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Quality of western Canadian pulse crops 2004

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Introduction

This report presents the quality data of the 2004 harvest survey for western Canadian pulse crops (peas, lentils, chickpeas and pea beans). Pulse samples submitted by western Canadian producers to the Canadian Grain Commission's (CGC) Grain Research Laboratory (GRL) were collected for data analysis.

Summary

Pulse crops (peas, lentils and white pea beans) in 2004 harvest survey showed bigger seed sizes compared to last year. The average protein contents for 2004 peas and white pea beans were slightly higher than for 2003 but lentils and chickpeas in 2004 had similar mean protein contents to 2003 (Table 1). Yellow and green peas exhibited slightly lower water absorption, longer cooking time but softer texture when cooked compared to last year. Lentils showed lower water absorption values compared to 2003 survey. Pea beans in 2004 had lower water absorption, shorter cooking time and softer in texture than in 2003. The wet harvest and the early frost in August in many areas of the Prairies in 2004 affected the quality of chickpeas. As a result, the CGC did not receive a sufficient number of chickpea samples to include their results, except for protein content, in the 2004 harvest survey.

Weather review

The weather review for the 2004 crop year was provided by the Weather and Crop Surveillance department of the Canadian Wheat Board (CWB).

Seeding

Extremely low soil moisture levels were present in Alberta and Saskatchewan at the beginning of the 2004 growing season. The dry soils delayed fieldwork in many areas of both provinces, until significant precipitation arrived in May. Planting of pulse crops began in early May across the Prairies and advanced rapidly in the western growing areas. Cool temperatures and frequent frosts in the eastern growing area of Saskatchewan and Manitoba slowed planting. General rains and snow in the third week of May slowed planting but provided much needed moisture for germination. The cool temperatures and frequent rains persisted in eastern areas well into June, resulting in late planting of some pulse crops. Seeding was completed by mid-June, although some fields were not planted due to the wet conditions in parts of Manitoba and eastern Saskatchewan.

Growing conditions

Cool, wet weather persisted through the month of June in the eastern Prairies, which delayed crop growth. The period was one of the coolest on record in the eastern Prairies. Although western areas of the Prairies were warmer, below normal temperatures were also reported in Alberta and western Saskatchewan. Crop development was generally two to three weeks behind normal in the eastern Prairies by the end of June, while crops in the west were only one week behind normal. Temperatures improved in the month of July, allowing crops to develop rapidly. Western growing areas received the warmest temperatures, with most locations having normal or slightly above normal temperatures for the month. Temperatures also improved in eastern areas, but this region still reported below normal temperatures. Rainfall during July was close to normal across the Prairies, which encouraged good crop growth. Yield potential for most crops was above average due to the adequate rainfall and lack of heat stress. Temperatures in August returned to dramatically below normal levels, further delaying crop development. Freezing temperatures during the third week of August caused significant damage to immature crops in parts of Saskatchewan and Manitoba. The cool temperatures persisted into September, resulting in delayed maturity of most crops. Growing season temperatures (May through August) during the 2004 season were among the coolest reported in over 100 years.

Harvest conditions

Persistent rains in late August and early September delayed harvest progress across the Prairie region. Only five per cent of the harvest was completed by the first week of September. The rains caused quality damage to pulse crops, especially in northern areas of the Prairies. Drier and milder weather in late September and early October resulted in rapid harvest progress. Over 50 per cent of the crop was harvested by the first week in October and over 80 per cent was completed by the middle of the month.

Production review

Production for peas and lentils increased in 2004, despite the wet weather and the early frost in August in many areas of the Prairies. On the other hand, frost and wet weather affected the harvest and production of white pea beans in Manitoba and chickpeas in Saskatchewan.

Pea production for 2004 was estimated at 3.3 million tonnes, which was 57% higher than the 2.1 million tonnes production in 2003 and 74% higher than the 10-year average of 1.9 million tonnes (Table 2). The increase in production is due to increases in both harvested area and yield. In 2004, Saskatchewan accounted for 74% of Canadian pea production, Alberta for 21%, and Manitoba for 5%.

Production of lentils in 2004 increased by 84% from 0.52 million tonnes in 2003 to 0.96 million tonnes. This was due to increases in both harvested area and yield

(Table 2). The production was 83% higher than the 10-year average. Saskatchewan continues to dominate lentil production in Western Canada, accounting for more than 99% of production.

In 2004, Manitoba accounted for 100% of western Canadian white pea bean production. Production of western Canadian white pea beans in 2004 decreased 14% as compared to that in 2003 but was 31% higher than the 10-year average (Table 2). Harvested area decreased by 9% to 41 thousand hectares in 2004 from 45 thousand hectares in 2003. Yield decreased by 16% from 1.9 tonnes per hectare in 2003 to 1.6 tonnes per hectare in 2004.

