



U.S. PACIFIC NORTHWEST  
2022 HARVEST  
SOFT WHITE  
WHEAT  
QUALITY REPORT

*Cover photo courtesy of the Oregon Wheat Commission*



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Idaho Wheat Commission | Oregon Wheat Commission | Washington Grain Commission  
U.S. Wheat Associates | Wheat Marketing Center

## PACIFIC NORTHWEST

# EXECUTIVE SUMMARY

The Pacific Northwest (PNW) soft white and club wheat production returned to more normal growing conditions marked by a significant increase in moisture and a long, cool spring for 2022. The result of these conditions is a total estimated production of 6.58 MMT compared to last year's 4.27 MMT and the five-year average of 5.96 MMT. The overall crop graded as #1 for all production zones, and protein contents are lower than last year with soft white below the five-year average and club slightly above the five-year. Average test weight and thousand kernel weight were at or above the five-year average, while kernel hardness was lower. Farinograph, Alveograph, and SRC values all indicate very weak to medium gluten strength appropriate for the production of soft wheat flour products and those made with soft and hard wheat blends. End product tests show better sponge cake volume with improved steam bread and cookie performance over last year. Overall baking quality is consistent with typical performance for soft wheat.



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## CONTENTS

Introduction	1
Soft White Wheat Class & Subclasses	
Summary	
Production Zones	2
Wheat Samples	
Weather & Production	
Wheat Quality	3
Flour Quality	4
Solvent Retention Capacity	5
Physical Dough Properties	6
Finished Products:	
Sponge Cake	8
Sugar Snap Cookie	9
Graphs	10
Steamed Bread	11
Summary	12





# PACIFIC NORTHWEST SOFT WHITE WHEAT CLASS & SUBCLASSES

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

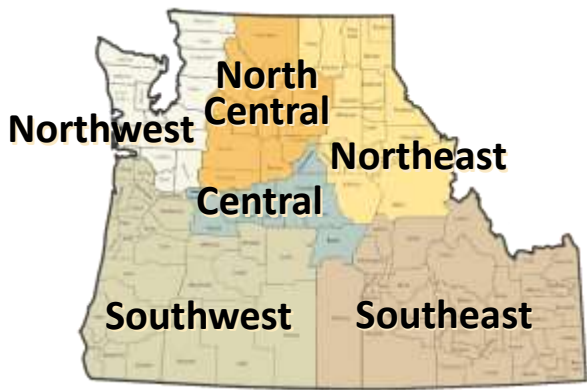
Pacific Northwest soft white wheat is valued for its white bran, low moisture content, and weak gluten characteristics. Consequently, SW is well suited for products such as cakes, cookies, pancakes, and snack foods. Soft white wheat with stronger gluten can be used in crackers, flat breads, and Chinese 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	
	2022	5 Yr Avg	2022	5 Yr Avg
<b>Test Weight</b> (lb/bu)	<b>61.0</b>	61.1	<b>60.6</b>	60.7
<b>Hectoliter Weight</b> (kg/hl)	<b>80.2</b>	<b>80.4</b>	<b>79.7</b>	<b>79.8</b>
<b>Grade</b>	<b>1SWH</b>	1SWH	<b>1WHCB</b>	1WHCB
<b>Dockage</b> (%)	<b>0.5</b>	0.5	<b>0.8</b>	0.6
<b>Whole Kernel Moisture</b> (%)	<b>8.9</b>	9.1	<b>7.8</b>	8.4
<b>Wheat Protein</b> (%; 12% mb)	<b>9.5</b>	10.0	<b>10.1</b>	9.9
<b>Wheat Ash</b> (%; 14% mb)	<b>1.47</b>	1.37	<b>1.36</b>	1.29
<b>1000 Kernel Weight</b> (g; 14% mb)	<b>34.8</b>	34.6	<b>30.2</b>	31.1
<b>Wheat Falling Number</b> (seconds; 14% mb)	<b>340</b>	325	<b>356</b>	329
<b>Flour Extraction</b> (%)	<b>71.7</b>	72.2	<b>72.9</b>	74.1
<b>Flour Ash</b> (%; 14% mb)	<b>0.40</b>	0.43	<b>0.43</b>	0.44
<b>Flour Wet Gluten</b> (%; 14% mb)	<b>19.9</b>	22.9	<b>14.5</b>	15.5
<b>Farinograph: Absorption</b> (%; 14% mb)	<b>50.8</b>	52.1	<b>50.0</b>	50.0
<b>Peak Time</b> (minutes)	<b>1.4</b>	2.1	<b>1.1</b>	1.3
<b>Stability Time</b> (minutes)	<b>2.0</b>	2.6	<b>1.1</b>	1.3
<b>Alveograph: L</b> (mm)	<b>75</b>	100	<b>49</b>	76
<b>W</b> (10 <sup>-4</sup> joules)	<b>79</b>	84	<b>33</b>	35
<b>Production</b> (mmt)	<b>6.28</b>	5.64	<b>0.30</b>	0.32



*Photo courtesy of Washington Grain Commission*



**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 throughout the Pacific Northwest. Sample collection was based on wheat production in each location. For the 2022 harvest, Wheat Marketing Center (WMC) received and tested 404 SW and 53 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, Norwest Tandem, Norwest Duet, Mpress, LCS Shine, and Ryan. Oregon’s top SW varieties were UI Magic CL+, SY Assure, LCS Shine and Rosalyn. Idaho’s top SW winter varieties were SY Ovation, Brundage, and LCS Shine. The top SW spring variety was Ryan. Castella and Pritchett were the top white club varieties planted in the PNW.

2022 SOFT WHITE AND WHITE CLUB WHEAT PRODUCTION		
Production Zone	Million Metric Tons (mmt)	Million Bushels
North Central	1.68	61.6
Northeast	2.24	82.2
Central	1.38	50.7
Southeast	0.95	35.0
Southwest	0.3	10.9
Northwest	0.03	1.2
<b>Total</b>	<b>6.58</b>	<b>241.6</b>

Source: USDA Small Grains Summary, NASS 9/30/22, and Washington Grain Commission 10/4/22.



