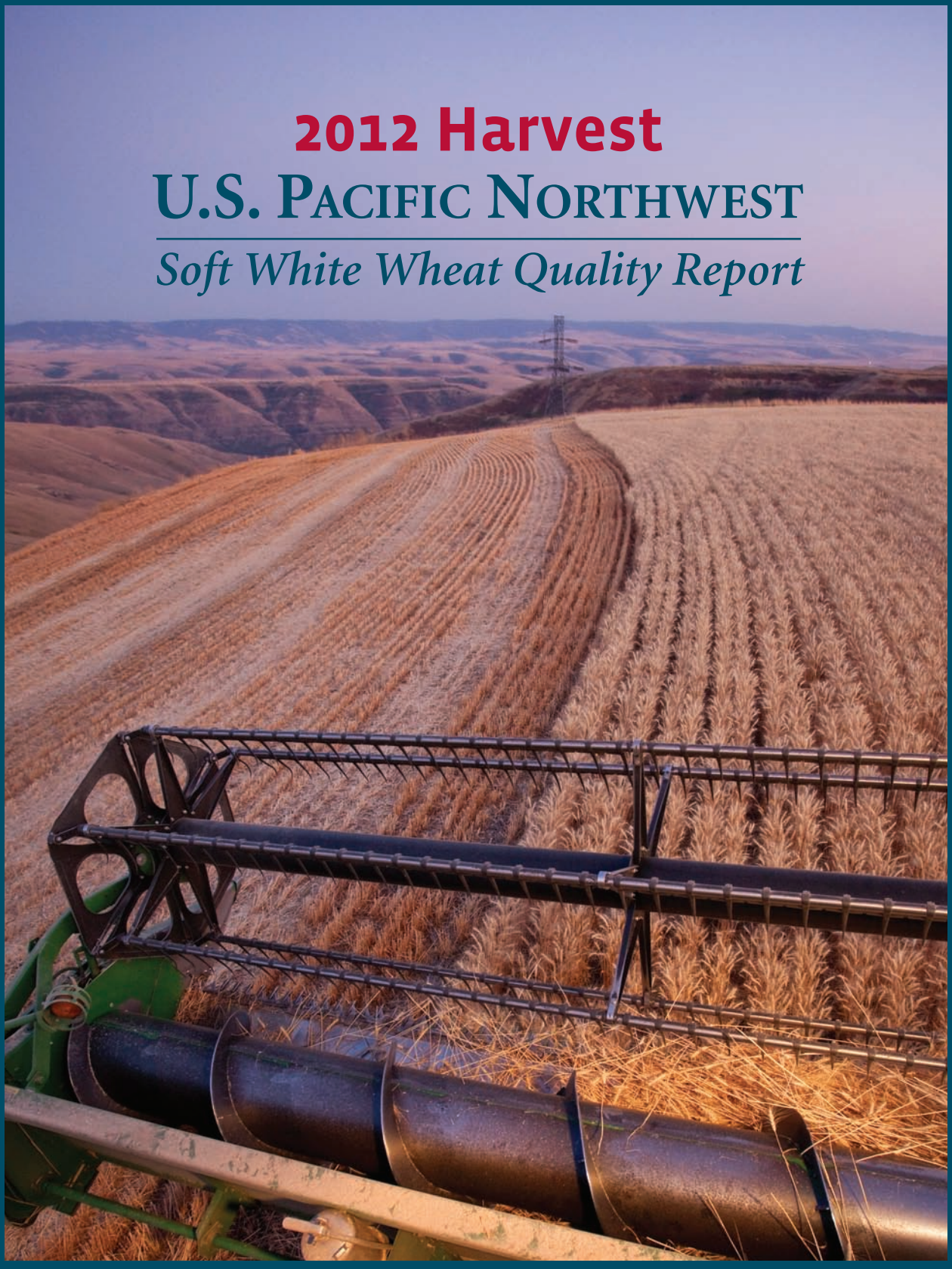
2012 Harvest
U.S. Pacific Northwest
Soft White Wheat Quality Report



This project is funded by the Washington Grain Commission, Oregon Wheat Commission, Idaho Wheat Commission, Wheat Marketing Center, Inc., and U.S. Wheat Associates

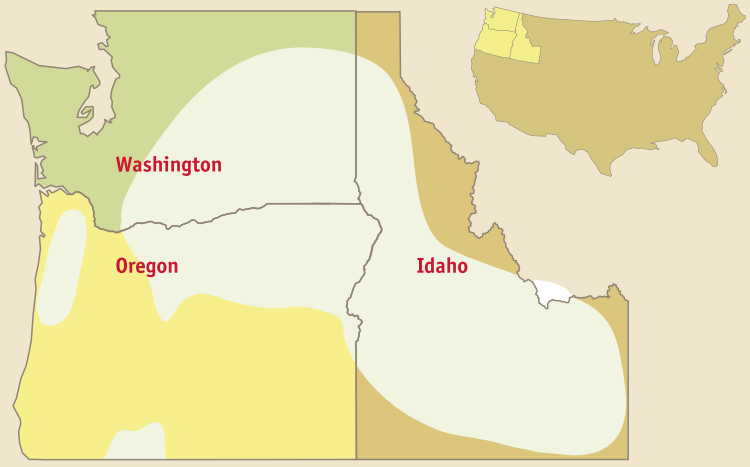
THE PACIFIC NORTHWEST

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, flat breads, and Chinese southern-type steamed breads.