Production of chickpeas for 2004 was estimated at 51 thousand tonnes. This was 80% lower than the 5-year average of 0.25 million tonnes and 25% below 2003 production (Table 2). The decreased production was due to the reduction in harvested area. Yield for 2004 was 1.3 tonnes per hectare, which was higher than that for 2003. Saskatchewan accounted for approximately 84% of western Canadian chickpea production in 2004 and Alberta for 16%.

Table 1a – Canada western pulse crops quality data for 2004 harvest survey

Quality parameter	Mean for No. 1 Canada 2004	2003	1999-2003
Peas			
Protein content, %	23.1	24.4	24.2
Peas, No. 1 Canada Yellow			
100-seed weight, g/100 seeds	24.7	21.0	22.9
Water absorption, g H_2O/g seeds	0.95	1.01	0.96
Cooking time, min	24.5	19.9	19.9
Hardness (cookability), kg/g cooked seeds	8.9	10.1	9.6
Peas, No. 1 Canada Green			
100-seed weight, g/100 seeds	23.1	19.7	21.0
Water absorption, g H_2O/g seeds	0.93	1.06	0.99
Cooking time, min	20.3	18.4	18.4
Hardness (cookability), kg/g cooked seeds	7.2	10.8	10.1
Lentils[1]			
Protein content, %	26.1	26.7	26.1
Lentils, No. 1 Canada Green Small [3]			
100-seed weight, g/100 seeds	3.6	3.4	3.4
Water absorption, g H_2O/g seeds	0.69	0.88	0.83
Mean seed size[2], mm	4.9	4.5	5.0
Lentils, No. 1 Canada Green Medium [4]			
100-seed weight, g/100 seeds	5.4	5.1	5.0
Water absorption, g H_2O/g seeds	0.78	0.98	0.91
Mean seed size[2], mm	6.0	5.7	5.7
Lentils, No. 1 Canada Green Large[5]			
100-seed weight, g/100 seeds	7.3	6.4	6.8
Water absorption, g H_2O/g seeds	0.86	1.02	0.96
Mean seed size[2], mm	6.8	6.1	6.2
Lentils, No. 1 Canada Red[6]			
100-seed weight, g/100 seeds	3.6	2.9	3.2
Water absorption, g H_2O/g seeds	0.81	0.95	0.93
Mean seed size[2], mm	4.8	4.5	5.1

[1] Lentils, No. 1 Canada and Lentils, No. 2 Canada combined.
[2] Seed size determined by the Image Analysis technique.
[3] Small lentils including the varieties Eston and Milestone.
[4] Medium lentils including the varieties Richlea and Vantage.
[5] Large lentils including the varieties Laird, Glamis, Sovereign and Grandora.
[6] Red lentils including the varieties Blaze, Crimson, Robin, Redcap and Redwing.

Table 1b – Canada western pulse crops quality data for 2004 harvest survey

Quality parameter	Mean for No. 1 Canada 2004	2003	1999-2003
Pea beans, No. 1 Canada White			
Protein content, %	24.6	26.2	25.0
100-seed weight, g/100 seeds	17.5	16.6	19.1
Water absorption, g H_2O/g seeds	0.82	0.97	0.90
Cooking time, min	16.2	23.9	23.9
Hardness (cookability), kg/g cooked seeds	10.9	15.8	15.8
Chick peas, No. 1 Canada Western Kabuli			
Protein content, %	23.9	23.3	23.9
100-seed weight, g/100 seeds	NA	30.6	39.0
Water absorption, g H_2O/g seeds	NA	1.15	1.07

NA=not available due to a small number of samples.

Table 2 – Production statistics for western Canadian pulses[1]

Province	Harvested area 2004	Harvested area 2003	Production 2004	Production 2003	Yield 2004	Yield 2003	Mean production[2] 1994-2003
	thousand hectares		thousand tonnes		kg/ha		thousand tonnes
Peas - dry							
Manitoba	59	55	160	137	2730	2520	159
Saskatchewan	1020	967	2477	1470	2430	1520	1287
Alberta[3]	267	249	702	517	2644	2076	450
Western Canada	**1346**	**1271**	**3340**	**2124**	**2481**	**1670**	**1897**
Lentils							
Manitoba	2.0	1.6	0.8	2.7	400	1700	14
Saskatchewan	741	528	949	510	1280	970	500
Alberta[3]	7.2	6.0	11.3	6.9	1570	1150	10
Western Canada	**750**	**536**	**961**	**520**	**1280**	**970**	**524**
Pea beans							
Manitoba	41	45	20	84	910	1890	55
Saskatchewan	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alberta[3]	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western Canada	**41**	**45**	**72**	**84**	**1550**	**1890**	**55**
Chick peas							
Manitoba	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saskatchewan	32.4	53	43	54	1310	1040	240[4]
Alberta[3]	6.1	10	8.6	13	1410	1310	12[4]
Western Canada	**38.5**	**63**	**51.2**	**68**	**1330**	**1080**	**252[4]**