*Photo courtesy of Oregon Wheat Commission*



*Photo courtesy of Washington Grain Commission*

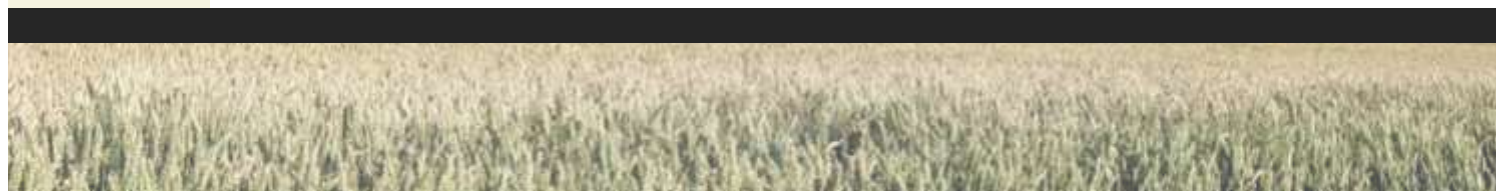
## Weather & Production

Across the Pacific Northwest (PNW), drought conditions impacting the 2021 harvest continued through fall planting, with many areas delaying seeding. Soil moisture through the winter months and early spring remained average to low across the region. While soil moisture remained low in parts of the region, timely rains in the spring months of April and May provided much needed moisture across the region. Temperatures remained cool through the late spring further supporting crop development. Harvest was delayed 10 – 14 days later than average as a result. Moderate temperatures as the crop matured through the summer supported good kernel sizes and lower proteins than last year. USDA estimates the total PNW SW production at 6.58 MMT, which is greater than the five-year average. Of that, white club (WC) is estimated to account for 0.3 MMT.



# 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	60.9	0.4	8.5	313	1.38	35.9	26	10.5
	8.5-9.4	1SWH	61.0	0.4	8.3	346	1.42	35.2	28	19.9
	9.5-10.4	1SWH	60.8	0.6	8.4	354	1.37	33.6	30	23.0
	10.5-12.0	1SWH	61.0	0.5	8.2	367	1.40	33.7	33	27.4
	>12.0	1SWH	60.6	0.5	8.1	399	1.35	34.0	34	30.6
	<b>2022 Average</b>	<b>1SWH</b>	<b>60.9</b>	<b>0.5</b>	<b>8.3</b>	<b>353</b>	<b>1.38</b>	<b>34.4</b>	<b>30</b>	<b>22.0</b>
	2021 Average	2SWH	59.5	0.3	7.8	355	1.31	28.0	39	27.7
	5 Year Average	1SWH	61.2	0.4	8.6	330	1.28	33.4	30	24.1
Northeast	<8.5	1SWH	61.0	0.5	8.9	340	1.46	33.6	28	13.0
	8.5-9.4	1SWH	61.7	0.4	9.4	345	1.48	36.5	28	17.3
	9.5-10.4	1SWH	61.6	0.3	9.1	365	1.45	35.9	30	23.3
	10.5-12.0	2SWH	59.9	0.6	9.0	370	1.50	31.8	32	26.5
	<b>2022 Average</b>	<b>1SWH</b>	<b>61.2</b>	<b>0.4</b>	<b>9.2</b>	<b>353</b>	<b>1.47</b>	<b>35.0</b>	<b>29</b>	<b>19.6</b>
	2021 Average	2SWH	58.7	0.7	9.0	346	1.47	25.0	30	28.8
	5 Year Average	1SWH	61.7	0.5	9.2	333	1.37	34.4	29	22.6
Central	<8.5	1SWH	61.5	0.5	8.6	327	1.44	35.0	26	13.6
	8.5-9.4	1SWH	61.7	0.7	8.7	339	1.45	34.7	29	18.9
	9.5-10.4	1SWH	61.6	0.6	9.1	345	1.49	35.7	27	21.9
	10.5-12.0	1SWH	61.9	0.6	8.6	321	1.51	36.0	31	26.2
	<b>2022 Average</b>	<b>1SWH</b>	<b>61.6</b>	<b>0.6</b>	<b>8.7</b>	<b>333</b>	<b>1.45</b>	<b>35.1</b>	<b>27</b>	<b>17.1</b>
	2021 Average	2SWH	59.5	0.5	8.6	350	1.43	28.1	35	27.1
Southeast	<8.5	1SWH	60.7	0.5	8.8	317	1.57	40.8	20	13.4
	8.5-9.4	1SWH	60.2	0.4	9.8	316	1.57	37.2	22	18.8
	9.5-10.4	1SWH	60.8	0.2	9.4	319	1.60	36.2	24	21.7
	10.5-12.0	2SWH	59.3	0.6	10.0	334	1.63	32.5	29	27.2
	<b>2022 Average</b>	<b>1SWH</b>	<b>60.2</b>	<b>0.4</b>	<b>9.6</b>	<b>322</b>	<b>1.60</b>	<b>35.8</b>	<b>24</b>	<b>21.8</b>
	2021 Average	2SWH	59.4	0.6	10.0	329	1.66	35.3	21	20.9
	5 Year Average	1SWH	60.4	0.5	10.0	329	1.53	38.1	27	20.5
	Southwest	<9.5	1SWH	60.2	0.8	11.6	345	1.52	33.0	26
<b>2022 Average</b>		<b>1SWH</b>	<b>60.2</b>	<b>0.8</b>	<b>11.6</b>	<b>345</b>	<b>1.52</b>	<b>33.0</b>	<b>26</b>	<b>19.5</b>
2021 Average		1SWH	61.4	0.5	10.5	333	1.43	37.0	33	18.6
5 Year Average		2SWH	60.2	0.5	10.7	326	1.40	38.6	25	18.3
White Club Wheat	<b>2022 Average</b>	<b>1WHCB</b>	<b>60.6</b>	<b>0.8</b>	<b>7.8</b>	<b>356</b>	<b>1.36</b>	<b>30.2</b>	<b>31</b>	<b>24.1</b>
	2021 Average	1WHCB	59.7	0.5	8.0	345	1.32	32.3	36	25.9
	5 Year Average	1WHCB	60.7	0.6	8.4	329	1.29	32.2	29	19.7