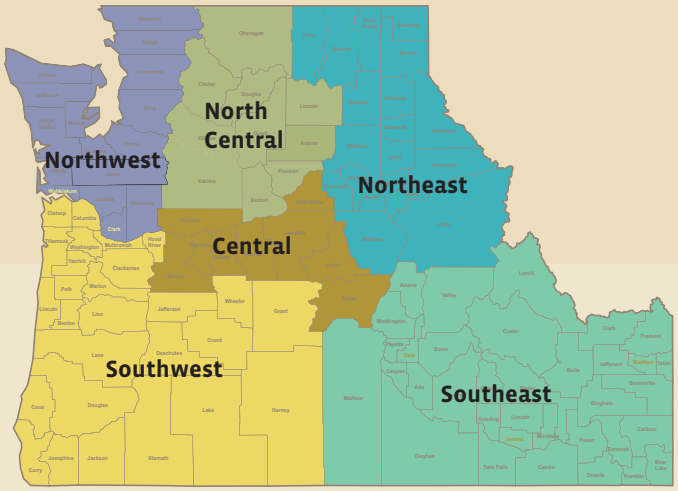
The soft white wheat class includes the subclasses of white club wheat and western white wheat. White club wheat has very weak gluten characteristics. Western white wheat is a blend of the white club wheat subclass and soft white wheat. The amount of white club wheat in western white wheat ranges from 10 to 90 percent. The minimum percentage of white club wheat in western white wheat is 10 percent and any higher amounts are contract specifications that are negotiated between buyer and seller.

Wheat Growing Areas of the Pacific Northwest



Cover photo: Peter Roise
Above: Idaho Wheat Commission

WHEAT PRODUCTION ZONES



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. Sample collection was based on wheat production. For the 2012 harvest, Wheat Marketing Center received 553 soft white wheat and 55 white club wheat samples from the states of Idaho, Oregon, and Washington.

Federal Grain Inspection Service (FGIS) graded each sample. Wheat Marketing Center conducted wheat, flour, dough, and finished product tests on composites based on production zones and protein levels.

The major soft white wheat varieties were ORCF-102, ORCF-101, Westbred 528, Eltan, and Louise. The major club wheat variety was Bruehl.

2012 Weather

The Pacific Northwest had adequate soil moisture at planting. Most of the wheat production area received adequate rainfall during the winter and spring. Generally cool temperatures prevailed during the growing season. Hot, dry conditions occurred during the end of wheat kernel development and continued during wheat harvest.

2012 Soft White and White Club Wheat Production

By production zone

Wheat production estimates courtesy of Washington Grain Commission

Production Zone	Million Metric Tons (MMT)	Million Bushels
North Central	2.01	73.8
Northeast	1.84	67.5
Central	1.35	49.7
Southeast	0.71	26.1
Southwest	0.48	17.6
Northwest	0.01	0.4
Total	**6.40**	**235.1**

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	1SWH	61.0	0.2	9.2	353	1.25	32.5	31	17.6
	8.5-9.4	1SWH	61.5	0.3	8.8	345	1.27	36.5	32	19.9
Soft White Wheat Estimated Production = 1.66 MMT	9.5-10.4	1SWH	61.7	0.2	8.6	334	1.26	34.8	38	22.2
	10.5-12.0	1SWH	61.7	0.3	8.9	356	1.28	34.0	31	24.3
	>12.0	1SWH	61.8	0.4	8.5	361	1.39	32.6	37	32.4
	2012 Average	**1SWH**	**61.6**	**0.3**	**8.8**	**348**	**1.28**	**34.5**	**34**	**22.7**
	2011 Average	1SWH	60.9	0.4	9.4	314	1.23	34.6	33	21.2
	3 Year Average	1SWH	60.5	0.5	9.4	331	1.26	33.7	31	23.6
Northeast	8.5-9.4	1SWH	61.9	0.2	8.9	330	1.29	34.3	33	19.2
	9.5-10.4	1SWH	62.0	0.3	9.2	334	1.33	34.7	34	20.7
Soft White Wheat Estimated Production = 1.77 MMT	10.5-12.0	1SWH	61.6	0.4	9.2	361	1.38	34.7	35	25.0
	2012 Average	**1SWH**	**61.9**	**0.3**	**9.1**	**341**	**1.34**	**34.6**	**34**	**21.6**
	2011 Average	1SWH	61.5	0.6	9.4	302	1.34	33.8	35	20.0
	3 Year Average	1SWH	60.5	0.6	9.6	318	1.36	33.3	34	22.5
Central	<8.5	1SWH	61.5	0.4	10.4	354	1.27	37.4	40	15.4
	8.5-9.4	1SWH	61.5	0.4	9.9	323	1.26	36.3	40	19.3
Soft White Wheat Estimated Production = 1.31 MMT	9.5-10.4	1SWH	61.8	0.3	10.0	332	1.24	36.9	38	21.0
	10.5-12.0	1SWH	61.1	0.4	9.4	341	1.33	35.1	37	23.9
	>12.0	2SWH	59.5	0.3	9.7	360	1.37	32.7	35	30.9
	2012 Average	**1SWH**	**61.4**	**0.4**	**9.9**	**338**	**1.28**	**36.2**	**39**	**20.5**
	2011 Average	1SWH	61.1	0.4	9.5	314	1.28	35.2	36	15.7
	3 Year Average	1SWH	60.5	0.5	9.1	331	1.32	33.9	36	20.7
Southeast	8.5-9.4	1SWH	61.5	0.1	9.3	304	1.49	35.1	29	18.8
	9.5-10.4	1SWH	61.8	0.1	9.0	356	1.52	37.8	33	20.1
Soft White Wheat Estimated Production = 0.71 MMT	10.5-12.0	1SWH	62.1	0.1	8.9	333	1.57	35.2	34	24.4
	2012 Average	**1SWH**	**61.8**	**0.1**	**9.0**	**337**	**1.53**	**36.4**	**32**	**21.0**
	2011 Average	1SWH	61.0	1.0	9.5	318	1.51	35.0	35	21.9
	3 Year Average	1SWH	60.5	0.9	9.6	321	1.55	35.3	33	22.3
Southwest	<8.5	1SWH	61.4	0.2	10.8	310	1.37	39.2	35	13.1
	8.5-9.4	1SWH	61.6	0.3	11.1	298	1.41	38.1	37	16.8
Soft White Wheat Estimated Production = 0.48 MMT	9.5-10.4	1SWH	61.8	0.4	9.9	340	1.44	35.0	39	22.4
	10.5-12.0	1SWH	61.3	0.4	10.1	325	1.46	36.4	33	27.1
	2012 Average	**1SWH**	**61.5**	**0.3**	**10.6**	**316**	**1.42**	**37.3**	**36**	**19.1**
	2011 Average	1SWH	60.9	0.4	11.6	307	1.41	38.3	36	18.5
	3 Year Average	1SWH	61.0	0.5	11.1	323	1.42	37.5	36	18.4
White Club Wheat	**2012 Average**	**1WHCB**	**60.3**	**0.7**	**8.9**	**308**	**1.31**	**33.3**	**32**	**17.4**
	2011 Average	1WHCB	59.9	1.0	9.2	284	1.23	33.0	35	13.1
Estimated Production = 0.46 MMT	3 Year Average	1WHCB	59.7	1.0	9.2	317	1.29	31.2	33	19.1