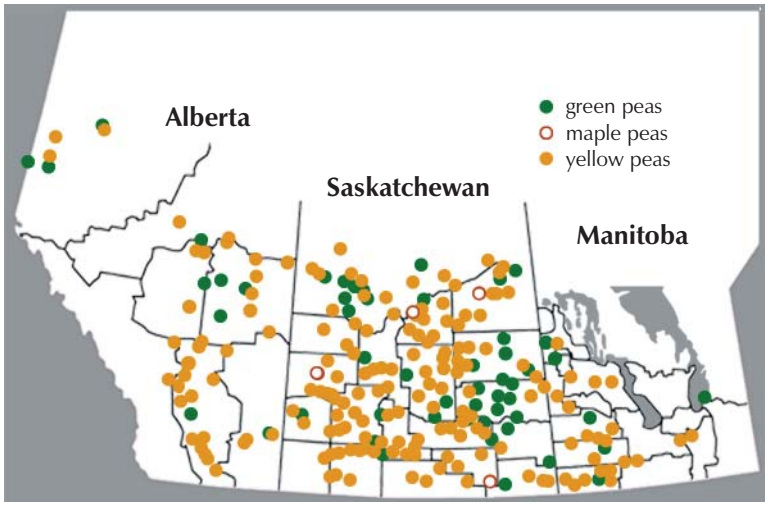
1 Statistics Canada, *Field Crop Reporting Series, Vol. 83, No. 8.*
2 Statistics Canada, F*ield Crop Reporting Series, 1994-2003.*
3 Includes the Peace River area of British Columbia.
4 Statistics Canada, *Field Crop Reporting Series, 1999-2003*.

Quality of western Canadian peas 2004

Harvest survey samples

Samples for the CGC's 2004 harvest survey were collected from producers across western Canada (Fig. 1). A total of 908 samples consisting of 661 yellow pea, 235 green pea, and 12 maple pea samples, were received at the CGC for analysis. All samples were graded and tested for protein content. Only those samples receiving a grade of Peas, No. 1 Canada or Peas, No. 2 Canada were tested for 100-seed weight, water absorption, cooking time and firmness of cooked peas (cookability). 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 2004 harvest survey pea samples



Quality of 2004 western Canadian peas

The average protein content for 2004 western Canadian peas was 23.0% (Table 3). This was slightly lower than that for 2003 and the five-year average of 24.0% (Fig. 2). The mean protein content did not change significantly between grades.

Peas, No. 1 Canada Yellow and Peas, No. 2 Canada Yellow had a mean 100-seed weight of 24.7 g and 24.3 g (Table 4), respectively. These values were higher than those for Peas, No. 1 Canada Yellow and Peas, No. 2 Canada Yellow for 2003. The mean water absorption values for 2004 Peas, No. 1 Canada Yellow and Peas, No. 2 Canada Yellow

were about 0.90 (g H_2O/g seeds), which were slightly lower than those for 2003. Grade appeared to have a little effect on the mean seed weight and water absorption values.

Cooking time was determined using an automated Mattson cooker device developed at the CGC. The mean cooking times for Peas, No. 1 Canada Yellow and Peas, No. 2 Canada Yellow were 24.5 and 24.4 min, respectively. 2004 peas had slightly longer cooking time than 2003.

At a fixed cooking time, the force required to compress a cooked pea sample measured using a texture analyzer is related to the firmness of cooked seeds. The mean firmness values of cooked Peas, No. 1 Canada Yellow and Peas, No. 2 Canada Yellow for 2004 were 8.9 and 8.9 kg/g cooked seeds, respectively (Table 4). These were slightly lower than the respective grades in 2003.

Samples of peas graded Peas, No. 1 Canada Green and Peas, No. 2 Canada Green had similar mean 100-seed weight (Table 5). The seed weight for 2004 green pea samples was higher than that for 2003. The mean water absorption values for Peas, No. 1 Canada Green and Peas, No. 2 Canada Green were slightly lower than 2003. 2004 green peas had slightly longer cooking time but lower firmness values than 2003. There were no differences in the mean cooking time and firmness values between samples graded Peas, No. 1 Canada Green and Peas, No. 2 Canada Green.

