



Canadian Grain Commission
Commission canadienne
des grains

ISSN 1498-9670

Quality of western Canadian wheat exports

2012

Contact: Michelle Frost

Technician, Baking Research

Tel. : 204-983-3509

Email: michelle.frost@grainscanada.gc.ca

Fax : 204-983-0724

Grain Research Laboratory

Canadian Grain Commission

1404-303 Main Street

Winnipeg MB R3C 3G8

www.grainscanada.gc.ca

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Quality of western Canadian wheat exports

February 1–July 31, 2012

Introduction

This bulletin reports quality data for cargoes of all classes of western Canadian wheat exported by ship from February 1 to July 31, 2012. Two types of information are presented:

- Distribution tables for moisture content, test weight and other grade determining factors assessed during grading of individual cargoes by Industry Services, Canadian Grain Commission (CGC), at time of vessel loading.
- Quality data (wheat and flour characteristics, milling, end-use quality) for weighted composite samples that represent all cargoes of a given grade (and protein segregate where appropriate) exported during the six-month period. Separate composites representing Atlantic and Pacific shipments are prepared and tested for Wheat, Canada Western Red Spring and Wheat, Canada Western Amber Durum. For the other wheat classes only one series of composites representing all cargoes (Atlantic and Pacific) exported from Canada during the period is reported. Quality data are not available for classes or protein segregates where insufficient sample was received for compositing due to low/no tonnage exported.

Variety registration and class designation lists ensure that a high degree of uniformity in quality is maintained in export shipments. Under the authority of the *Canada Grain Act*, the CGC establishes and maintains lists of wheat varieties eligible to be graded into each wheat class. A listing of varieties included in the CGC variety designation list for each class may be found on the CGC website at <http://grainscanada.gc.ca/legislation-legislation/orders-arretes/ocgcm-maccg-eng.htm>

Wheat, Canada Western Red Spring

Wheat, Canada Western Red Spring (CWRS) is well known for its excellent milling and baking quality. Four milling grades are available, the top two of which are further segregated according to protein content. Guaranteed minimum protein content is reported on a 13.5% moisture basis.

Higher protein CWRS wheat is highly suitable for blending and for the production of high volume pan bread. It is also commonly used alone or in blends with other wheat for the production of hearth bread, steamed bread, noodles, flat bread and common wheat pasta.

The predominant varieties of Wheat, Canada Western Red Spring represented in export cargoes were Harvest, Superb, Lillian, McKenzie, AC Intrepid, AC Barrie and Infinity.

**Table 1 - Moisture content, test weight and other grade determining factors¹
Atlantic export cargoes of Wheat, Canada Western Red Spring
Third and fourth quarters 2011-2012**

	No. 1 CWRS				No. 2 CWRS			No. 1 CWRS ²	No. 2 CWRS ²	No. 3 CWRS ²
	Guaranteed minimum protein content, %				protein content, %					
	14.0	13.5	13.0	12.5	13.5	13.0	12.5			
Number of cargoes	1	12	1	2	13	1	3	21	24	4
Thousands of tonnes	6	62	17	14	147	26	30	335	582	49
Moisture content, %										
Weighted mean	12.5	12.5	11.8	12.2	12.6	12.2	11.9	12.3	12.4	12.2
Standard deviation	0.00	0.22	0.00	0.57	0.21	0.00	0.32	0.27	0.31	0.43
Minimum	12.5	12.3	11.8	12.0	12.4	12.2	11.7	11.7	11.8	11.9
Maximum	12.5	12.9	11.8	12.8	13.2	12.2	12.3	13.0	13.3	12.9
Test weight, kg/hL										
Weighted mean	82.5	84	83.1	83.5	83.7	82.9	83.5	83.6	83.5	83.7
Standard deviation	0.00	0.32	0.00	0.57	0.66	0.00	0.50	0.42	0.30	0.59
Minimum	82.5	83.5	83.1	83.3	82.4	82.9	83.3	82.9	82.9	82.9
Maximum	82.5	84.4	83.1	84.1	84.5	82.9	84.3	84.6	83.9	84.2
Wheats of other classes, %										
Weighted mean	0.30	0.17	0.20	0.20	0.14	0.40	0.69	0.23	0.57	0.52
Cereal grains other than wheat, %										
Weighted mean	0.06	0.05	0.09	0.06	0.05	0.07	0.05	0.09	0.12	0.12

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

² Not segregated by protein content.