FLOUR QUALITY

Production Zone	Wheat Protein Range 12% mb %	Flour Yield %	Flour Ash 14% mb %	Flour Protein 14% mb %	Flour Color L*	Flour Color a*	Flour Color b*	Wet Gluten 14% mb %	Falling Number 14% mb seconds	Amylograph Peak Viscosity BU
North Central	<8.5	75.3	0.46	7.3	92.0	-2.5	8.1	13.8	336	500
	8.5-9.4	77.7	0.47	7.8	92.0	-2.5	7.9	16.2	364	477
Soft White Wheat Estimated Production = 1.66 MMT	9.5-10.4	76.5	0.46	8.8	91.8	-2.5	7.8	18.9	329	448
	10.5-12.0	77.8	0.47	9.8	92.0	-2.4	7.5	28.3	332	504
	>12.0	75.2	0.50	12.0	91.3	-2.3	7.4	29.8	368	528
	2012 Av.	**77.0**	**0.47**	**9.0**	**91.9**	**-2.4**	**7.7**	**21.7**	**342**	**486**
	2011 Av.	75.3	0.49	7.9	92.1	-2.5	8.0	18.3	350	446
	3 Year Av.	72.4	0.46	8.5	92.4	-2.5	8.0	19.8	369	483
Northeast	8.5-9.4	77.6	0.46	8.1	91.6	-2.4	7.6	15.2	329	424
	9.5-10.4	78.0	0.48	8.7	91.4	-2.3	8.4	18.5	353	451
Soft White Wheat Estimated Production = 1.77 MMT	10.5-12.0	77.2	0.48	9.7	92.0	-2.3	7.8	22.6	361	472
	2012 Av.	**77.7**	**0.47**	**8.9**	**91.6**	**-2.4**	**8.0**	**18.9**	**350**	**451**
	2011 Av.	76.5	0.50	8.3	91.8	-2.4	8.2	19.0	341	430
	3 Year Av.	73.1	0.46	8.5	92.2	-2.4	8.1	21.1	342	454
Central	<8.5	77.1	0.48	7.1	91.8	-2.6	8.8	13.7	355	452
	8.5-9.4	76.9	0.49	7.9	93.1	-2.6	8.7	19.8	339	557
Soft White Wheat Estimated Production = 1.31 MMT	9.5-10.4	77.2	0.50	8.9	91.8	-2.5	8.6	22.0	344	496
	10.5-12.0	76.8	0.52	9.9	92.0	-2.3	8.0	27.0	351	478
	>12.0	77.0	0.54	11.7	92.1	-2.3	8.3	34.7	388	526
	2012 Av.	**77.0**	**0.50**	**8.6**	**92.2**	**-2.5**	**8.5**	**21.4**	**349**	**502**
	2011 Av.	75.7	0.49	7.8	91.5	-2.5	8.3	15.6	333	519
	3 Year Av.	72.4	0.48	8.3	92.0	-2.5	8.2	19.2	350	528
Southeast	8.5-9.4	76.9	0.53	8.2	91.9	-2.5	8.2	20.4	316	458
	9.5-10.4	77.2	0.55	8.9	91.9	-2.4	8.1	22.8	359	403
Soft White Wheat Estimated Production = 0.71 MMT	10.5-12.0	75.2	0.57	10.1	92.3	-2.4	8.1	25.5	369	449
	2012 Av.	**76.6**	**0.55**	**9.1**	**92.0**	**-2.4**	**8.1**	**23.0**	**352**	**429**
	2011 Av.	76.7	0.54	8.9	90.9	-2.3	7.9	21.3	328	461
	3 Year Av.	73.3	0.49	8.7	91.9	-2.3	8.0	20.8	345	428
Southwest	<8.5	76.3	0.53	6.8	92.1	-2.5	7.9	11.7	311	395
	8.5-9.4	76.9	0.54	7.5	91.3	-2.3	7.8	16.0	337	407
Soft White Wheat Estimated Production = 0.48 MMT	9.5-10.4	77.3	0.54	8.8	91.8	-2.2	7.5	20.2	335	421
	10.5-12.0	76.6	0.54	10.2	91.7	-2.1	7.4	24.2	356	516
	2012 Av.	**76.8**	**0.54**	**8.1**	**91.7**	**-2.3**	**7.7**	**17.4**	**333**	**427**
	2011 Av.	75.6	0.52	7.5	90.5	-2.4	8.2	15.7	317	319
	3 Year Av.	72.4	0.47	7.5	91.8	-2.3	8.0	16.0	329	401
White Club Wheat	**2012 Av.**	**75.3**	**0.49**	**9.1**	**91.9**	**-2.4**	**7.7**	**23.5**	**353**	**464**
	2011 Av.	77.1	0.48	8.0	92.3	-2.6	7.8	10.4	312	458
Estimated Production = 0.46 MMT	3 Year Av.	72.4	0.45	9.2	92.1	-2.3	7.6	19.5	356	517