Table 3 – Mean protein content for 2004 western Canadian peas by grade[1]

	Protein content		
Grade	2004	2003	1999-2003
	%	%	%
Peas, No. 1 Canada	23.1	24.4	24.0
Peas, No. 2 Canada	22.9	24.2	23.9
Peas, No. 3 Canada	22.9	24.0	24.0
All grades	23.0	24.3	24.0

[1] Protein content (N x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

Figure 2 – Mean protein content of western Canadian peas

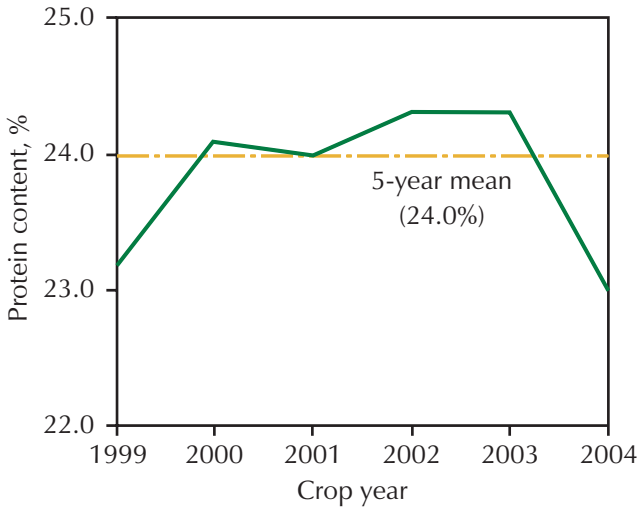


Table 4 – Quality data for 2004 western Canadian yellow peas

	Peas, No. 1 Canada Yellow		Peas, No. 2 Canada Yellow	
Quality parameter	2004	2003	2004	2003
100-seed weight, g/100 seeds				
Number of samples	109	172	330	174
Mean	24.7	21.0	24.3	20.9
Standard deviation	2.7	2.2	2.9	2.8
Minimum	18.6	14.7	12.0	12.3
Maximum	33.4	29.8	33.4	29.3
Water absorption, g H_2O/g seeds				
Number of samples	109	172	330	174
Mean	0.90	1.01	0.92	1.01
Standard deviation	0.11	0.10	0.12	0.09
Minimum	0.61	0.51	0.41	0.68
Maximum	1.14	1.16	1.26	1.17
Cooking time, min				
Number of samples	42	29	79	15
Mean	24.5	19.9	24.4	22.8
Standard deviation	9.1	9.0	9.1	5.2
Minimum	9.9	7.7	7.8	15.7
Maximum	37.8	41.4	38.6	30.8
Hardness (cookability), kg/g cooked seeds				
Number of samples	83	169	264	174
Mean	8.9	10.1	8.9	9.6
Standard deviation	2.2	2.9	2.5	2.7
Minimum	4.7	4.7	3.7	4.3
Maximum	14.4	18.1	16.7	18.9

Table 5 – Quality data for 2004 western Canadian green peas

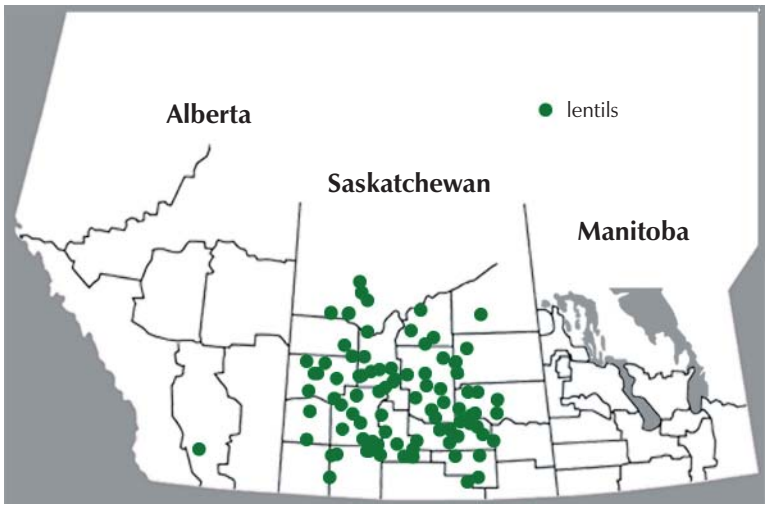
	Peas, No. 1 Canada Green		Peas, No. 2 Canada Green	
Quality parameter	2004	2003	2004	2003
100-seed weight, g/100 seeds				
Number of samples	14	39	58	46
Mean	23.1	19.7	22.5	19.6
Standard deviation	4.4	3.1	2.7	2.6
Minimum	17.3	14.5	16.1	15.9
Maximum	29.6	25.3	28.0	26.6
Water absorption, g H_2O/g seeds				
Number of samples	14	39	58	46
Mean	0.93	1.06	0.92	1.05
Standard deviation	0.11	0.09	0.17	0.13
Minimum	0.72	0.85	0.27	0.45
Maximum	1.07	1.27	1.15	1.23
Cooking time, min				
Number of samples	11	11	41	16
Mean	20.3	18.4	22.3	19.3
Standard deviation	8.3	5.9	8.7	7.2
Minimum	7.9	9.9	10.2	9.1
Maximum	32.2	27.0	38.4	32.8
Hardness (cookability), kg/g cooked seeds				
Number of samples	17	39	55	46
Mean	7.2	10.8	8.4	10.4
Standard deviation	1.7	2.6	2.6	2.6
Minimum	4.0	5.7	3.8	6.1
Maximum	10.3	16.9	14.3	17.8

