



Canadian Grain Commission Commission canadienne des grains

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# **Quality of** western Canadian peas

2013

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### Introduction

This report presents the quality data for the 2013 harvest survey for western Canadian peas. Samples were submitted by western Canadian producers to the Canadian Grain Commission's Grain Research Laboratory for analysis.

### **Growing and harvesting conditions**

Cool temperatures in early spring resulted in delayed planting across the Prairies until May. In some areas, planting was delayed until June due to heavy rains. Warm, windy conditions, coupled with a lack of rainfall, depleted much of the surface soil moisture in some areas of Alberta, particularly in northern, central and southern regions. However, dry conditions helped seeding progress rapidly. Most seeding was completed by early June.

The weather across western Canada was relatively consistent during the growing season. Soil moisture conditions and warm weather in June and early July favoured early crop development. Exceptions were in parts of eastern Manitoba, where there were dry conditions, and in the Peace River region, where it was dry throughout the growing season. Elsewhere, soil moisture and weather conditions were excellent throughout most of the reproductive stage in late July and early August. As a result of these conditions, the crop matured with minimal stress and there was a long grain filling period, which resulted in larger, heavier seeds.

Excellent weather conditions in late August and September advanced crop maturity and allowed harvest to progress rapidly. Dry conditions occurred in the Peace River region, northern Alberta and central Saskatchewan. Wet conditions in southern regions caused delays in harvest. However, most pea crops were in the bin by mid-October.

### **Production review**

Pea production for 2013 was estimated to be 3.8 million tonnes, which was up approximately 36% from 2012 and higher than the 10-year average (Table 1). The increase in production was the result of a 32% increase in yield from 2012. Saskatchewan accounted for 62% of Canadian pea production, while Alberta and Manitoba accounted for 36% and 2%, respectively.

Table 1 – Production statistics for western Canadian peas <sup>1</sup>								
	Harvested area		Production		Yield		Mean production	
Province	2013	2012	2013	2012	2013	2012	2003–2012	
	thousand	d hectares	thousand tonnes		kg/ha		thousand tonnes	
Peas-dry								
Manitoba	23	22	66	59	2900	2700	90	
Saskatchewan	870	911	2335	1734	2700	1900	2107	
Alberta <sup>2</sup>	411	378	1380	1037	3400	2700	710	
Western Canada	1304	1311	3781	2830	2900	2200	2906	

Statistics Canada.
Includes the Peace River area of British Columbia.

### Western Canadian peas\_\_\_\_

### 2013

#### Harvest survey samples

Samples for the Canadian Grain Commission's 2013 harvest survey were collected from producers across western Canada (Fig. 1). The Canadian Grain Commission received 395 samples consisting of 338 yellow pea and 57 green pea samples for analysis. 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 (protein, starch and ash 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.



#### **Quality of 2013 western Canadian peas**

Protein content for yellow and green peas ranged from 17.3% to 27.3% (Table 2). The mean protein content for 2013 western Canadian peas was 22.0%, which was lower than the mean of 23.5% for 2012 and the tenyear mean protein content of 23.6% (Fig. 2). Table 3 represents the mean protein content for yellow and green peas by crop region (Fig. 3).

Table 4 shows the quality data for 2013 yellow peas. Mean protein content for No. 1 Canada Yellow peas was 21.7%, which was lower than the mean for 2012 (22.7%). Mean protein content for No. 2 Canada Yellow peas was 22.3%, which was lower than the mean for 2012 (23.0%). Mean starch content for No. 1 Canada Yellow peas was 47.7%, similar to the mean for No. 2 Canada Yellow peas (47.6%). The mean starch content for both grades was slightly higher than the means for 2012. Mean ash content in both grades was similar to the 2012.

Mean water hydration capacity for No. 1 Canada Yellow peas was 0.78 g  $H_2O$  per g sample, which was lower than the mean value for 2012 (Table 4). Mean water hydration capacity for No. 2 Canada Yellow was of 0.79 g  $H_2O$  per g sample, which was also lower than the mean value for 2012. The emulsifying capacity of No. 1 Canada Yellow peas was 258.7 mL oil per g sample, which was lower than the emulsifying capacity for 2012. The emulsifying capacity of No. 2 Canada Yellow peas was 261.7 mL oil per g sample, which was also lower than the emulsifying capacity for 2012.

Mean 100-seed weight for No. 1 Canada Yellow peas was 20.5 grams (Table 4). Mean 100-seed weight for No. 2 Canada Yellow peas was 19.8 g. Mean 100-seed weights for both grades of peas were similar to the means for 2012. The water absorption value for No. 1 Canada Yellow peas was  $0.72 \text{ g H}_2\text{O}$  per g seeds. For No. 2 Canada Yellow peas, the water absorption value was  $0.75 \text{ g H}_2\text{O}$  per g seeds. Water absorption values for both grades were lower than 2012 values.

Cooking times for No. 1 and No. 2 Canada Yellow peas were slightly longer (16.1 min and 15.4 min, respectively) than in 2012 (Table 4). For both No. 1 and No. 2 grades, mean firmness values of cooked peas were similar to values in 2012.

Table 5 shows the quality data for No. 1 Canada and No. 2 Canada Green peas. Mean protein content for No. 1 Canada Green peas was 22.4%, which was lower than the mean for 2012. Mean protein content for No. 2 Canada Green peas was 23.2%, which was similar to the mean for 2012. Mean starch content was 47.0% for No. 1 Canada Green peas and 46.1% for No. 2 Canada Green peas. The means were slightly higher than the means for 2012. Ash content values for No. 1 and No. 2 Canada Green peas were similar to values in 2012.