# 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	72.1	0.44	7.0	93.5	-2.3	8.3	18.9	373	584
	8.5-9.4	73.7	0.42	8.3	93.7	-2.3	8.3	18.6	373	596
	9.5-10.4	72.4	0.44	9.3	93.5	-2.2	8.2	26.5	359	571
	10.5-12.0	72.7	0.47	10.2	93.3	-2.0	7.8	24.6	395	608
	>12.0	71.3	0.53	11.4	93.0	-1.7	7.0	32.4	414	670
	<b>2022 Average</b>	<b>72.5</b>	<b>0.45</b>	<b>9.2</b>	<b>93.4</b>	<b>-2.1</b>	<b>8.0</b>	<b>23.9</b>	<b>379</b>	<b>598</b>
	2021 Average	68.3	0.46	11.0	92.6	-2.2	8.8	29.6	398	574
5 Year Average	71.8	0.42	9.2	92.7	-2.2	8.5	23.2	358	505	
Northeast	<8.5	73.2	0.43	7.0	93.3	-2.3	8.1	12.6	353	575
	8.5-9.4	75.2	0.46	7.9	93.3	-2.2	8.2	13.3	353	552
	9.5-10.4	73.8	0.42	9.0	93.0	-2.2	8.0	24.1	344	560
	10.5-12.0	72.1	0.45	10.2	92.9	-2.1	7.9	28.2	394	629
	<b>2022 Average</b>	<b>74.0</b>	<b>0.44</b>	<b>8.4</b>	<b>93.1</b>	<b>-2.2</b>	<b>8.1</b>	<b>18.3</b>	<b>359</b>	<b>573</b>
	2021 Average	68.7	0.48	10.7	92.9	-2.0	8.2	25.7	383	603
	5 Year Average	73.0	0.43	8.7	92.6	-2.1	8.4	21.2	359	505
Central	<8.5	72.2	0.42	6.9	93.4	-2.1	7.4	11.1	357	537
	8.5-9.4	73.2	0.43	8.0	93.5	-2.1	7.4	15.6	374	550
	9.5-10.4	72.6	0.43	8.9	93.1	-1.9	7.0	24.0	374	568
	10.5-12.0	74.4	0.43	9.8	93.0	-1.8	6.8	23.8	342	407
	<b>2022 Average</b>	<b>72.7</b>	<b>0.42</b>	<b>7.7</b>	<b>93.4</b>	<b>-2.1</b>	<b>7.3</b>	<b>15.1</b>	<b>364</b>	<b>541</b>
	2021 Average	69.0	0.48	10.2	92.7	-2.1	8.4	25.9	388	556
	5 Year Average	72.1	0.43	8.9	92.7	-2.1	8.2	23.3	353	517
Southeast	<8.5	73.1	0.50	7.0	93.6	-2.1	7.5	10.1	386	513
	8.5-9.4	72.6	0.45	7.9	93.2	-2.2	7.8	14.5	362	479
	9.5-10.4	73.2	0.47	9.0	93.4	-2.1	7.8	19.4	354	541
	10.5-12.0	71.2	0.48	10.3	93.3	-2.1	7.9	20.7	376	564
	<b>2022 Average</b>	<b>72.4</b>	<b>0.47</b>	<b>8.9</b>	<b>93.3</b>	<b>-2.1</b>	<b>7.8</b>	<b>17.6</b>	<b>365</b>	<b>527</b>
	2021 Average	71.9	0.49	9.5	92.6	-2.0	7.8	20.2	348	473
	5 Year Average	73.6	0.48	8.8	92.6	-2.0	7.9	20.6	343	452
Southwest	<9.5	72.3	0.47	8.0	92.5	-2.1	7.5	22.9	343	499
	<b>2022 Average</b>	<b>72.3</b>	<b>0.47</b>	<b>8.0</b>	<b>92.5</b>	<b>-2.1</b>	<b>7.5</b>	<b>22.9</b>	<b>343</b>	<b>499</b>
	2021 Average	73.4	0.45	8.1	92.7	-2.4	9.7	15.8	344	452
	5 Year Average	73.5	0.49	7.5	92.3	-2.2	8.6	16.8	340	419
White Club Wheat	<b>2022 Average</b>	<b>72.9</b>	<b>0.43</b>	<b>9.0</b>	<b>93.4</b>	<b>-2.0</b>	<b>7.1</b>	<b>14.5</b>	<b>378</b>	<b>580</b>
	2021 Average	72.0	0.42	10.5	92.9	-1.9	8.1	6.1	387	472
	5 Year Average	74.1	0.44	8.9	92.5	-2.1	8.2	15.9	361	479



# 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	57	101	92	72	0.53
	8.5-9.4	54	99	86	73	0.50
	9.5-10.4	55	103	103	73	0.59
	10.5-12.0	56	100	108	72	0.63
	>12.0	58	103	111	69	0.65
	<b>2022 Average</b>	<b>56</b>	<b>101</b>	<b>100</b>	<b>72</b>	<b>0.58</b>
	2021 Average	53	92	123	66	0.78
	5 Year Average	54	91	91	117	73
Northeast	<8.5	55	99	85	72	0.50
	8.5-9.4	53	96	90	69	0.55
	9.5-10.4	52	92	96	67	0.60
	10.5-12.0	51	97	70	69	0.42
	<b>2022 Average</b>	<b>53</b>	<b>96</b>	<b>86</b>	<b>69</b>	<b>0.53</b>
	2021 Average	49	94	110	64	0.70
	5 Year Average	53	88	88	103	72
Central	<8.5	53	96	88	70	0.53
	8.5-9.4	53	92	88	72	0.54
	9.5-10.4	52	92	84	64	0.54
	10.5-12.0	52	89	85	61	0.57
	<b>2022 Average</b>	<b>53</b>	<b>94</b>	<b>87</b>	<b>69</b>	<b>0.54</b>
	2021 Average	51	96	112	66	0.69
	5 Year Average	54	89	89	106	72
Southeast	<8.5	54	94	76	72	0.46
	8.5-9.4	53	92	71	65	0.45
	9.5-10.4	46	93	78	66	0.49
	10.5-12.0	57	100	88	65	0.53
	<b>2022 Average</b>	<b>52</b>	<b>95</b>	<b>78</b>	<b>66</b>	<b>0.49</b>
	2021 Average	49	92	81	65	0.52
	5 Year Average	52	88	83	70	0.53
Southwest	<9.5	56	100	91	76	0.52
	<b>2022 Average</b>	<b>56</b>	<b>100</b>	<b>91</b>	<b>76</b>	<b>0.52</b>
	2021 Average	54	97	95	72	0.56
	5 Year Average	55	92	97	75	0.58
White Club Wheat	<b>2022 Average</b>	<b>55</b>	<b>93</b>	<b>71</b>	<b>67</b>	<b>0.44</b>
	2021 Average	49	86	75	63	0.51
	5 Year Average	52	90	77	73	0.47