Quality of western Canadian lentils 2004

Harvest survey samples

Samples for the CGC's 2003 harvest survey were collected from producers across western Canada (Fig. 3). A total of 332 lentil samples were received at the CGC for analysis. All samples were graded and tested for protein content. In addition, seed size distribution was measured by the Image Analysis technique. Only those samples receiving a grade of Lentils, No. 1 Canada or Lentils, No. 2 Canada were tested for 100-seed weight and water absorption. It is important to note that the samples reported by grade do not necessarily represent the actual distribution of grade.

Figure 3 – Map of western Canada showing origin of 2004 harvest survey samples of lentils



Quality of 2004 western Canadian lentils

The average protein content for 2004 western Canadian lentils was 26.4% (Table 6). This was similar to that for 2003 and the five-year average of 26.5% (Fig. 4).

Green lentils are often classified into large, medium and small based on seed size. Small size green lentils, including the varieties Eston and Milestone, had a mean 100-seed weight of 3.6 g (Table 7). Medium size green lentils (Richlea and Vantage) had an average 100-seed weight of 5.4 g. Large size green lentils, including the varieties Laird, Glamis, Sovereign, Sedley and Grandora, had a mean 100-seed weight of 7.3 g. Large green lentils in the 2004 survey had higher seed weight than in the 2003 survey,

but small and medium green lentils had similar seed weight to 2003. The mean water absorption values for 2004 were lower than for 2003.

The seed size distribution for green lentils (Table 8) was determined by the Image Analysis technique developed at the CGC. The reported results may differ from those obtained by the conventional sieving techniques. For small green lentils in 2004, 68% fell within 4.5 to 5.5 mm, which was similar to 2003. In 2004, 69% of medium size lentils fell in the range of 5.5-7.0 mm while in 2003, 88% were in this range. In 2004 survey 65% of large lentils were within the range of 6.0 to 7.5 mm as compared to 74% in the 2003 survey.

Red lentils, including the varieties Blaze, Crimson, Redwing, Redcap and Robin, had a mean 100-seed weight of 3.6 g (Table 9), which was higher than in 2003. The mean water absorption value for 2004 was lower than for 2003.

In 2004, 92% of the red lentils fell within 4.0 to 5.5 mm compared to 85% in 2003 (Table 10). This indicated that red lentils in 2004 had bigger seed sizes than in 2003.

Table 6 – Protein content for 2004 western Canadian lentils by grade[1]

	Protein content		
Grade	2004	2003	1999-2003
	%	%	%
Lentils, No. 1 Canada	26.2	26.7	26.2
Lentils, No. 2 Canada	25.9	26.7	26.6
Lentils, No. 3 Canada	27.0	26.6	26.8
All grades	26.4	26.7	26.5

[1] Protein content (N x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

Figure 4 – Mean protein content of western Canadian lentils

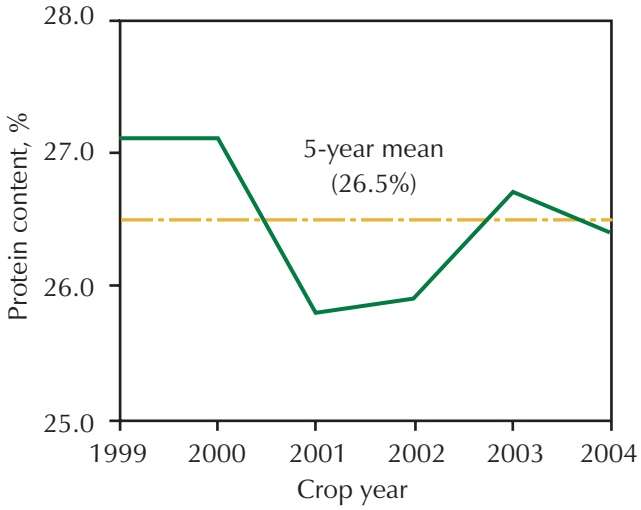


Table 7 – Quality data for 2004 western Canadian green lentils by size[1]