**Table 2 - Wheat, Canada Western Red Spring
Atlantic export cargo composites
Third and fourth quarters 2011-2012**

Quality parameter ¹	No. 1 CWRS		No. 2 CWRS		No. 3 CWRS
	Guaranteed minimum protein content, %	1CWRS ²	Guaranteed minimum protein content, %	2CWRS ²	3CWRS ²
	13.5		13.5		
Wheat					
Weight per 1000 kernels, g	35.5	33.3	31.0	33.5	34.5
Protein content, %	13.7	13.4	13.8	13.3	13.4
Protein content, % (dry matter basis)	15.9	15.5	15.9	15.3	15.5
Ash content, %	1.63	1.63	1.61	1.64	1.64
Falling number, s	460	450	435	460	455
PSI	54	53	52	52	51
Milling Flour Yield					
Clean wheat basis, %	76.5	76.5	76.3	76.5	75.6
0.50% ash basis, %	76.0	76.5	76.3	76.0	74.6
Flour					
Protein content, %	13.1	12.8	13.0	12.5	12.7
Wet gluten content, %	37.1	36.4	36.9	36.1	36.4
Ash content, %	0.51	0.50	0.50	0.51	0.52
Brightness, L*	93.8	93.9	93.9	93.9	93.9
Redness, a*	0.58	0.55	0.55	0.54	0.53
Yellowness, b*	10.1	10.0	9.7	9.9	10.0
Starch damage, %	9.1	9.3	8.9	9.3	9.4
Amylograph peak viscosity, BU	650	660	610	605	545
Maltose value, g/100g	3.1	3.0	2.9	3.0	3.2
Farinogram					
Absorption, %	68.6	68.4	68.4	68.7	68.9
Development time, min	6.00	5.75	6.25	5.50	5.50
Mixing tolerance index, BU	20	20	25	30	25
Stability, min	10.5	9.5	10.5	10.0	9.5
Extensogram					
Length, cm	19	19	19	19	18
Height at 5 cm, BU	290	250	280	280	285
Maximum height, BU	460	410	445	450	425
Area, cm ²	115	105	110	105	100
Alveogram					
Length, mm	89	82	92	81	77
P (height x 1.1), mm	140	136	142	135	138
W, x 10 ⁻⁴ joules	417	378	438	372	361
Baking (Canadian Short Process baking test)					
Absorption, %	68	67	67	68	67
Mixing energy, W-h/kg	9.0	9.4	8.3	7.0	7.1
Mixing time, min	3.9	3.9	3.8	3.5	3.4
Loaf volume, cm ³ /100 g flour	1040	1040	1070	1065	1010

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

² Not segregated by protein content.

**Table 3 - Moisture content, test weight and other grade determining factors¹
Pacific export cargoes of Wheat, Canada Western Red Spring
Third and fourth quarters 2011-2012**