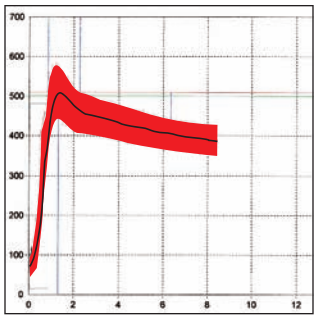
PHYSICAL DOUGH PROPERTIES

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^{-4} joules
North Central	<8.5	52.2	1.4	1.9	48	83	0.58	107
Soft White Wheat Estimated Production = 1.66 MMT	8.5-9.4	53.2	1.5	2.8	47	95	0.49	109
	9.5-10.4	53.6	1.5	4.4	45	112	0.40	114
	10.5-12.0	54.1	3.5	4.9	44	161	0.27	143
	>12.0	57.1	3.7	4.1	44	219	0.20	168
	2012 Average	**53.8**	**2.3**	**3.9**	**45**	**130**	**0.38**	**126**
	2011 Average	52.9	1.9	2.6	42	99	0.48	95
	3 Year Average	53.5	2.0	4.2	51	110	0.51	138
Northeast	8.5-9.4	52.5	1.5	3.3	40	112	0.36	107
Soft White Wheat Estimated Production = 1.77 MMT	9.5-10.4	52.8	1.5	2.7	33	140	0.24	85
	10.5-12.0	53.5	1.5	4.0	35	145	0.24	105
	2012 Average	**52.9**	**1.5**	**3.2**	**35**	**135**	**0.27**	**96**
	2011 Average	53.2	1.6	2.4	38	97	0.41	81
	3 Year Average	53.9	2.0	3.4	46	100	0.51	108
Central	<8.5	53.6	1.4	1.4	47	62	0.76	81
Soft White Wheat Estimated Production = 1.31 MMT	8.5-9.4	53.8	1.4	2.4	44	93	0.47	87
	9.5-10.4	54.9	1.7	2.9	42	90	0.47	87
	10.5-12.0	54.6	2.1	3.6	38	140	0.27	96
	>12.0	55.7	2.4	2.5	35	198	0.18	103
	2012 Average	**54.3**	**1.7**	**2.5**	**42**	**102**	**0.48**	**89**
	2011 Average	52.5	1.6	2.2	39	93	0.46	80
	3 Year Average	53.6	1.7	2.7	43	98	0.52	99
Southeast	8.5-9.4	52.5	1.3	2.2	32	88	0.36	60
Soft White Wheat Estimated Production = 0.71 MMT	9.5-10.4	54.1	1.4	2.0	30	93	0.32	52
	10.5-12.0	54.6	2.7	3.1	34	124	0.27	75
	2012 Average	**53.9**	**1.7**	**2.4**	**32**	**101**	**0.32**	**60**
	2011 Average	53.6	1.5	2.3	34	102	0.36	64
	3 Year Average	54.1	1.7	2.4	37	95	0.47	69
Southwest	<8.5	53.5	1.5	1.7	49	65	0.75	86
Soft White Wheat Estimated Production = 0.48 MMT	8.5-9.4	53.7	1.7	2.5	44	81	0.54	90
	9.5-10.4	53.3	1.7	3.9	41	144	0.28	117
	10.5-12.0	54.9	2.9	4.3	39	166	0.23	110
	2012 Average	**53.8**	**1.9**	**3.0**	**44**	**107**	**0.48**	**99**
	2011 Average	53.4	1.4	1.9	38	76	0.61	68
	3 Year Average	54.5	1.4	2.4	49	71	0.91	83
White Club Wheat	**2012 Average**	**51.9**	**1.3**	**1.9**	**28**	**98**	**0.29**	**53**
Estimated Production = 0.46 MMT	2011 Average	51.2	1.4	1.5	24	71	0.34	38
	3 Year Average	52.8	1.5	2.1	35	87	0.50	59

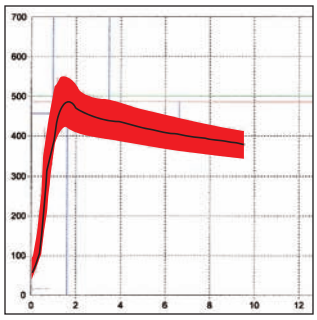
FINISHED PRODUCTS

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	<8.5	8.7	10.8	6.5	1239	52	2.1	67
Soft White Wheat Estimated Production = 1.66 MMT	8.5-9.4	8.7	9.9	6.0	1194	48	2.1	65
	9.5-10.4	8.6	10.1	2.0	1184	45	2.3	67
	10.5-12.0	8.5	9.6	2.5	1170	45	2.3	70
	>12.0	8.2	8.6	1.5	1215	47	2.4	72
	2012 Average	**8.6**	**9.8**	**3.6**	**1190**	**47**	**2.2**	**68**
	2011 Average	8.8	10.7	5.1	1219	49	2.0	69
	3 Year Average	8.6	10.1	3.3	1206	51	2.1	68
Northeast	8.5-9.4	8.9	10.3	5.0	1245	51	2.1	68
Soft White Wheat Estimated Production = 1.77 MMT	9.5-10.4	8.7	10.5	4.0	1215	48	2.1	69
	10.5-12.0	8.5	8.9	4.0	1190	51	2.3	71
	2012 Average	**8.7**	**10.0**	**4.2**	**1215**	**50**	**2.2**	**69**
	2011 Average	8.7	10.4	5.3	1215	53	2.1	68
	3 Year Average	8.5	9.7	3.5	1195	51	2.1	69
Central	<8.5	8.6	10.1	6.0	1198	54	1.9	65
Soft White Wheat Estimated Production = 1.31 MMT	8.5-9.4	8.6	9.6	4.0	1216	54	2.0	69
	9.5-10.4	8.3	8.6	3.5	1199	48	2.1	67
	10.5-12.0	8.3	8.6	1.5	1169	48	2.3	69
	>12.0	8.2	8.4	0.5	1177	45	2.3	69
	2012 Average	**8.5**	**9.2**	**3.6**	**1196**	**51**	**2.1**	**68**
	2011 Average	8.8	10.1	4.9	1199	48	2.1	66
	3 Year Average	8.6	9.6	3.7	1193	48	2.1	66
Southeast	8.5-9.4	8.9	10.4	6.0	1232	54	2.1	67
Soft White Wheat Estimated Production = 0.71 MMT	9.5-10.4	8.7	10.1	4.0	1226	54	2.0	67
	10.5-12.0	8.6	8.5	1.0	1194	45	2.1	70
	2012 Average	**8.7**	**9.7**	**3.6**	**1218**	**51**	**2.1**	**68**
	2011 Average	8.7	9.7	5.4	1165	45	2.2	65
	3 Year Average	8.7	9.7	3.7	1184	50	2.1	66
Southwest	<8.5	8.6	9.5	5.0	1217	56	1.8	68
Soft White Wheat Estimated Production = 0.48 MMT	8.5-9.4	8.6	9.2	4.0	1178	50	1.9	68
	9.5-10.4	8.5	9.5	3.0	1208	51	1.9	66
	10.5-12.0	8.5	9.5	1.0	1187	49	2.3	70
	2012 Average	**8.6**	**9.4**	**3.5**	**1192**	**52**	**1.9**	**68**
	2011 Average	8.7	9.2	5.3	1174	47	2.0	67
	3 Year Average	8.5	9.2	3.7	1193	52	2.0	67
White Club Wheat	**2012 Average**	**9.1**	**12.0**	**5.5**	**1239**	**53**	**2.3**	**66**
Estimated Production = 0.46 MMT	2011 Average	9.0	11.9	5.5	1247	53	2.1	68
	3 Year Average	8.7	10.7	3.7	1206	49	2.4	66