	2004			2003		
	SL[2]	ML[3]	LL[4]	SL[2]	ML[3]	LL[4]
	Number of samples			Number of samples		
Quality parameter	15	6	103	22	17	151
100-seed weight, g/100 seeds						
Mean	3.6	5.4	7.3	3.4	5.1	6.4
Standard deviation	0.4	0.4	0.7	0.2	0.3	0.6
Minimum	3.0	4.7	5.6	2.9	4.6	4.6
Maximum	4.1	5.8	8.9	3.7	5.9	7.8
Water absorption, g H_2O/g seeds						
Mean	0.69	0.78	0.86	0.88	0.98	1.02
Standard deviation	0.19	0.97	0.14	0.09	0.04	0.09
Minimum	0.37	0.48	0.52	0.71	0.90	0.37
Maximum	0.98	1.05	1.10	1.05	1.05	1.20

[1] Lentils, No. 1 Canada Green and Lentils, No. 2 Canada Green combined.
[2] SL – Small lentils including the varieties Eston and Milestone.
[3] ML – Medium lentils including the varieties Richlea and Vantage.
[4] LL – Large lentils including the varieties Laird, Glamis, Sovereign and Grandora.

Table 8 – Seed size distribution for 2004 western Canadian green lentils[1]

	2004			2003		
	SL[2]	ML[3]	LL[4]	SL[2]	ML[3]	LL[4]
	Number of samples			Number of samples		
Seed size distribution	31	14	245	23	14	132
3.5-4.0 mm, %	1.3	0.0	0.0	0.9	0.0	0.0
4.0-4.5 mm, %	19.8	2.3	0.1	15.0	0.0	0.0
4.5-5.0 mm, %	35.2	7.5	0.8	36.2	0.1	0.1
5.0-5.5 mm, %	32.3	13.2	6.3	32.7	6.6	3.0
5.5-6.0 mm, %	8.4	21.6	11.0	13.4	31.3	14.5
6.0-7.0 mm, %	1.9	47.8	38.2	1.8	56.8	51.8
7.0-7.5 mm, %	0.8	6.6	26.6	0.0	4.7	21.9
>7.5 mm, %	0.4	0.9	16.3	0.0	0.4	8.7

[1] Seed size determined by an Image Analysis technique.
[2] SL – Small lentils including the varieties Eston and Milestone.
[3] ML – Medium lentils including the varieties Richlea and Vantage.
[4] LL – Large lentils including the varieties Laird, Glamis, Sovereign and Grandora.

Table 9 – Quality data for 2004 western Canadian red lentils[1]

	2004	2003
	Number of samples	
Quality parameter	16	25
100-seed weight, g/100 seeds		
Mean	3.6	2.9
Standard deviation	0.5	0.4
Minimum	2.6	2.1
Maximum	4.1	3.5
Water absorption, g H_2O/g seeds		
Mean	0.81	0.95
Standard deviation	0.08	0.11
Minimum	0.65	0.72
Maximum	0.97	1.25

[1] Red lentils (Blaze, Crimson, Robin, Redcap and Redwing). Lentils, No. 1 Canada Red and Lentils, No. 2 Canada Red combined.

Table 10 – Seed size distribution for 2004 western Canadian red lentils[1]

	2004	2003
	Number of samples	
Seed size distribution[2]	30	25
3.5-4.0 mm, %	1.3	0.7
4.0-4.5 mm, %	25.8	13.3
4.5-5.0 mm, %	34.5	38.3
5.0-5.5 mm, %	31.7	33.8
5.5-6.0 mm, %	6.5	12.6
6.0-7.0 mm, %	0.3	1.3
>7.0 mm, %	0.0	0.0

[1] Red lentils including the varieties Blaze, Crimson, Robin, Redcap and Redwing.
[2] Seed size determined by the Image Analysis technique.

Quality of western Canadian pea beans 2004

Harvest survey samples

Samples for the Canadian Grain Commission harvest survey were collected from producers across Manitoba, Canada (Fig. 5). For the 2004 harvest survey, only 38 pea bean samples from Manitoba were received at the Canadian Grain Commission for analysis due to the wet weather and the early frost in August. All samples were graded and analyzed for protein content. Only those samples receiving a grade of Pea beans, No. 1 Canada; Pea beans, Canada No. 1 Select; Pea beans, Extra Canada No. 1 or Pea beans, No. 2 Canada were tested for 100-seed weight, water absorption, cooking time and firmness of cooked beans. It is important to note that the samples reported by grade do not necessarily represent the actual distribution of grade.

