



Canadian Grain  
Commission

Commission canadienne  
des grains

ISSN 1920-9053

# Quality of western Canadian peas

## 2014

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## Table of contents

<b>Introduction .....</b>	<b>3</b>
<b>Production .....</b>	<b>3</b>
<b>Western Canadian peas 2014 .....</b>	<b>4</b>
Pea samples .....	4
Quality Of 2014 western Canada peas .....	5

### Tables

Table 1 – Production statistics for western Canadian peas .....	3
Table 2 – Mean protein content for 2014 western Canadian peas (yellow and green combined) by grade .....	7
Table 3 – Mean protein content for 2014 western Canadian peas (yellow and green combined) by region .....	10
Table 4 – Quality data for 2014 western Canadian yellow pea composite by grade .....	11
Table 5 – Quality data for 2014 western Canadian green pea composite by grade.....	12

### Figures

Figure 1 – Map of western Canada showing origin of 2014 pea samples from Harvest Sample Program.....	4
Figure 2 – Mean protein content of western Canadian peas .....	8
Figure 3 – Crop regions in western Canada .....	9

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## Introduction

This report presents quality data for 2014 western Canadian peas from Canadian Grain Commission's Harvest Sample Program. Samples were submitted by western Canadian producers to the Canadian Grain Commission's Grain Research Laboratory for analysis.

## Production

Pea production for 2014 was estimated to be 3.4 million tonnes, which was down approximately 13% from 2013. However, production was higher than the 10-year average (Table 1). The decrease in production was the result of a 23% reduction in yield from 2013. Saskatchewan accounted for 60% of Canadian pea production, while Alberta accounted for 39% and Manitoba accounted for 1%.

**Table 1 – Production statistics for western Canadian peas<sup>1</sup>**

	Harvested area		Production		Yield		Mean production
Province	2014	2013	2014	2013	2014	2013	2004–2013
	thousand hectares		thousand tonnes		kg/ha		thousand tonnes
Peas							
Manitoba	21	24	44	68	2100	2800	83
Saskatchewan	967	902	2061	2572	2100	2800	2217
Alberta <sup>2</sup>	479	403	1340	1321	2797	3300	790
Western Canada	1467	1329	3445	3961	2300	3000	3090

<sup>1</sup>Statistics Canada.

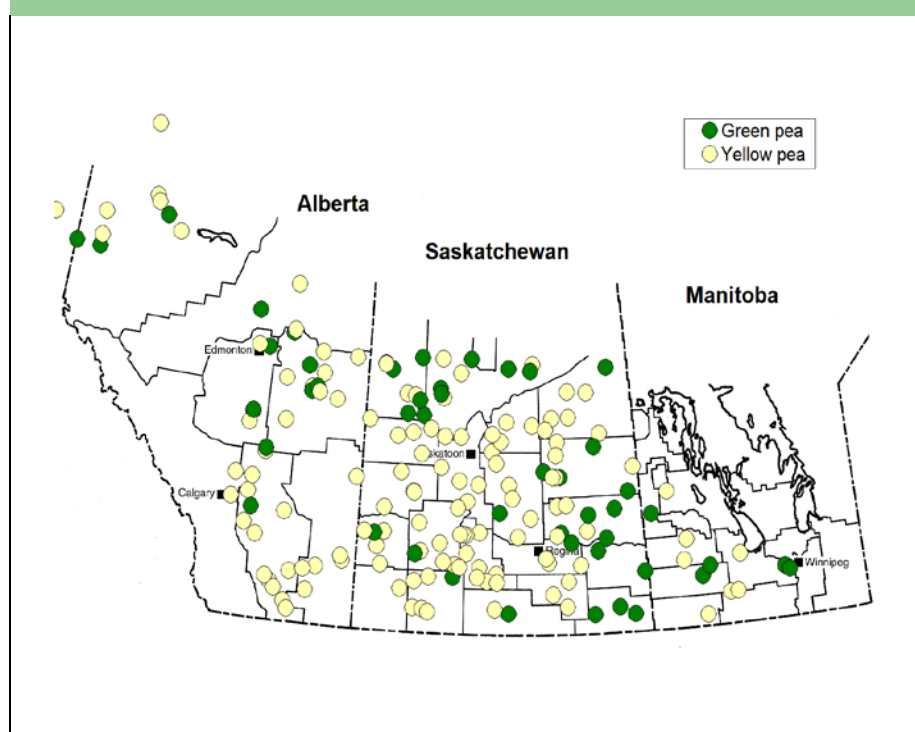
<sup>2</sup>Includes the Peace River area of British Columbia.