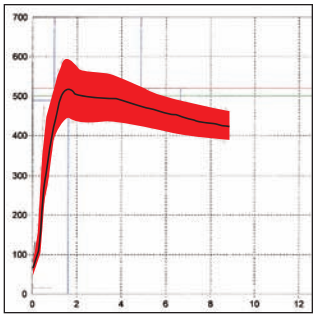
FARINOGRAPH



<8.5 % Wheat Protein Range



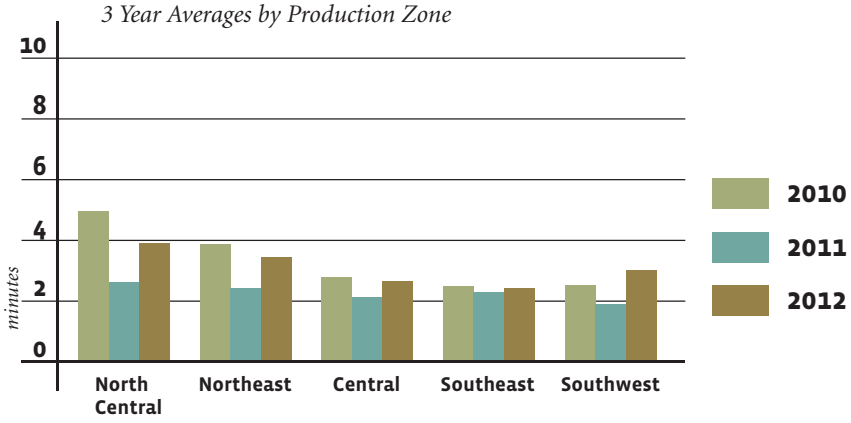
8.5-9.4% Wheat Protein Range



9.5-10.4% Wheat Protein Range

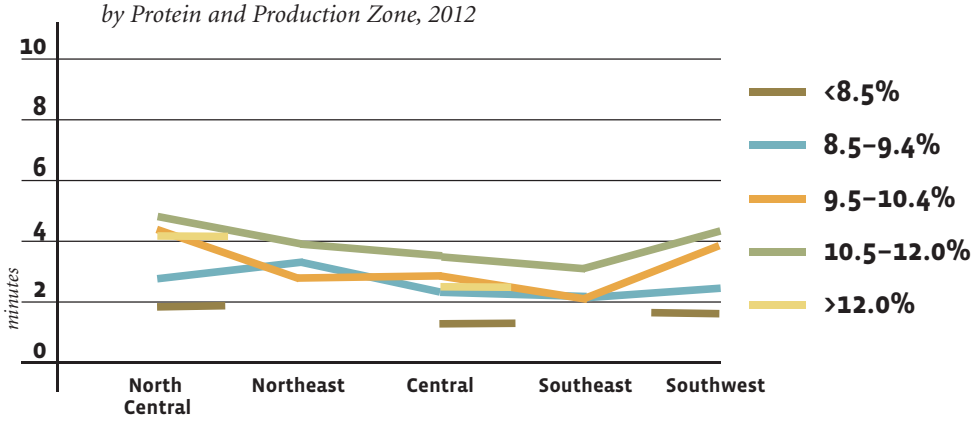
PNW Soft White Wheat Farinograph Stability

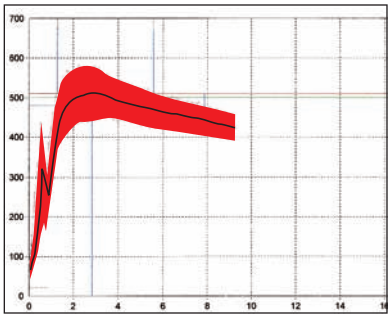
3 Year Averages by Production Zone



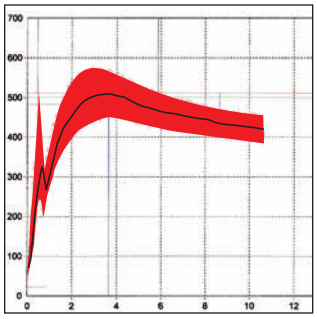
PNW Soft White Wheat Farinograph Stability