Figure 5 – Map of western Canada showing origin of 2004 harvest survey western Canadian pea bean samples

Quality of 2004 western Canadian pea beans

The average protein content for 2004 was 25.2% (Table 11). This was slightly lower than that for 2003, but was close to the four-year average (Fig. 6). It seemed that grade had a little effect on the mean protein content.

The average seed weight for Pea beans, No. 1 Canada grade in 2004 was slightly higher than that in 2003 (Table 12). Samples graded Pea beans, No. 2 Canada had a similar mean seed weight to those in 2003 (Table 12). The average water absorption values for 2004 Pea beans, No. 1 Canada and Pea beans, No. 2 Canada were lower than the respective grades in 2003.

Cooking time was determined using an automated Mattson cooker device developed at the CGC. Pea beans, No. 1 Canada and Pea beans, No. 2 Canada had shorter mean cooking times and softer texture than the respective grades in 2003.

Table 11 – Mean protein content for 2004 western Canadian pea beans[1]

	Protein content		
Grade	2004	2003	2001-2003
	%	%	%
Pea beans, Extra No. 1 Canada	–	25.9	25.1
Pea beans, Canada No. 1 Select	24.5	26.1	25.2
Pea beans, No. 1 Canada	24.6	26.2	25.1
Pea beans, No. 2 Canada	26.2	26.3	25.5
Pea beans, No. 3 Canada	25.1	27.0	26.0
Pea beans, No. 4 Canada	25.8	27.8	25.9
All grades	25.2	26.5	25.5

[1] Protein content (N x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

Figure 6 – Mean protein content of western Canadian pea beans

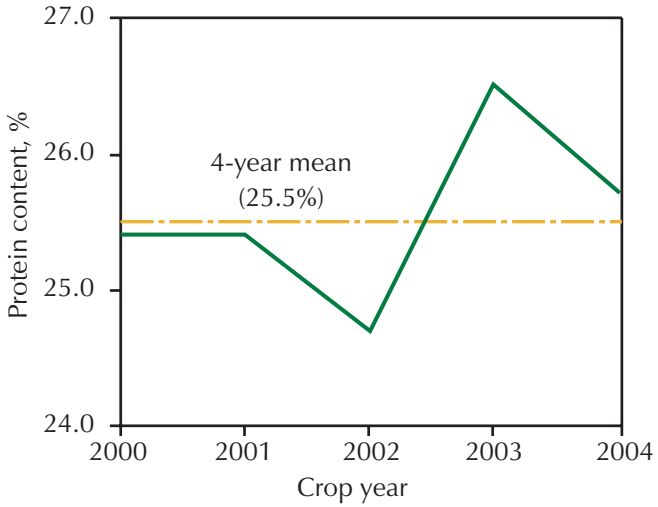


Table 12 – Quality data for 2004 western Canadian pea beans

	Pea beans, No. 1 Canada[1]		Pea beans, No. 2 Canada	
Quality parameter	2004	2003	2004	2003
100-seed weight, g/100 seeds				
Number of samples	14	45	12	5
Mean	17.5	16.6	17.3	17.6
Standard deviation	1.5	1.3	1.1	2.9
Minimum	14.4	14.0	14.9	15.0
Maximum	19.9	20.8	18.9	21.1
Water absorption, g H_2O/g seeds				
Number of samples	14	45	12	5
Mean	0.82	0.97	0.82	0.95
Standard deviation	0.13	0.06	0.16	0.09
Minimum	0.54	0.82	0.49	0.82
Maximum	1.01	1.12	1.03	1.07
Cooking time, min				
Number of samples	14	45	12	5
Mean	16.2	23.9	12.9	24.3
Standard deviation	4.4	3.6	1.2	2.7
Minimum	11.5	16.5	10.6	20.8
Maximum	29.5	32.1	14.7	27.4
Hardness (cookability), kg/g cooked seeds				
Number of samples	14	45	12	5
Mean	10.9	15.8	9.2	15.6
Standard deviation	1.7	3.1	2.4	2.0
Minimum	8.8	8.0	5.8	13.8
Maximum	14.4	22.8	13.4	19.0