	No. 1 CWRs				No. 1 CWRs ²		
	Guaranteed minimum protein content, %						
	13.5	13.0	12.5	12.0			
Number of cargoes	10	8	22	5	33		
Thousands of tonnes	134	126	374	75	799		
Moisture content, %							
Weighted mean	12.4	12.4	12.4	12.0	12.2		
Standard deviation	0.45	0.43	0.51	0.88	0.48		
Minimum	11.8	11.4	11.5	11.6	11.1		
Maximum	13.2	12.8	13.7	13.8	13.3		
Test weight, kg/hL							
Weighted mean	84.3	83.9	84.5	84.6	84.3		
Standard deviation	1.16	0.34	0.80	0.49	0.38		
Minimum	83.1	83.5	83.6	83.9	83.0		
Maximum	87.3	84.6	87.7	85.1	84.9		
Wheats of other classes, %							
Weighted mean	0.25	0.15	0.39	0.26	0.28		
Cereal grains other than wheat, %							
Weighted mean	0.09	0.10	0.12	0.13	0.11		
	No. 2 CWRs						
	Guaranteed minimum protein content, %					No. 2 CWRs ²	No. 3 CWRs ²
	14.0	13.5	13.0	12.5	12.0		
Number of cargoes	3	8	16	25	5	35	28
Thousands of tonnes	63	162	245	409	75	894	382
Moisture content, %							
Weighted mean	13.1	12.8	13.0	13.0	12.8	13.1	13.1
Standard deviation	0.25	0.29	0.54	0.60	0.84	0.49	0.50
Minimum	12.8	12.4	12.4	12.0	12.1	12.3	12.2
Maximum	13.3	13.2	13.9	14.0	13.9	14.2	14.1
Test weight, kg/hL							
Weighted mean	83.3	83.5	83.7	83.9	84.1	83.4	83.2
Standard deviation	0.12	0.47	0.43	0.89	0.59	1.94	0.57
Minimum	83.3	83.0	82.9	82.3	83.3	72.5	82.2
Maximum	83.5	84.2	84.5	87.3	84.7	84.5	84.5
Wheats of other classes, %							
Weighted mean	0.37	0.28	0.47	0.21	0.29	0.26	0.52
Cereal grains other than wheat, %							
Weighted mean	0.08	0.14	0.14	0.16	0.16	0.12	0.21

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

² Not segregated by protein content.

**Table 4a - Wheat, No. 1 Canada Western Red Spring
Pacific export cargo composites
Third and fourth quarters 2011-2012**

Quality parameter ¹	No. 1 CWRS				1CWRS ²
	Guaranteed minimum protein content, %				
	12.0	12.5	13.0	13.5	
Wheat					
Weight per 1000 kernels, g	35.8	36.5	36.9	34.1	36.7
Protein content, %	12.2	12.8	13.1	13.7	13.4
Protein content, % (dry matter basis)	14.1	14.7	15.2	15.8	15.4
Ash content, %	1.52	1.55	1.58	1.58	1.56
Falling number, s	450	440	465	470	465
PSI	50	52	52	52	52
Milling Flour Yield					
Clean wheat basis, %	76.0	76.3	76.2	76.2	76.2
0.50% ash basis, %	76.5	76.8	76.7	76.7	76.7
Flour					
Protein content, %	11.6	12.0	12.5	13.0	12.6
Wet gluten content, %	33.2	35.5	36.6	38.9	36.4
Ash content, %	0.49	0.49	0.49	0.49	0.49
Brightness, L*	94.3	94.4	94.3	94.0	94.1
Redness, a*	0.50	0.51	0.52	0.57	0.53
Yellowness, b*	10.0	9.9	9.9	9.9	9.9
Starch damage, %	10.5	10.3	9.9	9.4	9.9
Amylograph peak viscosity, BU	585	580	645	620	660
Maltose value, g/100g	3.5	3.4	3.3	3.1	3.2
Farinogram					
Absorption, %	69.8	70.2	69.8	69.5	70.1
Development time, min	5.50	5.50	6.00	6.25	5.75
Mixing tolerance index, BU	20	30	25	20	15
Stability, min	9.5	7.5	9.5	13.0	13.5
Extensogram					
Length, cm	16	18	19	19	19
Height at 5 cm, BU	340	280	280	280	270
Maximum height, BU	495	425	445	450	425
Area, cm ²	100	100	105	110	105
Alveogram					
Length, mm	61	65	75	86	74
P (height x 1.1), mm	167	150	150	136	153
W, x 10 ⁻⁴ joules	442	357	392	388	394
Baking (Canadian Short Process baking test)					
Absorption, %	69	69	68	69	69
Mixing energy, W-h/kg	7.9	8.0	7.8	7.9	9.0
Mixing time, min	3.6	3.5	3.5	3.4	3.6
Loaf volume, cm ³ /100 g flour	1005	965	1030	1040	1030

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

² Not segregated by protein content.