by Protein and Production Zone, 2012

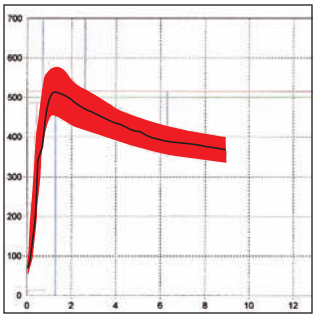




10.5-12.0% Wheat Protein Range

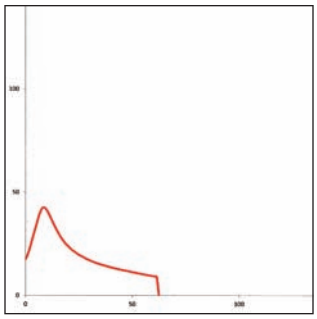


>12.0% Wheat Protein Range

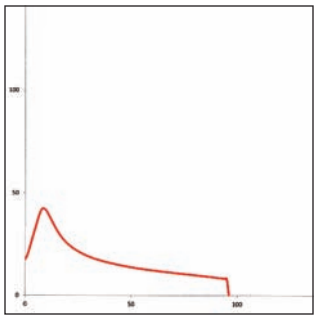


White Club Wheat

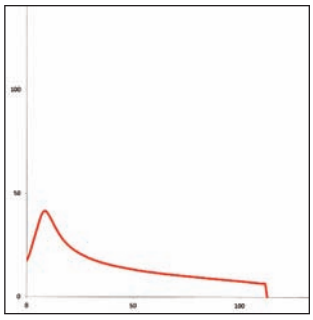
ALVEOGRAPH



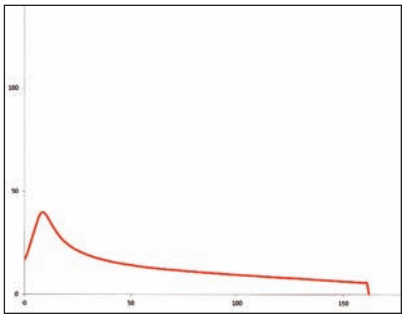
<8.5 % Wheat Protein Range



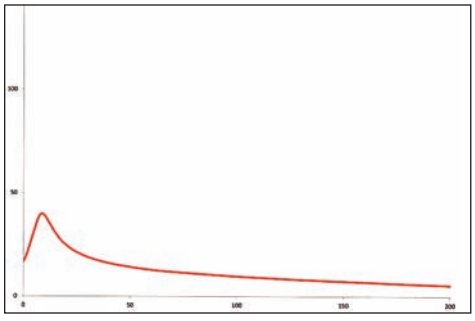
8.5-9.4% Wheat Protein Range



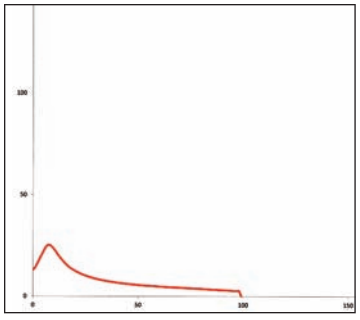
9.5-10.4% Wheat Protein Range



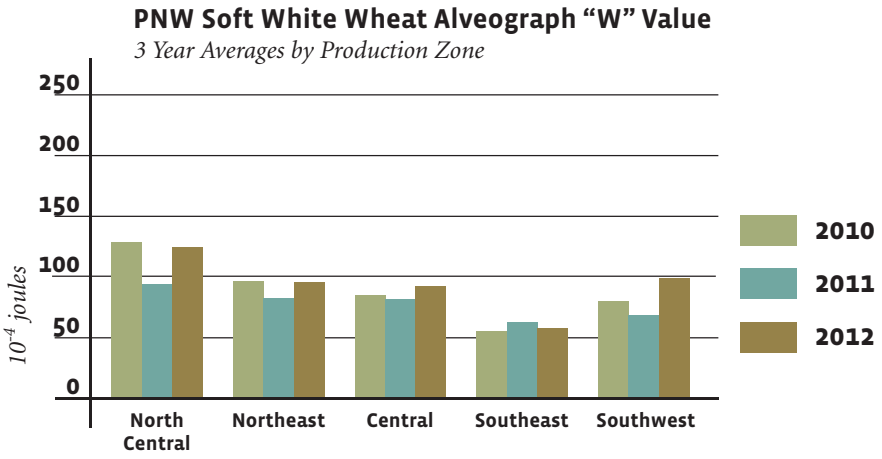
10.5-12.0% Wheat Protein Range

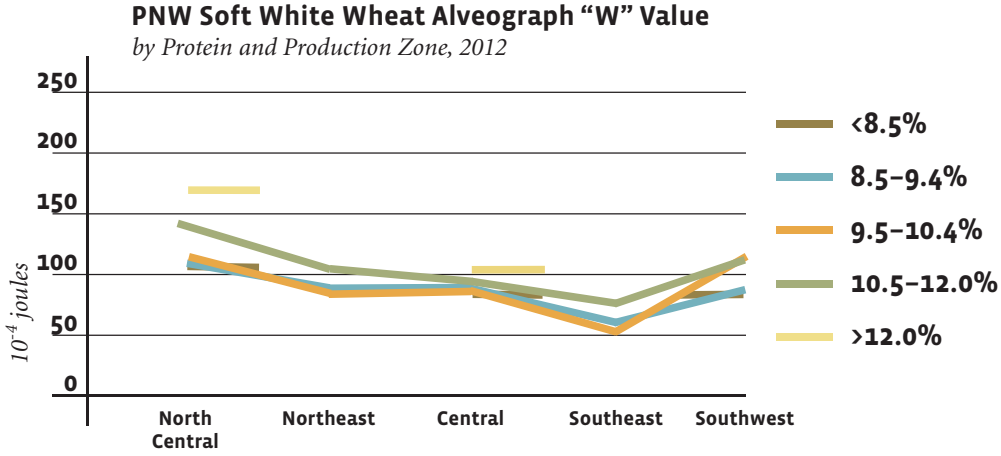


