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# Quality of Ontario wheat 2011

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# Quality of Ontario wheat– 2011

## Introduction

Ontario wheat production for the 2011 crop year was estimated at 2.3 million tonnes<sup>1</sup>. The primary grading factors were mildew and total smudge. The majority of the samples used in the preparation of all grade composites were supplied by the Grain Farmers of Ontario (GFO) from all wheat growing areas on the basis of county production. Additional samples were obtained directly from Ontario producers. Individual samples were forwarded to the Canadian Grain Commission office in Winnipeg for grading and preliminary analyses. Composite samples representing soft white winter, hard red winter and soft red winter wheat varieties were made by the Grain Research Laboratory, Canadian Grain Commission for quality analysis and results are shown in Tables 1-3. Insufficient numbers of samples of hard red spring wheat were received to produce a robust composite. Data from the 2010 survey are shown in the quality table for comparison purposes where available otherwise data from the most recently reported harvest year have been used. The average values obtained over the previous ten crop years for the No. 1 grades are also provided for comparison for each wheat class.

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<sup>1</sup> Statistics Canada, *Field Crop Reporting Series*, <http://www.statcan.gc.ca/pub/22-002-x/22-002-x2011007-eng.pdf> Vol. 90, No. 7, Oct. 2011

## Wheat, Canada Eastern White Winter

Table 1 shows data for the Canada Eastern White Winter (CEWW) wheat grade composites. Comparisons are made with 2008 harvest as no composites were produced for this grade in 2009 or 2010. There was no No. 2 CEWW grade composite for 2011. For this year's No. 1 grade composite, the test weight is similar, however, kernel weight is lower than the 2008 value and the long term average. Wheat protein is slightly lower than 2008. The falling number, amylograph peak viscosity and alpha-amylase activity indicate the soundness expected in the No. 1 grade. Milling yield, on clean wheat basis, is similar to 2008 and the long term average, but flour ash content is slightly higher. Farinograph shows 1.5% lower water absorption than 2008 and almost 1% lower than the ten year average. Dough development time and mixing tolerance are similar to 2008, however, the stability is much lower. Alveograph results are comparable to 2008. The AACC sugar snap cookie test exhibits slightly more spread and a higher ratio relative to 2008. Electrophoretic analysis of the No. 1 grade composite indicates AVA sww to be the predominant variety followed by 25W36, E0028W, and 25W43. These four varieties accounted for 93% of the varieties in the 2011 composite.

## Wheat, Canada Eastern Soft Red Winter

Quality data for No. 1 and No. 2 Canada Eastern Soft Red Winter (CESRW) wheat composites are shown in Table 2. There was no comparable No. 1 grade

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composite produced in 2010 so values for the 2010 No. 2 composite are included for comparison purposes. Test weight, kernel weight and wheat ash content for the No. 1 grade are similar to values for the long term average. Wheat protein is 0.5% lower for 2011 No. 1 CESRW compared with the ten year average. Wheat protein content for No. 2 CESRW is similar to 2010. Wheat falling number, flour amylograph peak viscosity values and alpha-amylase activity indicate soundness in both the No. 1 and No. 2 grades of 2011 CESRW. Milling yield for No. 1 CESRW exhibits a 1.1% yield advantage over the long term average. No. 2 CESRW shows a slight improvement in milling yield over last year but is yielding 1.1% higher than the long term average for No. 1 CESRW. Flour ash content is slightly higher this year. Flour colour is similar to flour colour for the corresponding grade from previous years. Wet gluten content for the 2011 No. 1 CESRW is consistent with the long term average. The No. 2 CESRW this year is slightly higher than last year and the long term average for No. 1 CESRW. Farinograph absorption for No. 1 CESRW is 1.5% lower than the long term average but is of comparable strength. The No. 2 grade exhibits marginally higher farinograph absorption this year compared with 2010, and while the development times and stabilities are similar the rate of breakdown, measured as MTI, is less rapid this year compared to last year. Alveograph data indicate less extensibility but similar resistance to deformation resulting in lower W values for both the No.1 and No. 2 grades compared to the long term average. Cookie spread is slightly higher as is the ratio of spread to thickness for both grades compared with the long term average, but the No. 2 CESRW is exhibiting slightly less cookie spread compared with last year. Electrophoretic analyses of both grades indicates 25R47 to be the predominant variety followed by 25R56.