**Table 4b - Wheat, - No. 2 and No. 3 Canada Western Red Spring
Pacific export cargo composites
Third and fourth quarters 2011-2012**

Quality parameter ¹	No. 2 CWRS				No. 3 CWRS
	Guaranteed minimum protein content, %				3CWRS ²
	12.0	12.5	13.0	13.5	
Wheat					
Weight per 1000 kernels, g	36.9	37.5	36.2	34.1	37.0
Protein content, %	12.2	12.7	13.1	13.6	12.9
Protein content, % (dry matter basis)	14.1	14.7	15.1	15.8	14.9
Ash content, %	1.53	1.56	1.57	1.62	1.57
Falling number, s	445	445	440	425	450
PSI	51	53	53	53	51
Milling Flour Yield					
Clean wheat basis, %	75.6	76.2	76.2	76.3	75.7
0.50% ash basis, %	76.1	76.7	76.2	75.8	74.7
Flour					
Protein content, %	11.5	12.1	12.6	13.1	12.3
Wet gluten content, %	33.2	35.1	36.8	38.8	35.4
Ash content, %	0.49	0.49	0.50	0.51	0.52
Brightness, L*	94.4	94.1	94.0	94.2	94.2
Redness, a*	0.50	0.53	0.55	0.55	0.52
Yellowness, b*	9.8	9.6	9.6	9.8	9.6
Starch damage, %	10.6	9.9	9.9	9.7	10.2
Amylograph peak viscosity, BU	560	610	545	610	470
Maltose value, g/100g	3.6	3.3	3.2	3.1	3.4
Farinogram					
Absorption, %	70.8	69.5	70.1	70.1	70.7
Development time, min	4.75	7.25	5.25	6.00	5.75
Mixing tolerance index, BU	20	15	15	25	20
Stability, min	9.5	15.5	12.5	10.0	14.5
Extensogram					
Length, cm	17	16	20	19	18
Height at 5 cm, BU	255	360	255	260	290
Maximum height, BU	390	525	405	405	430
Area, cm ²	90	110	105	100	100
Alveogram					
Length, mm	47	61	85	105	61
P (height x 1.1), mm	178	154	155	140	157
W, x 10 ⁻⁴ joules	334	344	378	460	357
Baking (Canadian Short Process baking test)					
Absorption, %	69	69	69	69	68
Mixing energy, W-h/kg	7.4	8.1	7.6	7.3	8.7
Mixing time, min	3.4	3.5	3.3	3.3	3.6
Loaf volume, cm ³ /100 g flour	975	995	1020	1055	1000

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

² Not segregated by protein content.

Wheat, Canada Western Amber Durum

Canada has an international reputation as a reliable supplier of high quality durum wheat, furnishing about two thirds of the world's exports in recent years. The attributes of Canadian durum that attract demand are reliability of supply, cleanliness, uniformity and consistency within and between shipments, and excellent end-product quality.

Canada has a strong commitment to quality. This extends to strict varietal control to protect the inherent quality of all grades of amber durum wheat and to strict adherence to wheat grade standards. The requirement that only durum varieties of high intrinsic quality are registered is a cornerstone of the Canadian grading system.

The predominant varieties of Wheat, Canada Western Amber Durum represented in export cargoes were Strongfield, AC Avonlea, AC Navigator, CDC Verona and Kyle.