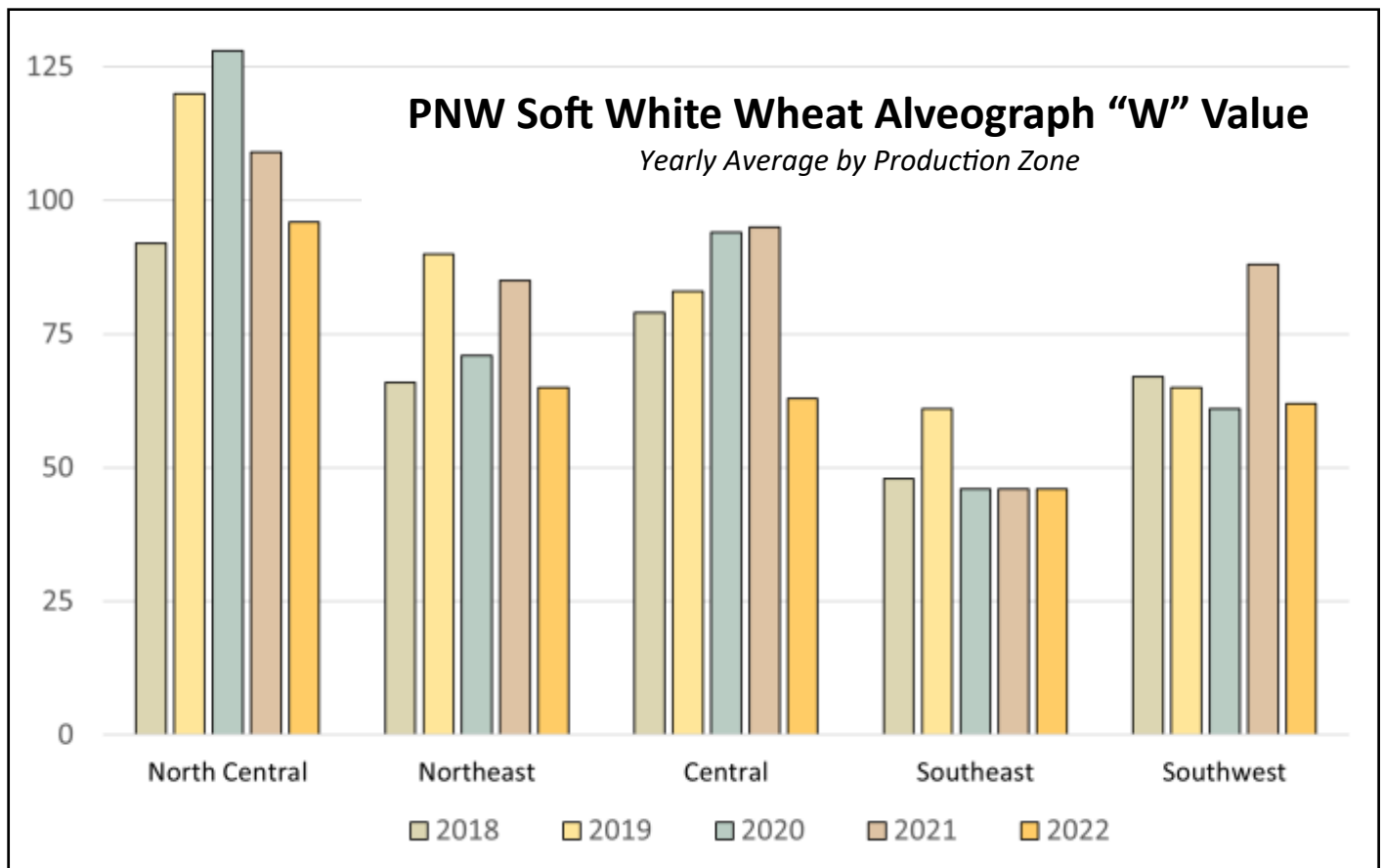
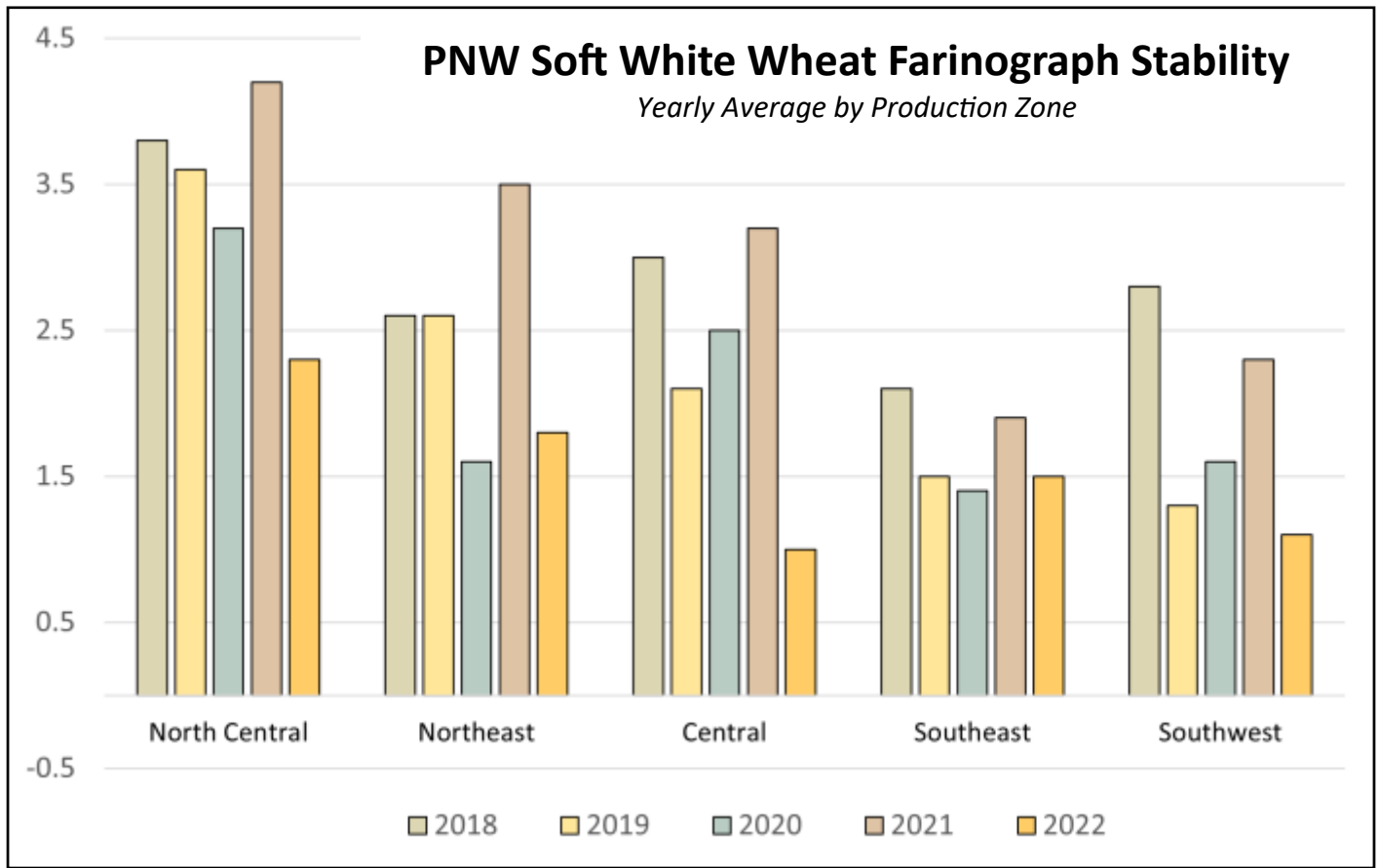