# Western Canadian peas 2014

## Pea samples

Samples for the Canadian Grain Commission's Harvest Sample Program were collected from producers across western Canada (Figure 1). The Canadian Grain Commission received 482 samples consisting of 364 yellow pea samples and 118 green pea samples. All samples were graded and tested for protein content. Composite samples were prepared based on class (yellow and green), crop region and grade (No. 1 and No. 2). All composites were tested for chemical composition (moisture, protein, starch and ash content), mineral content, functional properties (water hydration capacity and emulsifying capacity), and physical and cooking characteristics (100-seed weight, water absorption, cooking time and firmness of cooked peas). It is important to note that the samples reported by grade do not necessarily represent the actual distribution of grade.

**Figure 1 – Map of western Canada showing origin of 2014 pea samples from Harvest Sample Program**



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## Quality of 2014 western Canadian peas

Protein content for yellow and green peas ranged from 19.1% to 28.1% (Table 2). The mean protein content for western Canadian peas was 23.4%, which was higher than the mean of 22.0% for 2013, but similar to the ten-year mean protein content of 23.3% (Figure 2). Table 3 represents the mean protein and starch content for yellow and green peas by crop region (Figure 3).

Table 4 shows the quality data for 2014 yellow peas. Mean protein content for No. 1 Canada Yellow peas was 23.3%, which was higher than the mean for 2013 (21.7%). Mean protein content for No. 2 Canada Yellow peas was 23.5%, which was higher than the mean for 2013 (22.3%). Mean starch content for No. 1 Canada Yellow peas was 47.9%, similar to the mean for No. 2 Canada Yellow peas (48.0%). The mean starch content for both grades was slightly higher than the means for 2013. Mean ash content in both grades was slightly higher than that for 2013. Potassium (K) was the most abundant macroelement present in yellow peas, followed by phosphorus (P), magnesium (Mg) and calcium (Ca) (Table 4). Among microelements, iron (Fe) was the highest, followed by zinc (Zn), manganese (Mn), and copper (Cu). Mean water hydration capacity for No. 1 Canada Yellow peas was 0.74 g H<sub>2</sub>O per g sample, which was close to the mean value for 2013 (Table 4). Mean water hydration capacity for No. 2 Canada Yellow was 0.76 g H<sub>2</sub>O per g sample, which was also close to the mean value for 2013. The emulsifying capacity of No. 1 Canada Yellow peas was 275.6 mL oil per g sample, which was higher than that for 2013. The emulsifying capacity of No. 2 Canada Yellow peas was 283.05 mL oil per g sample, which was also higher than the emulsifying capacity for 2013.

Mean 100-seed weight for No. 1 Canada Yellow peas was 20.7 g (Table 4), while mean 100-seed weight for No. 2 Canada Yellow peas was 20.1 g. Mean 100-seed weights for both grades of peas were similar to those for 2013. The water absorption value for No. 1 Canada Yellow peas was 0.82 g H<sub>2</sub>O per g seeds. For No. 2 Canada Yellow peas, the water absorption value was 0.84 g H<sub>2</sub>O per g seeds. Water absorption values for both grades were similar to 2013 values.

Cooking times for No. 1 and No. 2 Canada Yellow peas were similar to those for 2013 (Table 4). For both No. 1 and No. 2 grades, mean firmness values of cooked peas were similar to values in 2013.

