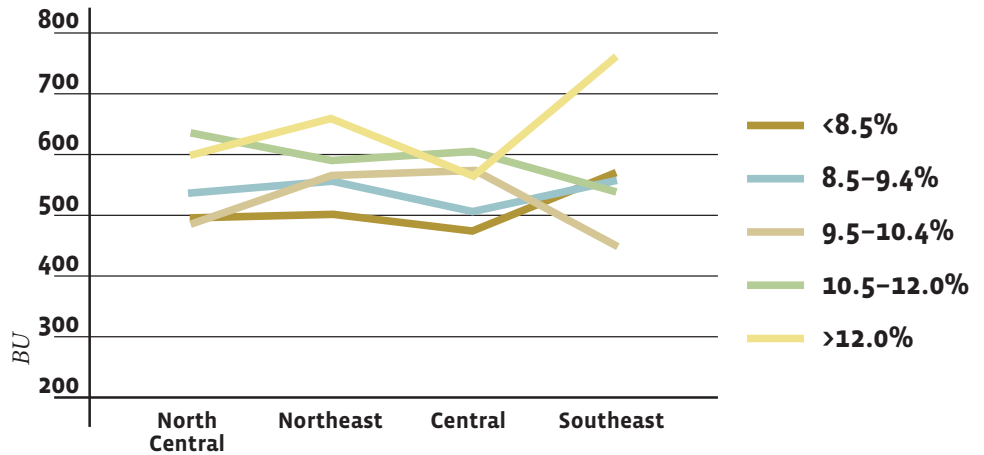


Southeast Production Zone

**PNW Soft White Wheat Amylograph Peak Viscosity**  
3 Year Averages by Production Zone

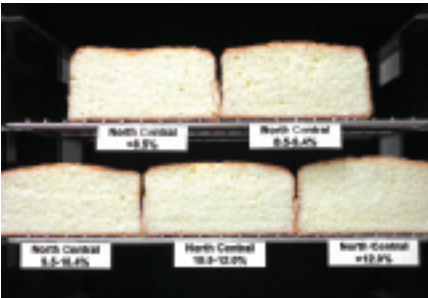


**PNW Soft White Wheat Amylograph Peak Viscosity**  
by Protein and Production Zone, 2007

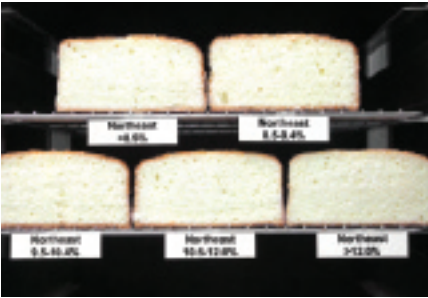


White Club Wheat

# SPONGE CAKE



North Central Production Zone



Northeast Production Zone

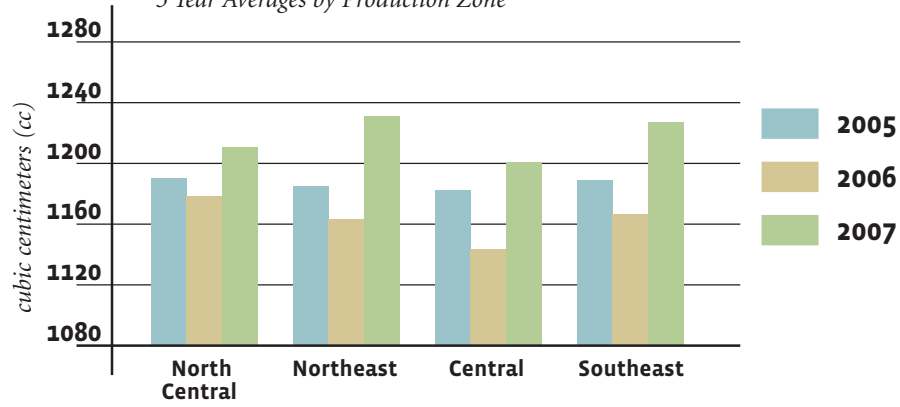


Central Production Zone

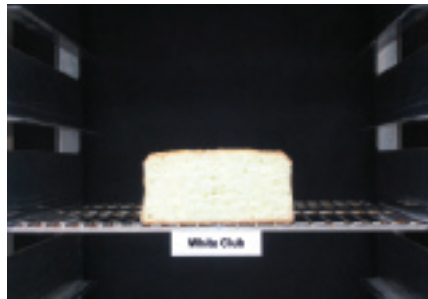
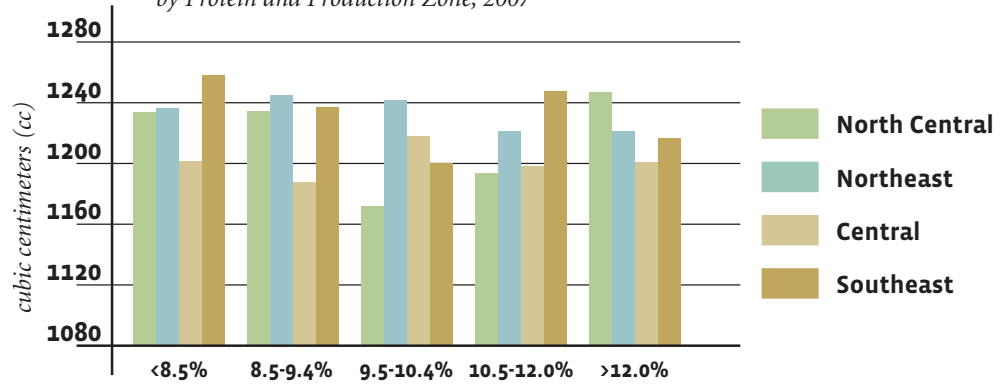


Southeast Production Zone

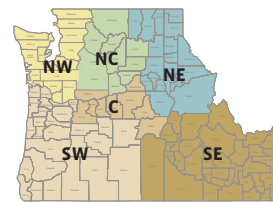
**PNW Soft White Wheat Sponge Cake Volume**  
3 Year Averages by Production Zone



**PNW Soft White Wheat Sponge Cake Volume**  
by Protein and Production Zone, 2007



White Club Wheat



## SUMMARY

These results were from composite samples of the Pacific Northwest soft white wheat and white club wheat harvest. Composite samples were prepared by production zone and protein levels. These composite samples were analyzed for wheat and flour quality, physical dough properties, and finished product characteristics for the 2005, 2006, and 2007 harvests. Information on the 2007 harvest is summarized as follows:

### 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, Northeast, and Central Production Zones. Wheat samples from the Central and Southeast Production Zones 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 most protein ranges in samples from North Central, Northeast, Central, and Southeast Production Zones.

### 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 weaker gluten strength than soft white wheat, as indicated by alveograph W values.

### Finished Products

Within a production zone, lower protein samples made better sugar snap cookies. Average sponge cake scores and volumes were higher in samples from the Central, Northeast, and Southeast Production Zones. Steamed bread specific volumes generally increased with increasing protein content.

### Wheat Marketing Center

1200 NW Naito Parkway  
#230  
Portland, Oregon  
97209-2831  
503.295.0823  
fax 503.295.2735  
info@wmcinc.org  
www.wmcinc.org



[www.idahowheat.org](http://www.idahowheat.org)



Washington  
Wheat Commission

[www.wawheat.com](http://www.wawheat.com)



[www.owgl.org](http://www.owgl.org)



[www.uswheat.org](http://www.uswheat.org)



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