# PHYSICAL DOUGH PROPERTIES

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 <sup>-4</sup> J
North Central	<8.5	52.2	1.1	1.1	49	62	0.79	95
	8.5-9.4	51.5	1.2	1.4	38	92	0.41	87
	9.5-10.4	52.1	1.4	3.1	40	111	0.36	103
	10.5-12.0	53.2	2.4	3.0	39	104	0.38	94
	>12.0	55.0	2.2	2.3	46	94	0.49	101
	<b>2022 Average</b>	<b>52.6</b>	<b>1.6</b>	<b>2.3</b>	<b>42</b>	<b>95</b>	<b>0.47</b>	<b>96</b>
	2021 Average	53.5	2.7	4.2	47	90	0.53	109
	5 Year Average	52.2	2.4	3.8	42	110	0.42	113
Northeast	<8.5	49.7	1.1	1.1	34	58	0.59	56
	8.5-9.4	51.0	1.1	1.2	35	66	0.53	60
	9.5-10.4	51.7	1.3	2.2	37	78	0.47	73
	10.5-12.0	52.7	1.6	3.1	37	72	0.51	75
	<b>2022 Average</b>	<b>51.3</b>	<b>1.2</b>	<b>1.8</b>	<b>36</b>	<b>68</b>	<b>0.53</b>	<b>65</b>
	2021 Average	52.2	2.3	3.5	37	87	0.43	85
	5 Year Average	51.9	1.8	2.7	36	92	0.42	80
	Central	<8.5	50.0	1.1	0.6	32	66	0.48
8.5-9.4		50.6	1.2	1.4	31	73	0.42	62
9.5-10.4		51.2	1.2	1.3	32	100	0.32	76
10.5-12.0		52.8	1.3	2.1	32	61	0.52	51
<b>2022 Average</b>		<b>50.5</b>	<b>1.2</b>	<b>1.0</b>	<b>32</b>	<b>73</b>	<b>0.44</b>	<b>63</b>
2021 Average		52.5	2.1	3.2	42	85	0.50	95
5 Year Average		51.4	1.8	2.6	35	106	0.37	87
Southeast		<8.5	51.0	1.2	1.1	34	48	0.71
	8.5-9.4	50.8	1.1	1.1	31	43	0.72	40
	9.5-10.4	51.5	1.1	1.5	31	49	0.63	42
	10.5-12.0	52.6	2.3	2.2	34	68	0.50	58
	<b>2022 Average</b>	<b>51.6</b>	<b>1.5</b>	<b>1.5</b>	<b>32</b>	<b>53</b>	<b>0.63</b>	<b>46</b>
	2021 Average	51.3	1.2	1.9	30	62	0.50	46
	5 Year Average	51.5	1.5	1.7	29	91	0.36	53
	Southwest	<9.5	51.3	1.2	1.1	31	88	0.35
<b>2022 Average</b>		<b>51.3</b>	<b>1.2</b>	<b>1.1</b>	<b>31</b>	<b>88</b>	<b>0.35</b>	<b>62</b>
2021 Average		51.9	1.3	2.3	47	75	0.65	88
5 Year Average		50.9	1.4	2.0	35	87	0.44	72
White Club Wheat		<b>2022 Average</b>	<b>50.0</b>	<b>1.1</b>	<b>1.1</b>	<b>25</b>	<b>49</b>	<b>0.51</b>
	2021 Average	51.1	1.2	1.1	27	43	0.63	29
	5 Year Average	50.0	1.3	1.3	24	75	0.37	36



# PHYSICAL DOUGH PROPERTIES





# FINISHED PRODUCTS: SPONGE CAKE

Production Zone	Wheat Protein Range	Sponge Cake	
	12% mb %	Volume cc	Total Score (Control is 56)
North Central	<8.5	1163	57
	8.5-9.4	1136	56
	9.5-10.4	1124	55
	10.5-12.0	1093	51
	>12.0	1045	36
	<b>2022 Average</b>	<b>1117</b>	<b>52</b>
	2021 Average	1073	35
5 Year Average	1107	43	
Northeast	<8.5	1181	59
	8.5-9.4	1145	54
	9.5-10.4	1121	54
	10.5-12.0	1126	56
	<b>2022 Average</b>	<b>1143</b>	<b>55</b>
	2021 Average	1102	33
Central	<8.5	1176	59
	8.5-9.4	1115	54
	9.5-10.4	1096	54
	10.5-12.0	1080	57
	<b>2022 Average</b>	<b>1140</b>	<b>57</b>
2021 Average	1079	38	
5 Year Average	1112	46	
Southeast	<8.5	1194	62
	8.5-9.4	1116	55
	9.5-10.4	1081	53
	10.5-12.0	1034	50
	<b>2022 Average</b>	<b>1087</b>	<b>53</b>
	2021 Average	1112	46
Southwest	<9.5	1118	54
	<b>2022 Average</b>	<b>1118</b>	<b>54</b>
	2021 Average	1086	40
	5 Year Average	1141	51
White Club Wheat	<b>2022 Average</b>	<b>1150</b>	<b>56</b>
	2021 Average	1070	34
	5 Year Average	1126	47