Table 5 shows the 2014 quality data for No. 1 Canada and No. 2 Canada Green peas. Mean protein content for No. 1 Canada Green peas was 23.6%, which was higher than the mean for 2013. Mean protein content for No. 2 Canada Green peas was 23.3%, which was similar to the mean for 2013. Mean starch content was 47.3% for No. 1 Canada Green peas and 47.7% for No. 2 Canada Green peas, slightly higher than the means for 2013. Ash content values for No. 1 and No. 2 Canada Green peas were similar to values in 2013. Similar trends to yellow peas for both

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macroelements and microelements in green peas were noted (Table 5). Mean water hydration capacity for No. 1 Canada Green peas (0.76 g H<sub>2</sub>O per g sample) was similar to the mean for No. 2 Canada Green peas (0.79 g H<sub>2</sub>O per g sample) (Table 5). The means for both grades were similar to the means for 2013. Mean emulsifying capacity was 279.5 mL oil per g sample for No. 1 Canada Green peas and 280.7 mL oil per g sample for No. 2 Canada Green peas, higher than in 2013.

Mean 100-seed weight for No. 1 Canada Green peas was 21.1 g, higher than 2013 (Table 5). Mean 100-seed weight for No. 2 Canada Green peas was 19.2 g, slightly lower than 2013. Mean water absorption values for No. 1 and No. 2 Canada Green peas were higher than for 2013. Mean cooking time for No. 1 Canada Green peas was 14.6 min and was 17.1 min for No. 2 Canada Green peas. Mean firmness values for cooked green peas for both grades were slightly higher than values for 2013.

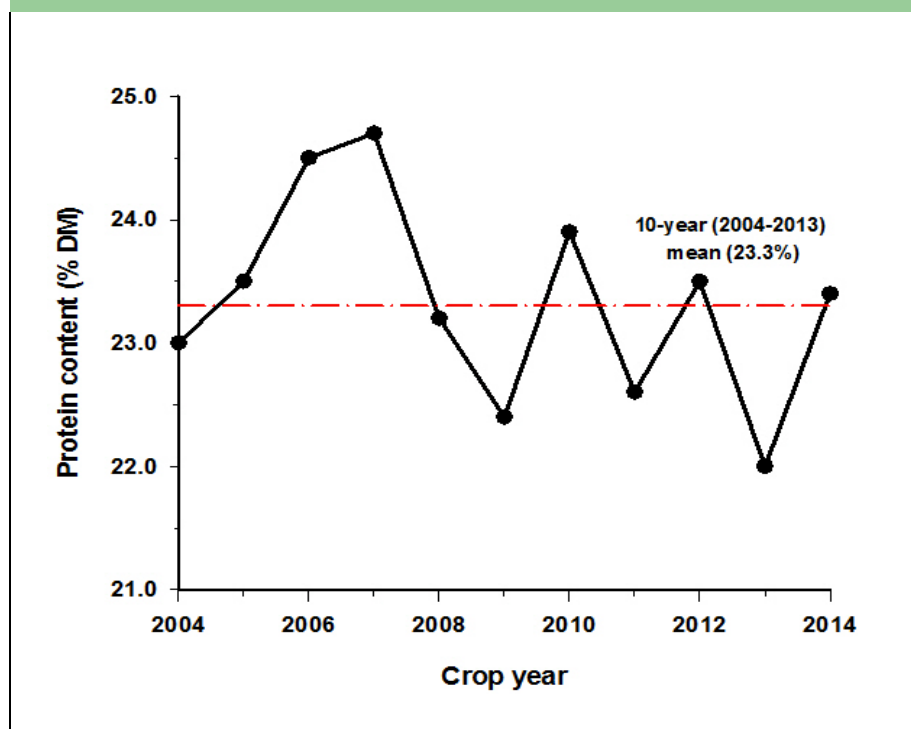
**Table 2 – Mean protein content for 2014 western Canadian peas (yellow and green combined) by grade<sup>1</sup>**