## Wheat, Canada Eastern Hard Red Winter

Table 3 shows data for Canada Eastern Hard Red Winter (CEHRW) wheat composites, with results for the No. 1 grade from 2008 and average results over the long term (2001-2010) for comparison. Test weight is lower than in 2008 while kernel weight is slightly higher than 2008 and considerably higher than the long term average. Wheat protein content for No. 1 and No. 2 is slightly lower when compared to 2008, but the No. 1 CEHRW is 1.0% lower this year compared with the long term average. Wheat falling number and amylograph peak viscosity are significantly higher for both grades this year while wheat and flour alpha-amylase values are considerably lower indicating a higher degree of soundness compared to 2008 and the long term average. Milling yield is lower than 2008, but both grades exhibit at least a 1.0% yield advantage over the long term average values. In addition, flour ash content for No. 1 CEHRW is 0.04% and 0.03% lower than 2008 and the long term average, respectively, indicating the potential for higher milling extraction rates while meeting ash specifications. No. 2 CEHRW is exhibiting ash content 0.01% lower than the No. 1 grade, at a slightly higher extraction rate, demonstrating excellent milling quality this year. Lower wheat protein content is resulting in lower flour protein content, with both grades approximately 1% lower than 2008 and the long term average. Flour colour is showing improvement over 2008 and the long term average. Starch damage for No. 1 CEHRW is similar to 2008, but is slightly higher than the long term average. Farinograph water absorption is lower with weaker dough strength properties compared with 2008 and the long term. Extensograph results for No. 1 CEHRW indicate less extensible dough but similar

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resistance to extension relative to 2008 and the long term average. Consistent with extensograph results, alveograph extensibility (L) is less than seen over the long term, but resistance to deformation (P) is slightly higher. Remix-to-peak bake absorption and mixing requirements for both grades are comparable to 2008 and the long term average. Loaf volumes are similar to 2008 and the long term average, but with approximately 1% lower flour protein content, indicating improved baking quality. Electrophoretic analysis of the No. 1 grade composite indicates Princeton to be the predominant variety.

## **Wheat, Canada Eastern Hard Red Spring**

See introduction regarding insufficient sample to produce composite for this class.

**Table 1 - Wheat, Canada Eastern White Winter  
Quality data for 2011 harvest sample grade composites compared to 2008\* and 2001-2010  
mean**

Quality parameter <sup>1</sup>	2011	2008	2001-10 mean <sup>3</sup>
	No. 1	No. 1	No. 1
<b>Wheat</b>			
Test weight, kg/hL	80.6	81.2	79.8
Weight per 1000 kernels, g	33.9	38.2	35.7
Protein content, %	9.1	9.4	9.7
Protein content, % (dry matter basis)	10.6	10.9	11.2
Ash content, %	1.53	1.58	1.52
$\alpha$ -amylase activity, units/g	1.0	2.5	5.5
Falling number, s	385	360	349
PSI, %	74	68	70
Flour yield, %	76.5	76.7	76.0
<b>Flour</b>			
Protein content, %	8.2	8.4	8.8
Wet gluten content, %	22.7	22.2	22.6
Ash content, %	0.52	0.50	0.50
Grade colour, Satake units	-1.7	-1.5	-1.7
Brightness, <sup>2</sup> L*	86.1	N/A <sup>4</sup>	N/A <sup>4</sup>
Redness, <sup>2</sup> a*	-1.40	N/A <sup>4</sup>	N/A <sup>4</sup>
Yellowness, <sup>2</sup> b*	17.9	N/A <sup>4</sup>	N/A <sup>4</sup>
Starch damage, %	3.5	3.6	3.3
$\alpha$ -amylase activity, units/g	0.5	0.5	2.4
Amylograph peak viscosity, BU	565	455	443
Maltose value, g/100g	1.3	1.2	1.2
AWRC, %	57.2	58.8	60.1
<b>Farinogram</b>			
Absorption, %	50.1	51.6	51.0
Development time, min	1.00	1.00	1.29
Mixing tolerance index, BU	105	90	108
Stability, min	1.5	3.0	2.5
<b>Alveogram</b>			
Length, mm	104	102	131
P (height x 1.1), mm	24	26	25
W, x 10 <sup>-4</sup> joules	50	49	73
<b>Cookie test</b>			
Spread, mm	84.1	82.4	83.0
Ratio (spread/thickness)	9.4	8.7	9.0