**Table 5 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Western Amber Durum
Third and fourth quarters 2011-2012**

	No. 1 CWAD		No. 2 CWAD		No. 3 CWAD	
	Atlantic	Pacific	Atlantic	Pacific	Atlantic	Pacific
Number of cargoes	40	13	23	9	23	3
Thousands of tonnes	612	100	259	66	370	19
Moisture content, %						
Weighted mean	11.1	11.4	11.3	11.4	11.7	11.9
Standard deviation	0.24	0.22	0.24	0.57	0.16	0.06
Minimum	10.5	11.0	10.8	10.9	11.3	11.9
Maximum	11.6	11.7	11.7	12.9	11.8	12.0
Test weight, kg/hL						
Weighted mean	83.7	83.5	83.4	83.2	82.8	82.8
Standard deviation	0.42	0.22	0.50	0.43	0.45	0.25
Minimum	83.0	83.3	82.6	82.7	81.7	82.4
Maximum	84.6	84.1	84.3	83.9	83.5	82.4
Vitreous kernels, %						
Weighted mean	85.4	86.6	81.8	82.6	78.5	79.1
Wheats of other classes, %						
Weighted mean	0.57	0.40	0.73	0.73	0.91	1.04
Cereal grains other than wheat, %						
Weighted mean	0.08	0.08	0.11	0.15	0.11	0.16

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

**Table 6a - Wheat, No. 1 Canada Western Amber Durum
Atlantic and Pacific Export cargo composites
Third and fourth quarters 2011-2012**

Quality parameter ¹	No. 1 CWAD		
	Atlantic	Pacific	Bi-coastal
Wheat			
Test weight, kg/hL	84.0	83.7	83.7
Weight per 1000 kernels, g	43.4	43.1	43.3
Vitreous kernels, %	87	86	92
Protein content, %	12.6	13.1	12.5
Ash content, %	1.48	1.50	1.50
Falling number, s	475	445	475
PSI, %	36.8	36.6	36.5
Milling			
Total Milling yield, %	75.7	76.4	76.0
Semolina yield, %	67.2	67.8	67.8
Semolina ash content, %	0.64	0.65	0.63
Speck count per 50 cm ²			
Total	31	26	32
Dark	6	8	8
Large (≥ 0.06 mm ²)	11	8	10
Semolina²			
Protein content, %	11.5	12.0	11.5
Wet gluten content, %	30.3	31.4	30.3
Gluten index, %	63	59	58
Alveogram			
Length, mm	81	88	87
P (height x 1.1), mm	59	58	58
P/L	0.73	0.66	0.67
W, x 10 ⁻⁴ joules	142	148	143
Yellow pigment content, ppm	8.5	8.7	8.5
Yellowness, b*	30.4	31.1	30.6
Dough sheet colour at (0.5 hrs) 24 hrs			
Brightness, L*	80.6 (77.2)	80.1 (76.1)	80.8 (75.9)
Redness, a*	-1.2 (-0.6)	-0.9 (0.0)	-1.0 (-0.2)
Yellowness, b*	33.2 (34.9)	31.9 (33.1)	32.3 (34.0)
Falling number, s	565	595	540
Spaghetti - Dried at 85°C			
Brightness, L*	73.5	73.0	73.4
Redness, a*	5.3	5.8	5.5
Yellowness, b*	62.3	61.6	62.0
Strand diameter, mm			
Dry	1.67	1.69	1.68
Cooked	2.50	2.52	2.52
Texture - Cutting force (g) at			
25% diameter	98	102	100
50% diameter	327	348	338
Peak	578	576	557

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for semolina.

² Semolina analysis is conducted using granular products with a constant extraction rate of 70%.

**Table 6b - Wheat, No. 2 and No. 3 Canada Western Amber Durum
Atlantic and Pacific Export cargo composites
Third and fourth quarters 2011-2012**