Grade	Protein content, % dry basis			
		2014		2013
	Mean	Min.	Max.	Mean
<b>Manitoba</b>				
Peas, No. 1 Canada	N/A <sup>2</sup>	N/A	N/A	20.9
Peas, No. 2 Canada	24.0	22.0	25.9	22.7
Peas, No. 3 Canada	24.0	22.1	25.9	23.9
<b>All grades</b>	<b>24.0</b>	<b>22.0</b>	<b>25.9</b>	<b>22.4</b>
<b>Saskatchewan</b>				
Peas, No. 1 Canada	23.1	19.3	26.3	21.7
Peas, No. 2 Canada	23.3	19.9	27.7	22.0
Peas, No. 3 Canada	24.2	20.5	28.1	22.7
<b>All grades</b>	<b>23.6</b>	<b>19.3</b>	<b>28.1</b>	<b>21.9</b>
<b>Alberta</b>				
Peas, No. 1 Canada	22.9	20.8	26.2	21.3
Peas, No. 2 Canada	23.0	20.2	27.5	21.8
Peas, No. 3 Canada	23.0	19.1	25.6	23.0
<b>All grades</b>	<b>23.0</b>	<b>19.1</b>	<b>27.5</b>	<b>22.0</b>
<b>Western Canada</b>				
Peas, No. 1 Canada	23.0	19.3	26.3	21.6
Peas, No. 2 Canada	23.2	19.9	27.7	22.0
Peas, No. 3 Canada	23.9	19.1	28.1	22.9
<b>All grades</b>	<b>23.4</b>	<b>19.1</b>	<b>28.1</b>	<b>22.0</b>

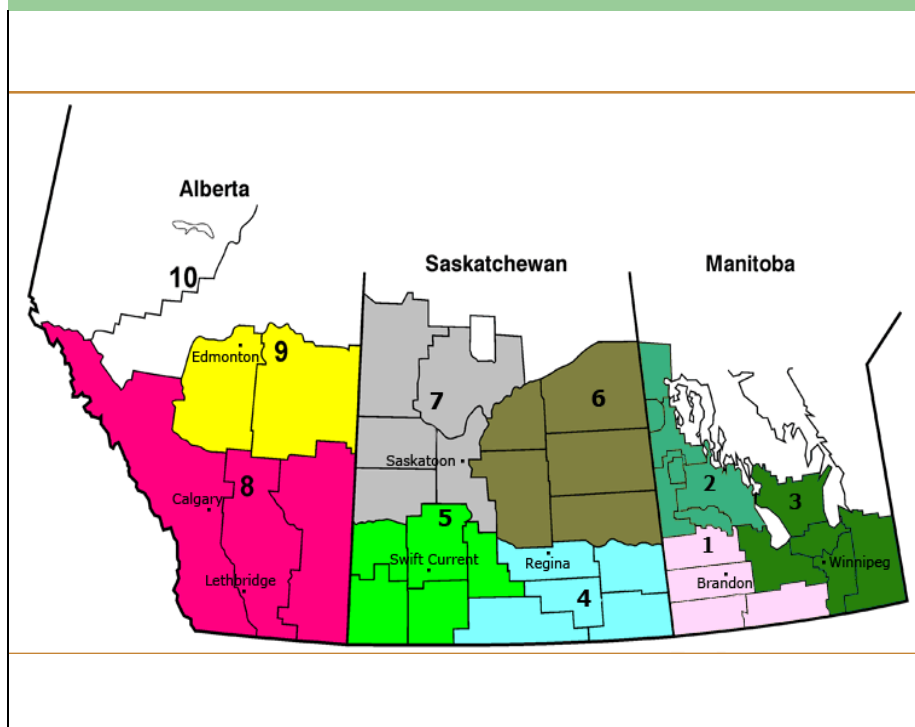
<sup>1</sup>Protein content (N x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

<sup>2</sup>N/A=Not available due to insufficient samples.

Figure 2 – Mean protein content of western Canadian peas



**Figure 3 – Crop regions in western Canada**



**Table 3 – Mean protein and starch content for 2014 western Canadian peas (yellow and green combined) by crop region**

Crop region <sup>1</sup>	Protein content, % dry basis		Starch content, % dry basis	
	2014	2013	2014	2013
3	23.3	23.3	48.4	N/A <sup>2</sup>
4	23.8	21.9	47.0	N/A
5	23.2	21.6	48.1	N/A
6	23.5	22.4	46.8	N/A
7	24.1	22.1	46.9	N/A
8	23.5	21.3	48.4	N/A
9	23.5	22.7	47.4	N/A
10	22.6	22.4	48.7	N/A

<sup>1</sup>Manitoba crop regions (Figure 3): 3 (Eastern Manitoba); Saskatchewan crop regions: 4 (South East Saskatchewan), 5 (South West Saskatchewan), 6 (North East Saskatchewan), and 7 (North West Saskatchewan); Alberta crop regions: 8 (Southern Alberta), 9 (Central Alberta), and 10 (Northern Alberta).