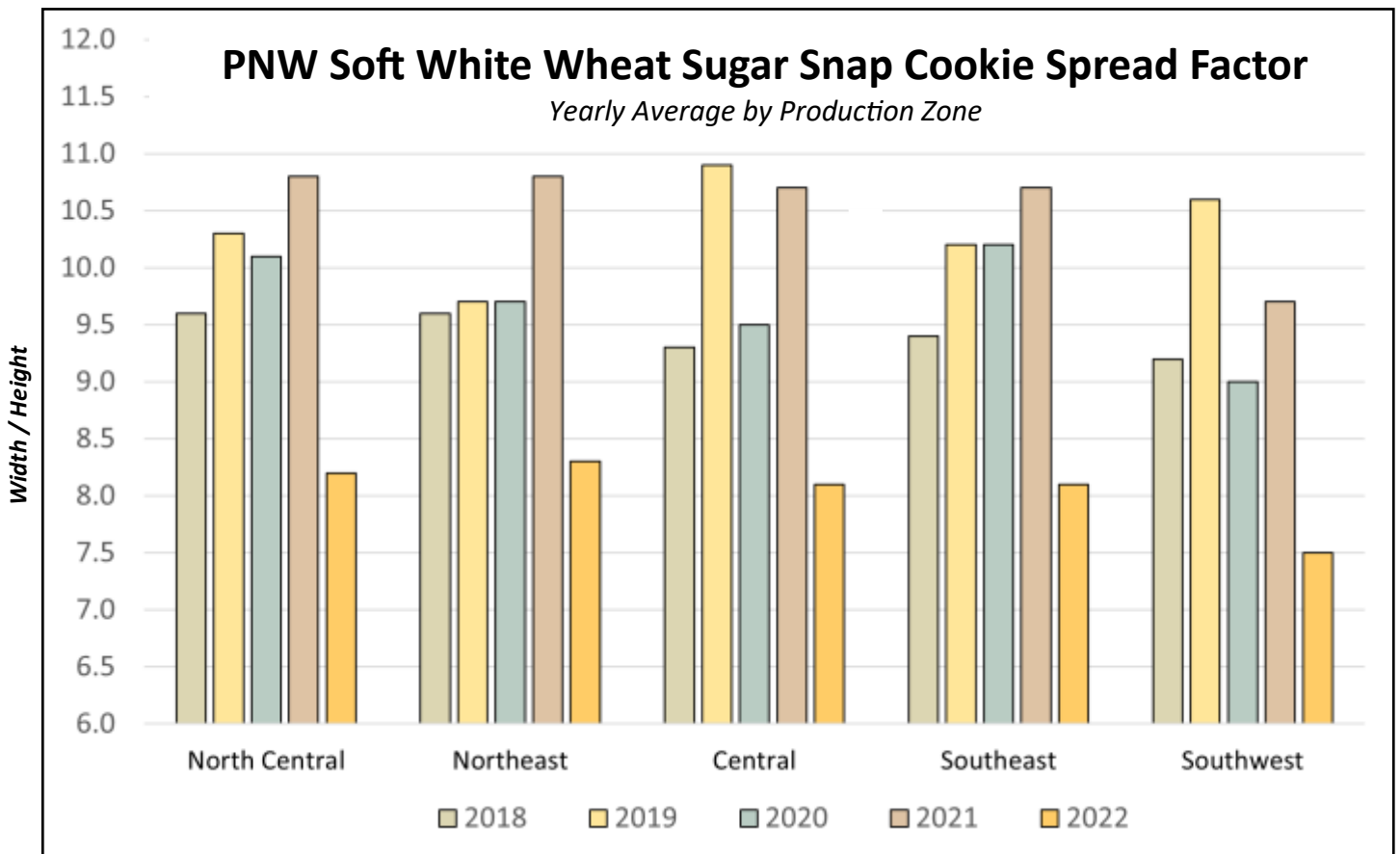
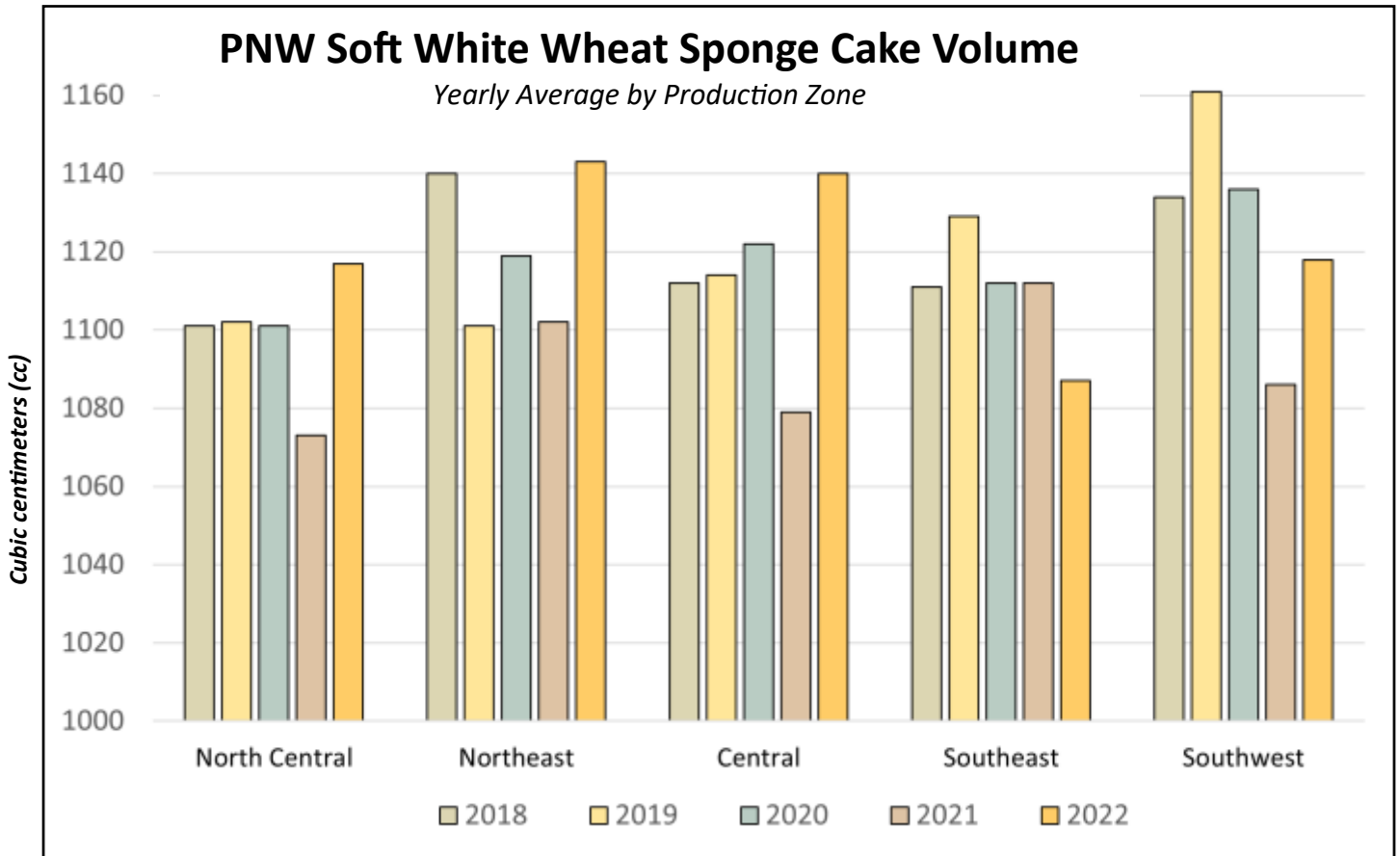