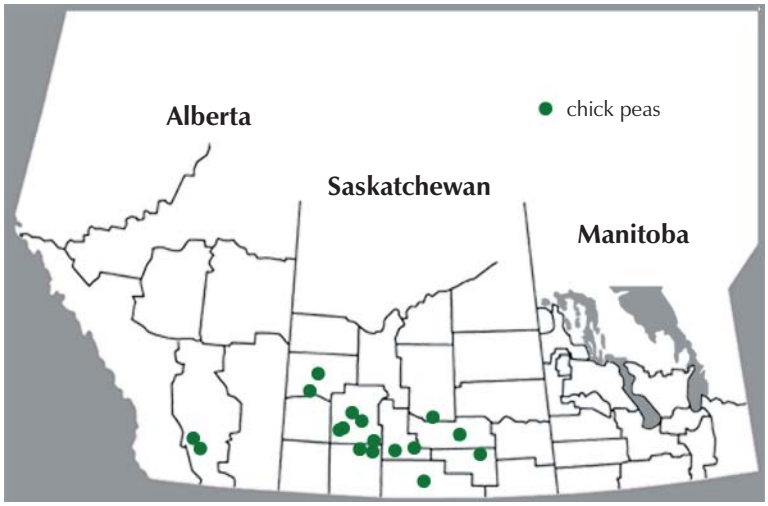
[1] Including Pea beans, Extra No. 1 Canada, and Pea beans, Canada No. 1 Select.

Quality of western Canadian chick peas 2004

Harvest survey samples

Samples for the CGC harvest survey were collected from producers across western Canada (Fig. 7). For the 2004 harvest survey, 21 chick pea samples were received at the CGC for analysis. All samples were graded and analyzed for protein content. Due to the small number of samples received, results for chick peas, except for protein content, were not included in the 2004 quality report. It is important to note that the samples reported by grade do not necessarily represent the actual distribution of grade.

Figure 7 – Map of western Canada showing origin of 2004 harvest survey chick pea samples



Quality of 2004 western Canadian chick pea

The average protein content for 2004 chick peas was 21.0% (Table 13). This was lower than that for 2003 and the four-year average of 23.1% (Fig. 8).

Table 13 – Mean protein content for 2004 western Canadian Kabuli chick peas by grade[1]

	Protein content		
Grade	2004	2003	2000-2003
	%	%	%
Chick peas, Kabuli, Canada Western No. 1	23.9	23.3	23.9
Chick peas, Kabuli, Canada Western No. 2	20.9	23.9	23.0
Chick peas, Kabuli, Canada Western No. 3	20.7	23.4	22.4
All grades	21.0	23.6	23.1

[1] Protein content (N x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

Figure 8 – Mean protein content of western Canadian Kabuli chick peas

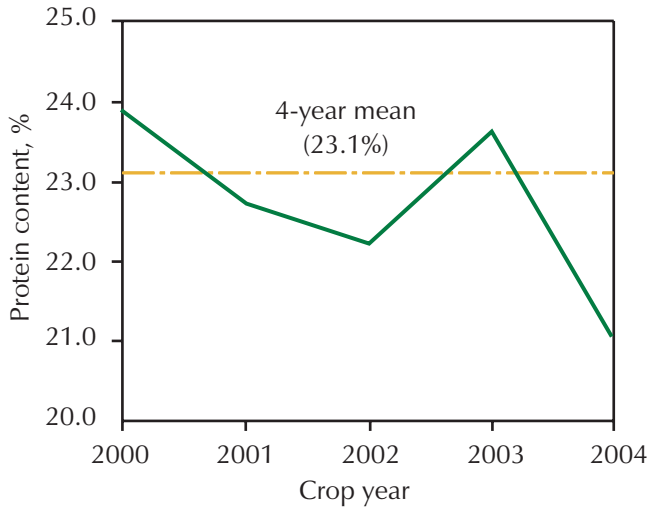


Table 14 – Quality data for 2004 western Canadian Kabuli chick peas

	Chick peas, Kabuli, No. 1 Canada Western		Chick peas, Kabuli, No. 2 Canada Western	
Quality parameter	2004	2003	2004	2003
100-seed weight, g/100 seeds				
Number of samples	NA	10	NA	7
Mean	NA	30.6	NA	35.9
Standard deviation	NA	10.3	NA	10.2
Minimum	NA	21.9	NA	23.6
Maximum	NA	49.2	NA	46.4
Water absorption, g H_2O/g seeds				
Number of samples	NA	10	NA	7
Mean	NA	1.15	NA	1.14
Standard deviation	NA	0.03	NA	0.04
Minimum	NA	1.12	NA	1.05
Maximum	NA	1.20	NA	1.18

NA=not available due to a small number of samples received.

Cover photo

yellow peas*

green peas*

maple peas*

red lentils*

green lentils*

pea beans**

chick peas*

* Images courtesy of Grain Biology, Grain Research Laboratory, Canadian Grain Commission

** Pea beans, Canada image courtesy of Industry Services, Canadian Grain Commission.