<sup>2</sup>N/A=Not available (analysis was not done in 2013).

**Table 4 – Quality data for 2014 western Canadian yellow pea composite by grade**

Quality parameter	Peas, No. 1 Canada Yellow		Peas, No. 2 Canada Yellow	
	2014	2013	2014	2013
<b>Chemical composition</b>				
Moisture content, %	10.7	10.9	10.6	11.1
Protein content, % dry basis	23.3	21.7	23.5	22.3
Starch content, % dry basis	47.9	47.7	48.0	47.6
Ash content, % dry basis	2.7	2.5	2.8	2.7
<b>Mineral (mg/100 g dry basis)</b>				
Calcium (Ca)	80.9	N/A <sup>1</sup>	78.1	N/A
Copper (Cu)	0.8	N/A	0.8	N/A
Iron (Fe)	5.4	N/A	5.6	N/A
Potassium (K)	916.8	N/A	1035.4	N/A
Magnesium (Mg)	134.4	N/A	131.3	N/A
Manganese (Mn)	1.2	N/A	1.3	N/A
Phosphorus (P)	331.2	N/A	344.7	N/A
Zinc (Zn)	3.8	N/A	3.8	N/A
<b>Functional property</b>				
Water hydration capacity, g H <sub>2</sub> O/g sample	0.74	0.78	0.76	0.79
Emulsifying capacity, mL oil/g sample	275.6	258.7	283.5	261.7
<b>Physical characteristic</b>				
100-seed weight, g/100 seeds	20.7	20.5	20.1	19.8
Water absorption, g H <sub>2</sub> O/g seeds	0.82	0.72	0.84	0.75
<b>Cooking characteristic</b>				
Cooking time, min	15.1	16.1	16.4	15.4
Firmness, N/g cooked seeds	23.7	23.8	22.7	22.6

<sup>1</sup>N/A=Not available (analysis was not done in 2013).

**Table 5 – Quality data for 2014 western Canadian green pea composite by grade**

Quality parameter	Peas, No. 1 Canada Green		Peas, No. 2 Canada Green	
	2014	2013	2014	2013
<b>Chemical composition</b>				
Moisture content, %	10.3	10.5	10.3	10.5
Protein content, % dry basis	23.6	22.4	23.3	23.2
Starch content, % dry basis	47.3	47.0	47.7	46.1
Ash content, % dry basis	2.8	2.7	2.9	2.7
<b>Mineral (mg/100 g dry basis)</b>				
Calcium (Ca)	67.9	N/A <sup>1</sup>	73.3	N/A
Copper (Cu)	1.1	N/A	1.0	N/A
Iron (Fe)	8.2	N/A	9.1	N/A
Potassium (K)	920.7	N/A	895.3	N/A
Magnesium (Mg)	108.4	N/A	110.0	N/A
Manganese (Mn)	1.6	N/A	1.7	N/A
Phosphorus (P)	369.1	N/A	384.1	N/A
Zinc (Zn)	3.8	N/A	4.2	N/A
<b>Functional property</b>				
Water hydration capacity, g H <sub>2</sub> O/g sample	0.76	0.79	0.79	0.78
Emulsifying capacity, mL oil/g sample	279.5	258.5	280.7	262.6
<b>Physical characteristic</b>				
100-seed weight, g/100 seeds	21.1	18.3	19.2	20.6
Water absorption, g H <sub>2</sub> O/g seeds	0.81	0.66	0.77	0.70
<b>Cooking characteristic</b>				
Cooking time, min	14.6	18.5	17.1	15.8
Firmness, N/g cooked seeds	23.3	23.1	24.9	23.5

<sup>1</sup>N/A=Not available (analysis was not done in 2013).