# FINISHED PRODUCTS: SUGAR SNAP COOKIE

Production Zone	Wheat Protein Range	Sugar Snap Cookie		
	12% mb %	Spread cm	Spread Factor width height	Top Grain Score
North Central	<8.5	8.3	8.7	5.0
	8.5-9.4	8.3	8.5	5.5
	9.5-10.4	8.2	8.2	4.0
	10.5-12.0	8.1	7.7	4.5
	>12.0	8.1	7.9	3.0
	<b>2022 Average</b>	<b>8.2</b>	<b>8.2</b>	<b>4.5</b>
	2021 Average	8.7	10.8	2.5
5 Year Average	8.8	10.2	4.3	
Northeast	<8.5	8.4	8.0	4.0
	8.5-9.4	8.2	8.6	4.0
	9.5-10.4	8.3	8.1	4.0
	10.5-12.0	8.2	8.4	4.0
	<b>2022 Average</b>	<b>8.2</b>	<b>8.3</b>	<b>4.0</b>
2021 Average	8.7	10.8	3.6	
5 Year Average	8.8	10.0	4.3	
Central	<8.5	8.4	8.2	4.0
	8.5-9.4	8.2	8.2	3.5
	9.5-10.4	8.2	7.8	4.0
	10.5-12.0	8.2	7.4	4.0
	<b>2022 Average</b>	<b>8.3</b>	<b>8.1</b>	<b>3.8</b>
2021 Average	8.7	10.7	3.7	
5 Year Average	8.8	10.1	4.6	
Southeast	<8.5	8.2	8.2	5.0
	8.5-9.4	8.4	8.0	4.0
	9.5-10.4	8.3	8.3	4.5
	10.5-12.0	8.3	7.9	2.0
	<b>2022 Average</b>	<b>8.3</b>	<b>8.1</b>	<b>3.7</b>
2021 Average	8.8	10.7	4.4	
5 Year Average	9.0	10.3	4.6	
Southwest	<9.5	8.1	7.5	4.0
	<b>2022 Average</b>	<b>8.1</b>	<b>7.5</b>	<b>4.0</b>
	2021 Average	8.6	9.7	3.5
	5 Year Average	8.8	9.7	4.4
White Club Wheat	<b>2022 Average</b>	<b>8.7</b>	<b>9.9</b>	<b>5.0</b>
	2021 Average	9.1	12.7	4.0
	5 Year Average	9.3	11.9	5.6



# FINISHED PRODUCTS





# FINISHED PRODUCTS: STEAMED BREAD

Production Zone	Wheat Protein Range	Chinese Southern Type Steamed Bread		
	12% mb %	Specific Volume cc/g	Total Score (Control is	
North Central	<8.5	2.44	67	
	8.5-9.4	2.46	67	
	9.5-10.4	2.63	71	
	10.5-12.0	2.80	73	
	>12.0	2.97	72	
	<b>2022 Average</b>	<b>2.64</b>	<b>70</b>	
	2021 Average	2.26	61	
	5 Year Average	1.99	66	
	Northeast	<8.5	2.39	64
		8.5-9.4	2.56	68
9.5-10.4		2.55	69	
10.5-12.0		2.64	71	
<b>2022 Average</b>		<b>2.54</b>	<b>68</b>	
2021 Average	2.48	63		
5 Year Average	2.08	66		
Central	<8.5	2.32	70	
	8.5-9.4	2.38	71	
	9.5-10.4	2.49	72	
	10.5-12.0	2.64	73	
	<b>2022 Average</b>	<b>2.38</b>	<b>70</b>	
2021 Average	2.36	62		
5 Year Average	2.08	66		
Southeast	<8.5	2.25	70	
	8.5-9.4	2.36	71	
	9.5-10.4	2.54	71	
	10.5-12.0	2.62	72	
	<b>2022 Average</b>	<b>2.49</b>	<b>71</b>	
2021 Average	2.21	53		
5 Year Average	2.03	63		
Southwest	<9.5	2.52	69	
	<b>2022 Average</b>	<b>2.52</b>	<b>69</b>	
	2021 Average	2.17	56	
White Club Wheat	5 Year Average	1.92	64	
	<b>2022 Average</b>	<b>2.86</b>	<b>69</b>	
	2021 Average	2.27	53	
5 Year Average	2.15	62		

# SUMMARY

These results were derived from composite samples from the 2022 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  $\geq 60.2$  pounds per bushel (lbs/bu) across all production zones except for the 10.5 – 12.0% protein composites in the Northeast and Southeast production zones, which have test weights of 59.9 and 59.3 lbs/bu, respectively.
- ◆ WC test weight is 60.6 lbs/bu.