>12.0% Wheat Protein Range

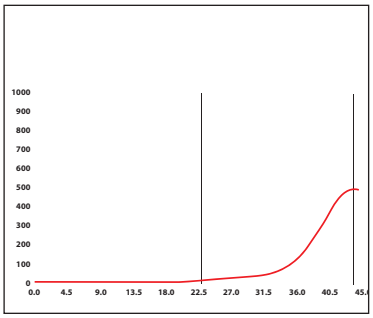


White Club Wheat

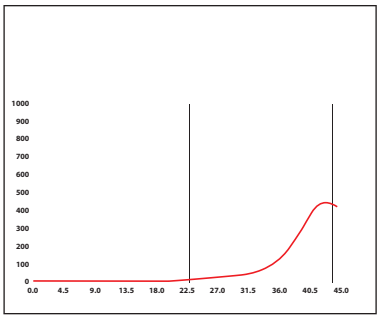




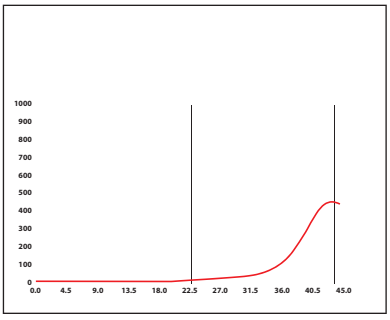
AMYLOGRAPH



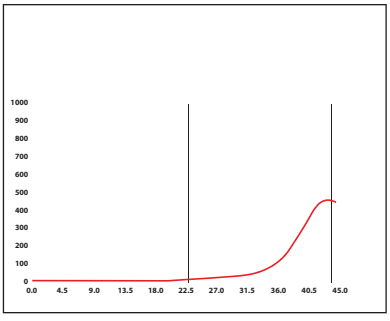
North Central Production Zone



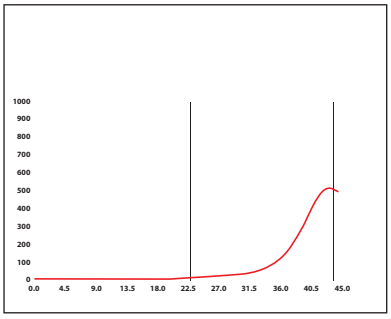
Northeast Production Zone



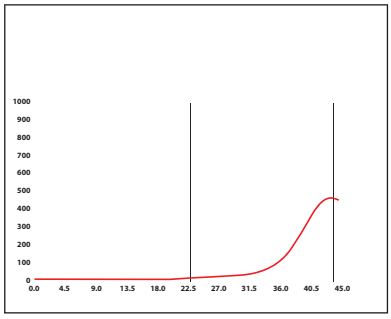
Central Production Zone



Southeast Production Zone



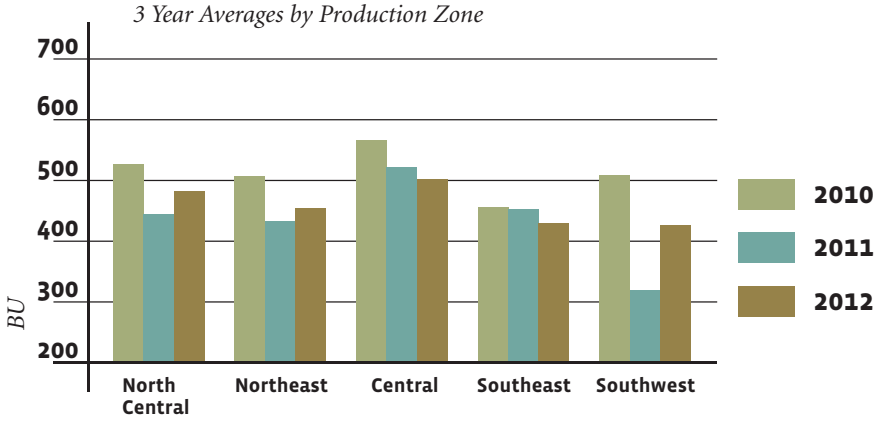
Southwest Production Zone



White Club Wheat

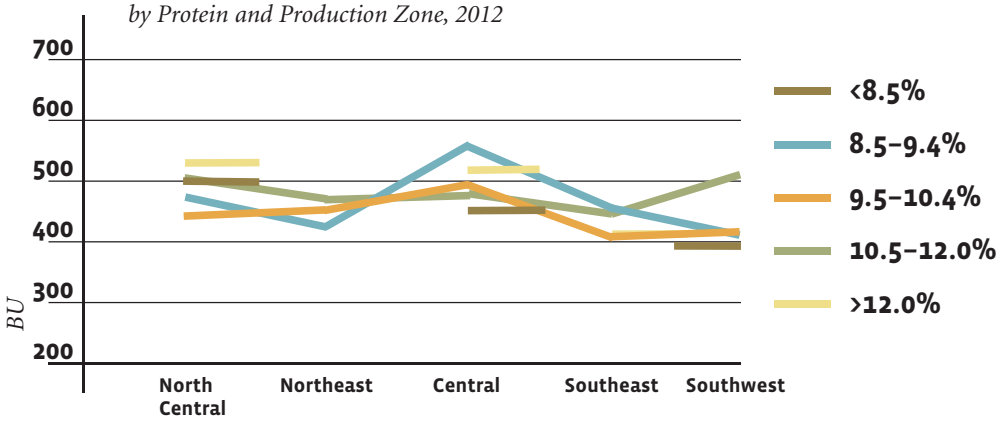
PNW Soft White Wheat Amylograph Peak Viscosity