Quality parameter ¹	No. 2 CWAD			No. 3 CWAD	
	Atlantic	Pacific	Bi-coastal	Atlantic	Pacific
Wheat					
Test weight, kg/hL	83.5	83.9	84.0	83.3	84.1
Weight per 1000 kernels, g	43.3	43.5	43.7	45.0	44.8
Vitreous kernels, %	84	78	83	94	77
Protein content, %	12.4	12.5	12.4	12.7	13.0
Ash content, %	1.52	1.52	1.53	1.59	1.57
Falling number, s	460	480	440	400	445
PSI, %	37.5	37.3	36.3	37.4	37.2
Milling					
Total Milling yield, %	75.7	75.9	75.7	76.1	76.2
Semolina yield, %	67.0	67.2	67.0	67.6	67.6
Semolina ash content, %	0.65	0.65	0.65	0.67	0.68
Speck count per 50 cm ²					
Total	39	41	31	52	47
Dark	11	13	9	17	16
Large (≥ 0.06 mm ²)	12	15	10	18	17
Semolina²					
Protein content, %	11.4	11.4	11.4	11.8	12.0
Wet gluten content, %	30.7	29.9	30.9	31.6	31.9
Gluten index, %	58	60	53	56	53
Alveogram					
Length, mm	83	85	83	79	87
P (height x 1.1), mm	59	61	62	57	60
P/L	0.71	0.72	0.75	0.72	0.69
W, x 10 ⁻⁴ joules	142	150	148	133	149
Yellow pigment content, ppm	8.4	8.5	8.4	8.4	8.4
Yellowness, b*	29.8	30.4	30.2	30.0	30.1
Dough sheet colour at (0.5 hrs) 24 hrs					
Brightness, L*	80.6 (76.9)	80.8 (76.1)	80.8 (77.4)	79.8 (75.3)	79.8 (75.7)
Redness, a*	-1.1 (-0.5)	-1.0 (-0.1)	-1.0 (-0.3)	0.1 (0.4)	-0.7 (0.3)
Yellowness, b*	32.9 (34.9)	30.7 (31.1)	32.6 (33.5)	30.1 (29.7)	30.6 (31.5)
Falling number, s	510	590	545	510	500
Spaghetti - Dried at 85°C					
Brightness, L*	73.3	73.0	73.4	72.1	72.2
Redness, a*	5.6	5.8	5.6	6.5	6.3
Yellowness, b*	62.2	61.7	62.2	60.5	60.4
Strand diameter, mm					
Dry	1.68	1.68	1.68	1.69	1.68
Cooked	2.50	2.50	2.51	2.50	2.51
Texture - Cutting force (g) at					
25% diameter	97	98	99	99	103
50% diameter	323	329	333	332	347
Peak	561	568	568	568	602

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for semolina.

² Semolina analysis is conducted using granular products with a constant extraction rate of 70%.

Wheat, Canada Western Hard White Spring

Wheat, Canada Western Hard White Spring (CWHWS) is a hard white spring wheat with superior milling quality producing flour with excellent colour. It is suitable for bread and noodle production.

There are three milling grades in the CWHWS class.

The most commonly grown varieties of CWHWS are Snowstar and Snowbird.

**Table 7 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Western Hard White Spring
Third and fourth quarters 2011-2012**

No. 2 CWHWS	
Number of cargoes	2
Thousands of tonnes	25
Moisture content, %	
Weighted mean	12.2
Standard deviation	0.21
Minimum	12.0
Maximum	12.3
Test weight, kg/hL	
Weighted mean	85.3
Standard deviation	0.49
Minimum	85.0
Maximum	85.7
Wheats of other classes, %	
Weighted mean	1.03
Cereal grains other than wheat, %	
Weighted mean	0.07

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

Wheat, Canada Prairie Spring Red

Wheat, Canada Prairie Spring Red (CPSR), used alone or in blends, has quality characteristics suitable for the production of various types of hearth bread, flat bread, noodles and related products.

The most commonly grown varieties eligible for milling grades of CPSR are AC Foremost, 5700PR, AC Crystal and 5701PR.

**Table 8 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Prairie Spring Red
Third and fourth quarters 2011-2012**

	No. 1 CPSR	No. 2 CPSR
Number of cargoes	1	2
Thousands of tonnes	8	18
Moisture content, %		
Weighted mean	14.1	13.5
Standard deviation	0.00	0.21
Minimum	14.1	13.3
Maximum	14.1	13.6
Test weight, kg/hL		
Weighted mean	81.2	82.2
Standard deviation	0.00	0.07
Minimum	81.2	82.1
Maximum	81.2	82.2
Wheats of other classes, %		
Weighted mean	0.19	0.41
Cereal grains other than wheat, %		
Weighted mean	0.34	0.26

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

Wheat, Canada Western Red Winter

Wheat, Canada Western Red Winter (CWRW) is a hard wheat exhibiting excellent milling quality. It is available in two milling grades. Flour produced from high grade CWRW wheat performs well in the production of hearth bread (such as French-style bread) and certain types of noodles, and is also suitable for the production of various types of flat bread, steamed bread and related products.