Mean water hydration capacity for No. 1 Canada Green peas (0.79 g  $H_2O$  per g sample) was similar to the mean for No. 2 Canada Green peas (0.78 g  $H_2O$  per g sample) (Table 5).The means for both grades were lower than the means for 2012. Mean emulsifying capacity was 258.5 mL oil per g sample for No. 1 Canada Green peas and 262.6 mL oil per g sample for No. 2 Canada Green peas. The means were lower than the 2012 means.

Mean 100-seed weight for No. 1 Canada Green peas was 18.3 g and was 20.6 g for No. 2 Canada Green peas, similar to the mean seed weights for 2012 (Table 5). Mean water absorption values for No. 1 and No. 2 Canada Green peas were lower than the mean values for 2012. Mean cooking time for No. 1 Canada Green peas was 18.5 min and was 15.8 min for No. 2 Canada Green peas. Mean cooking times were longer than those for 2012. Mean firmness values for cooked green peas for both grades were slightly higher than values for 2012.

	Protein content, % dry basis			
Grade		2013		2012
	mean	min.	max.	mean
Manitoba				
Peas, No. 1 Canada	20.9	20.7	21.1	23.9
Peas, No. 2 Canada	22.7	20.0	24.5	23.7
Peas, No. 3 Canada	23.9	22.7	25.2	24.1
All grades	22.4	20.0	25.2	23.8
Saskatchewan				
Peas, No. 1 Canada	21.7	17.3	25.8	23.4
Peas, No. 2 Canada	22.0	18.4	25.3	23.7
Peas, No. 3 Canada	22.7	19.1	26.3	24.2
All grades	21.9	17.3	26.3	23.8
Alberta				
Peas, No. 1 Canada	21.3	17.3	25.8	22.6
Peas, No. 2 Canada	21.8	18.7	25.5	22.7
Peas, No. 3 Canada	23.0	18.7	27.3	23.8
All grades	22.0	17.9	27.3	23.1
Western Canada				
Peas, No. 1 Canada	21.6	17.3	25.8	23.1
Peas, No. 2 Canada	22.0	18.4	25.5	23.3
Peas, No. 3 Canada	22.9	18.7	27.3	24.1
All grades	22.0	17.3	27.3	23.5

## Table 2 – Mean protein content for 2013 western Canadian peas (yellow and green combined) by $grade^1$

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



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



	Protein content, % dry basis				
Crop region <sup>1</sup>		2012			
	Mean	Range	Mean		
1	21.4	19.8 – 24.5	23.5		
2	N/A	N/A	22.7		
3	23.3	20.8 - 24.4	25.6		
4	21.9	19.1 – 26.3	24.1		
5	21.6	17.3 – 24.4	23.8		
6	22.4	20.2 – 25.3	23.3		
7	22.1	18.9 – 25.4	23.8		
8	21.3	17.9 – 25.5	23.2		
9	22.7	19.7 – 27.3	23.3		
10	22.4	18.7 – 25.5	23.2		

Table 3 – Mean protein content for 2013 western Canadian peas (yellow and green combined) by crop region

<sup>1</sup> Manitoba crop regions: 1 (South West Manitoba), 2 (North West Manitoba), and 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).

	Peas, No. 1 Canada Yellow		Peas, No. 2 C	Canada Yellow
Quality parameter	2013	2012	2013	2012
Chemical composition				
Protein content, % dry basis	21.7	22.7	22.3	23.0
Starch content, % dry basis	47.7	47.3	47.6	47.3
Ash content, % dry basis	2.5	2.6	2.7	2.7
Functional property				
Water hydration capacity, g $H_2O/g$ sample	0.78	0.85	0.79	0.85
Emulsifying capacity, mL oil/g sample	258.7	289.6	261.7	289.3
Physical characteristic				
100-seed weight, g/100 seeds	20.5	20.0	19.8	19.4
Water absorption, g $H_2O/g$ seeds	0.72	0.93	0.75	0.94
Cooking characteristic				
Cooking time, min	16.1	13.0	15.4	11.0
Firmness, N/g cooked seeds	23.8	23.1	22.6	22.9

#### Table 4 – Quality data for 2013 western Canadian yellow pea composite by grade

	Peas, No. 1 Canada Green		Peas, No. 2	Canada Green
Quality parameter	2013	2012	2013	2012
Chemical composition				
Protein content, % dry basis	22.4	23.0	23.2	23.5
Starch content, % dry basis	47.0	46.0	46.1	45.7
Ash content, % dry basis	2.7	2.9	2.7	2.8
Functional property				
Water hydration capacity, g $H_2O/g$ sample	0.79	0.88	0.78	0.86
Emulsifying capacity, mL oil/g sample	258.5	289.7	262.6	286.3
Physical characteristic				
100-seed weight, g/100 seeds	18.3	18.4	20.6	20.6
Water absorption, g $H_2O/g$ seeds	0.66	0.99	0.70	0.94
Cooking characteristic				
Cooking time, min	18.5	11.1	15.8	13.0
Firmness, N/g cooked seeds	23.1	22.1	23.5	22.6

#### Table 5 – Quality data for 2013 western Canadian green pea composite by grade