\* No data available for 2009 and 2010 harvest.

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

<sup>2</sup> Colour measured on flour/water slurry. See <http://grainscanada.gc.ca/wheat-ble/method-methode/wmtm-mmab-eng.htm>.

<sup>3</sup> No data available for 2004, 2009 and 2010 harvest.

<sup>4</sup> Not available due to change in method. See <http://grainscanada.gc.ca/wheat-ble/method-methode/wmtm-mmab-eng.htm>.

**Table 2 - Wheat, Canada Eastern Soft Red Winter  
Quality data for 2011 harvest sample grade composites compared to 2010 and 2001-2010 mean**

Quality parameter <sup>1</sup>	2011		2010	2001-10 mean <sup>4</sup>
	No. 1	No. 2	No. 2 <sup>3</sup>	No. 1
<b>Wheat</b>				
Test weight, kg/hL	80.2	79.3	76.6	80.2
Weight per 1000 kernels, g	35.3	35.3	35.0	35.3
Protein content, %	9.0	9.2	9.0	9.5
Protein content, % (dry matter basis)	10.4	10.7	10.4	11.0
Ash content, %	1.49	1.45	1.48	1.50
$\alpha$ -amylase activity, units/g	1.0	1.5	2.5	3.1
Falling number, s	380	370	365	351
PSI, %	75	75	73	71
Flour yield, %	76.6	76.6	76.1	75.5
<b>Flour</b>				
Protein content, %	8.0	8.2	7.7	8.5
Wet gluten content, %	21.3	22.3	19.6	21.3
Ash content, %	0.49	0.48	0.46	0.47
Grade colour, Satake units	-0.6	0.1	0.1	-0.5
Brightness, <sup>2</sup> L*	85.3	84.5	N/A <sup>5</sup>	N/A <sup>5</sup>
Redness, <sup>2</sup> a*	-0.94	-0.76	N/A <sup>5</sup>	N/A <sup>5</sup>
Yellowness, <sup>2</sup> b*	17.3	16.4	N/A <sup>5</sup>	N/A <sup>5</sup>
Starch damage, %	3.5	3.5	3.2	3.3
$\alpha$ -amylase activity, units/g	0.5	0.5	1.0	1.0
Amylograph peak viscosity, BU	600	540	540	596
Maltose value, g/100g	1.1	1.1	1.1	1.1
AWRC, %	60.0	59.1	60.4	63.3
<b>Farinogram</b>				
Absorption, %	50.1	50.7	50.0	51.6
Development time, min	1.25	1.00	1.25	1.53
Mixing tolerance index, BU	90	85	105	95
Stability, min	2.5	1.5	1.5	2.6
<b>Alveogram</b>				
Length, mm	81	83	90	113
P (height x 1.1), mm	30	29	26	31
W, x 10 <sup>-4</sup> joules	54	54	55	86
<b>Cookie test</b>				
Spread, mm	85.1	84.6	85.9	83.4
Ratio (spread/thickness)	9.6	9.4	9.5	9.0

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

<sup>2</sup> Colour measured on flour/water slurry. See <http://grainscanada.gc.ca/wheat-ble/method-methode/wmtm-mmab-eng.htm>.