The most commonly grown varieties eligible for milling grades of CWRW are Radiant, CDC Buteo, AC Bellatrix and CDC Falcon.

**Table 9 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Western Red Winter
Third and fourth quarters 2011-2012**

	No. 1 CWRW	No. 3 CWRW
Number of cargoes	1	6
Thousands of tonnes	2	46
Moisture content, %		
Weighted mean	13.2	12.2
Standard deviation	0.00	0.81
Minimum	13.2	11.4
Maximum	13.2	13.6
Test weight, kg/hL		
Weighted mean	83.6	84.4
Standard deviation	0.00	1.56
Minimum	83.6	81.6
Maximum	83.6	85.5
Wheats of other classes, %		
Weighted mean	0.20	0.63
Cereal grains other than wheat, %		
Weighted mean	0.04	0.10

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

**Table 10 - Wheat, Canada Western Red Winter
Export cargo composites
Third and fourth quarter 2011-2012**

Quality parameter ¹	No. 3 CWRW
Wheat	
Weight per 1000 kernels, g	84.4
Protein content, %	10.5
Protein content, % (dry matter basis)	12.2
Ash content, %	1.44
Falling number, s	410
PSI	60
Milling Flour Yield	
Clean wheat basis, %	76.6
0.50% ash basis, %	79.1
Flour	
Protein content, %	9.6
Wet gluten content, %	24.8
Ash content, %	0.45
Grade colour, Satake units	-2.9
Brightness, L*	94.8
Redness, a*	0.34
Yellowness, b*	9.4
Starch damage, %	7.5
Amylograph peak viscosity, BU	540
Maltose value, g/100g	2.5
Farinogram	
Absorption, %	58.7
Development time, min	7.00
Mixing tolerance index, BU	40
Stability, min	9.5
Extensogram	
Length, cm	15
Height at 5 cm, BU	470
Maximum height, BU	660
Area, cm ²	120
Alveogram	
Length, mm	90
P (height x 1.1), mm	87
W, x 10 ⁻⁴ joules	266
Baking (Remix-to-Peak baking test)	
Absorption, %	57
Mixing energy, W-h/kg	4
Remix time, min	2.4
Loaf volume, cm ³ /100 g flour	760

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

Wheat, Canada Western Extra Strong

Wheat, Canada Western Extra Strong (CWES) is a red spring wheat. The most widely grown varieties are Bluesky, Burnside, Glencross VB and Glenlea.

Flour milled from this wheat is characterized by very strong gluten. Dough made from CWES wheat flour cannot be properly developed at the normal farinograph speed of 63 rpm and must be tested at the higher speed of 90 rpm to obtain a true mixing peak.

The strong physical dough properties of CWES wheat make it ideal for blending and for specialty products in which very high gluten strength is needed.

Two milling grades have been established for this class.

**Table 11 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Western Extra Strong
Third and fourth quarters 2011-2012**

	No. 2 CWES
Number of cargoes	1
Thousands of tonnes	6
Moisture content, %	
Weighted mean	13.6
Standard deviation	0.00
Minimum	13.6
Maximum	13.6
Test weight, kg/hL	
Weighted mean	82.0
Standard deviation	0.00
Minimum	82.0
Maximum	82.0
Wheats of other classes, %	
Weighted mean	0.10
Cereal grains other than wheat, %	
Weighted mean	0.09

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

Wheat, Canada Western Soft White Spring

Wheat, Canada Western Soft White Spring (CWSWS) is a lower protein, soft wheat with weak dough properties. Flour milled from this wheat is suitable for producing cookies, cakes, biscuits and related products. Alone or in blends with stronger wheat, CWSWS wheat can also be used to produce crackers, flat bread, steamed bread and certain types of noodles.

The most commonly grown variety of CWSWS is AC Andrew.