3 Year Averages by Production Zone



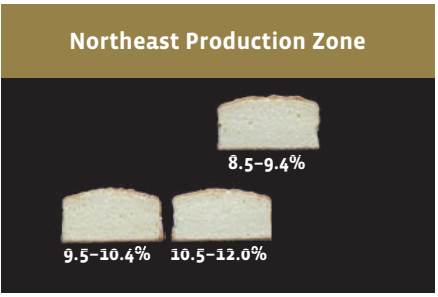
PNW Soft White Wheat Amylograph Peak Viscosity

by Protein and Production Zone, 2012



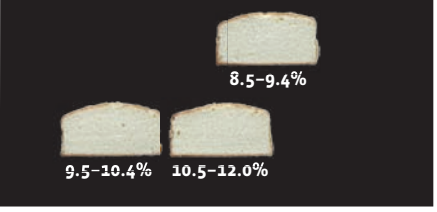
North Central Production Zone

Northeast Production Zone

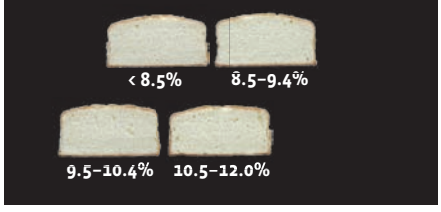


Central Production Zone

Southeast Production Zone



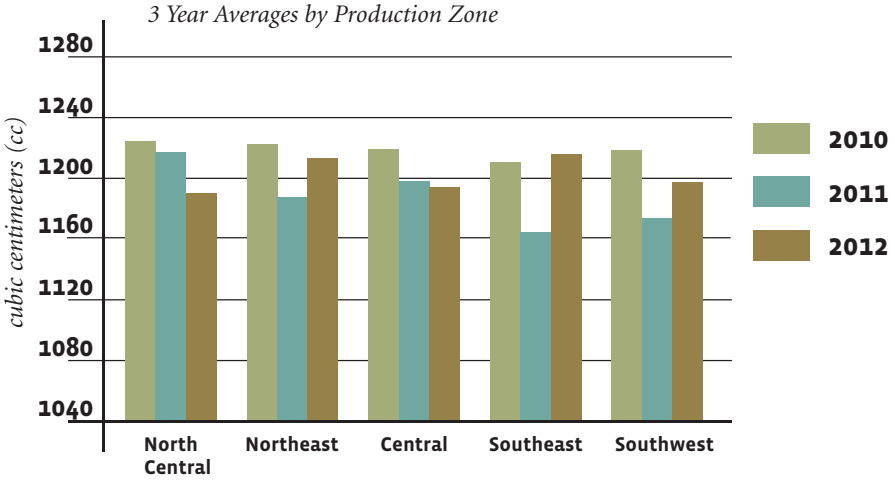
Southwest Production Zone



White Club Wheat

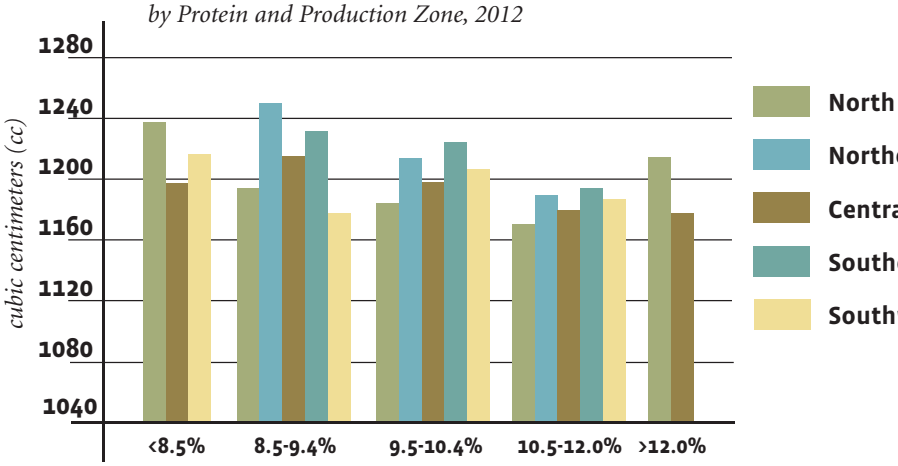
PNW Soft White Wheat Sponge Cake Volume

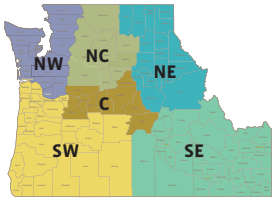
3 Year Averages by Production Zone



PNW Soft White Wheat Sponge Cake Volume

by Protein and Production Zone, 2012





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. One composite sample was prepared from all club wheat samples. These composite samples were analyzed for wheat quality, flour quality, physical dough properties, and finished product characteristics. Harvest information is summarized as follows:

Wheat Quality

Wheat data indicated higher average test weights at most protein levels in most production zones when compared to the three year average. Dockage levels were less than the three year average in soft white wheat production zones. In general, low wheat moisture at less than 10 percent prevailed in the major wheat producing zones of North Central, Northeast, Central, and Southeast. Average falling number values in North Central, Central, and Southeast production zones were greater than 300 seconds at most protein ranges. Wheat ash contents were similar to three year average in the North Central, Northeast, Central, Southeast, and Southwest Production Zones. Wheat samples from North Central, Northeast, Central, and Southeast production zones had thousand kernel weights greater than last year.

Flour Quality

Average flour extraction values were greater than last year at similar flour ash contents. Flour quality parameters indicated higher wet gluten contents in samples with higher protein content. Flour falling number values were greater than 300 seconds at all protein ranges in all production zones. Amylograph peak viscosities above 450 BU were present in most protein ranges in samples from North Central, Northeast, and Central production zones.

Physical Dough Properties

Physical dough property tests indicated low average water absorption values and weak gluten strength, as measured by the farinograph, in samples with lower protein content. Longer extensibility, as shown by alveograph L values, was observed in samples with higher protein content. White club wheat had weaker gluten strength than most soft white wheat samples, as indicated by alveograph W values.

Finished Products

Within a production zone, lower protein samples made better sugar snap cookies. Average sponge cake volumes were higher in the northeast, southeast, and southwest production zones when compared to last year. Steamed bread specific volumes generally increased with increasing protein content.