<sup>3</sup> No data available for No.1 for 2010.

<sup>4</sup> No data available for 2004, 2009 and 2010 harvest.

<sup>5</sup> Not available due to change in method. See <http://grainscanada.gc.ca/wheat-ble/method-methode/wmtm-mmab-eng.htm>.

**Table 3 - Wheat, Canada Eastern Hard Red Winter**  
**Quality data for 2011 harvest sample grade composites compared to 2008\* and 2001-2010 mean**

Quality parameter <sup>1</sup>	2011		2008	2001-10 mean <sup>3</sup>
	No. 1	No. 2	No. 1	No. 1
<b>Wheat</b>				
Test weight, kg/hL	81.9	79.5	83.2	82.2
Weight per 1000 kernels, g	40.9	42.5	40.4	37.7
Protein content, %	10.3	10.5	10.9	11.3
Protein content, % (dry matter basis)	11.9	12.1	12.6	13.2
Ash content, %	1.48	1.49	1.47	1.51
$\alpha$ -amylase activity, units/g	4.5	5.5	13.5	15.7
Falling number, s	415	395	345	336
PSI, %	59	60	53	58
Flour yield, %	76.5	76.7	77.8	75.5
<b>Flour</b>				
Protein content, %	9.4	9.5	10.3	10.6
Wet gluten content, %	23.5	23.4	25.9	26.8
Ash content, %	0.47	0.46	0.51	0.50
Grade colour, Satake units	-1.5	-1.5	-0.3	-0.7
Brightness, <sup>2</sup> L*	85.7	85.7	N/A <sup>4</sup>	N/A <sup>4</sup>
Redness, <sup>2</sup> a*	-0.36	-0.47	N/A <sup>4</sup>	N/A <sup>4</sup>
Yellowness, <sup>2</sup> b*	15.0	14.9	N/A <sup>4</sup>	N/A <sup>4</sup>
Starch damage, %	7.5	6.9	7.3	6.9
$\alpha$ -amylase activity, units/g	2.0	2.5	5.0	6.0
Amylograph peak viscosity, BU	455	385	230	244
Maltose value, g/100g	2.6	2.3	2.6	2.6
<b>Farinogram</b>				
Absorption, %	59.0	58.1	60.6	60.5
Development time, min	1.75	1.75	4.00	3.09
Mixing tolerance index, BU	40	50	40	43
Stability, min	4.5	4.0	6.5	5.7
<b>Extensogram</b>				
Length, cm	15	16	17	18
Height at 5 cm, BU	315	255	250	266
Maximum height, BU	405	335	370	394
Area, cm <sup>2</sup>	80	75	80	100
<b>Alveogram</b>				
Length, mm	72	91	78	92
P (height x 1.1), mm	96	77	98	88
W, x 10 <sup>-4</sup> joules	239	225	258	265
<b>Baking (Remix-to-peak baking test)</b>				
Absorption, %	57	56	57	56
Remix time, min	2.5	2.3	2.4	2.4
Mixing energy, W-h/kg	3.8	3.3	4.3	3.6
Loaf volume, cm <sup>3</sup> /100 g flour	715	710	720	701

\* No data available for 2009 and 2010 harvest.

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

<sup>2</sup> Colour measured on flour/water slurry. See <http://grainscanada.gc.ca/wheat-ble/method-methode/wmtm-mmab-eng.htm>.

<sup>3</sup> No data available for 2004, 2009 and 2010 harvest.

<sup>4</sup> Not available due to change in method. See <http://grainscanada.gc.ca/wheat-ble/method-methode/wmtm-mmab-eng.htm>.