### Wheat Moisture

- ◆ SW wheat weighted average moistures are 10% or lower except for the Southwest zone, which has an average wheat moisture of 11.6%.
- ◆ WC wheat moisture is 7.8%.

### Falling Number

- ◆ SW falling number values are  $\geq 313$  sec in all production zones.
- ◆ WC falling number is 356 sec.

### Wheat Ash

- ◆ SW wheat ash weighted averages are between 1.35% to 1.63% (14% mb).
- ◆ WC wheat ash average is 1.36% (14% mb).

### Thousand Kernel Weight (TKW)

- ◆ SW TKW ranges from 31.8 g to 40.8 g across the production zones.
- ◆ WC TKW is 30.2 g.

### SKCS Kernel Hardness Index

- ◆ SW SKCS hardness weighted averages range from 20 to 34 with lower values for lower protein composites across all production zones.
- ◆ WC SKCS hardness average is 31.

### Whole Meal Wet Gluten

- ◆ SW weighted average whole meal wet gluten is 10.5% to 30.6%, with the lower values coming from lower protein composites across all production zones.
- ◆ WC whole meal wet gluten is 24.1%.

## Flour Quality

### Flour Yields

- ◆ SW flour yields exceed 71% for all protein composites in all production zones. Weighted average flour yields range from 71.2% to 75.2%.
- ◆ WC flour yield is 72.9%.

### Flour Ash

- ◆ SW straight grade flour ash weighted average values are  $\leq 0.50\%$  (14% mb) for all protein composites across all production zones except for the North Central  $> 12.0\%$  protein composite, which had a flour ash of 0.53% (14% mb).
- ◆ WC straight grade flour ash is 0.43% (14% mb).

### Flour Color

- ◆ SW flour L\* (whiteness) values exceed 92.0 across all protein composites and production zones. Weighted average values range from 92.5 to 93.7.
- ◆ WC flour L\* is 93.4.

### Wet Gluten

- ◆ SW wet gluten ranges from 10.1% to 32.4% with 2022 weighted averages of  $\geq 15.1\%$  across all production zones. These values are typical for samples with very weak to medium gluten strength.
- ◆ WC wet gluten is 14.5%, indicating weak gluten strength.

### Flour Falling Number

- ◆ SW flour falling number weighted average values are all  $\geq 342$  sec.
- ◆ WC flour falling number is 378 sec.

### Amylograph

- ◆ SW Amylograph peak viscosity weighted averages are all  $\geq 407$  BU.
- ◆ WC Amylograph peak viscosity is 580 BU.



## Solvent Retention Capacity (SRC)

### Water SRC

- ◆ SW water SRC values are < 58% for all protein composites across all production zones. Most protein composites are below 55% with the exception of some composites in the North Central (< 8.5% and > 12.0% composites), Southeast (10.5 – 12.0% composite), and Southwest (< 9.5% composite) zones.
- ◆ WC water SRC is 55%.

### Sucrose SRC

- ◆ SW sucrose SRC values are ≤ 100% for all protein composites in all production zones. The exception is the North Central production zone with < 8.5%, 9.5 – 10.4%, and > 12.0% composites of 101%, 103%, and 103%, respectively.
- ◆ WC sucrose SRC is 93%.

### Lactic Acid SRC

- ◆ SW lactic acid SRC weighted averages range from 70% to 111%. These values are typical for very weak to medium gluten strength.
- ◆ WC lactic acid SRC is 71%, indicative of very weak gluten.

### Sodium Carbonate SRC

- ◆ SW sodium carbonate SRC weighted average values are ≤ 76% for all protein composites in all production zones.
- ◆ WC sodium carbonate SRC is 67%.

### Gluten Performance Index (GPI)

- ◆ SW GPI weighted averages range from 0.46 to 0.65. This is in line with the lactic acid SRC results and indicates that gluten strength is very weak to medium.
- ◆ WC GPI is 0.44, which is typical for very weak gluten.

## Physical Dough Properties

### Farinograph

- ◆ SW Farinograph water absorption values are ≤ 55.0% for all protein composites across all production zones with weighted average peak times and stabilities of ≤ 2.4 min and ≤ 3.1 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 50.0% with a peak time of 1.1 min and a stability of 1.1 min.

### Alveograph

- ◆ SW Alveograph P value weighted averages range from 31 mm to 49 mm with L value weighted averages of 43 mm to 111 mm and P/L ratio averages of 0.32 to 0.679. W value weighted averages range from 40 (10<sup>-4</sup> J) to 103 (10<sup>-4</sup> J). These values align with Farinograph data for gluten strength ranging from very weak to medium.
- ◆ WC Alveograph P, L, P/L and W values are 25 mm, 49 mm, 0.51 and 33 (10<sup>-4</sup> J), respectively. These values are typical for very weak gluten strength.

## Finished Products

### Sponge Cake

SW sponge cake volume weighted averages are over 1087 cc in all production zones with total scores ≥ 52. The majority of scores for individual protein composites from each production zone are ≥ 50. 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. The control this year is from the 2021 harvest year with firmer cake texture than typical, which resulted in better texture scores for most cakes.

WC sponge cake volume is 1150 cc with a total score of 56.

### Sugar Snap Cookies

SW cookie diameter weighted averages range from 8.1 cm to 8.2 cm, with spread factors of 7.5 to 8.3 and top grain scores of 3.7 to 4.5. All composites show fair cookie quality.

WC has an average cookie diameter of 8.7 cm with a spread factor of 9.9 and a top grain score of 5.0. These values are indicative of acceptable cookie quality.

### Steamed Bread

SW steamed bread specific volume weighted averages are 2.38 g/cc or greater in all production zones with total scores ranging from 68 to 71. Scores of 60 or higher from Buhler laboratory mill straight grade flour are acceptable relative to a control score of 70.

WC steamed bread specific volume is 2.86 g/cc with a total score of 69.

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

Photo courtesy of  
Idaho Wheat Commission



Wheat Marketing Center thanks the many individuals and organizations that provided samples for the 2022 Annual Pacific Northwest Crop Quality Survey, and recognizes with gratitude the project's funding partners:



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