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Canada

Quality of western Canadian pulse crops 2003

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Table of contents

Tables

Figures

Introduction

This report presents the quality data of the 2003 harvest survey for western Canadian pulse crops (peas, lentils, chick peas and white pea beans). Pulse samples submitted by western Canadian producers to the Canadian Grain Commission's (CGC) Grain Research Laboratory (GRL) in this fall were collected for data analysis

Summary

Pulse crops (peas, lentils, chick peas and white pea beans) in 2003 harvest survey showed smaller seed sizes compared to last year due to hot weather and lack of moisture over much of the prairies. The average protein content for 2003 peas was similar to that for 2002 but lentils and white pea beans in 2003 had higher mean protein contents than in 2002 (Table 1). Yellow peas exhibited slightly higher water absorption but harder texture when cooked compared to last year. The mean cooking times for yellow and green peas were 19.9 and 18.4 min, respectively. Large green and red lentils showed similar water absorption values to 2002 survey. White pea beans in 2003 had higher water absorption than in 2002. The average cooking time and hardness value for cooked beans were about 24.0 min and 15.8 kg/g, respectively. The average water absorption value for 2003 Kabuli chick peas was higher than 3-year average. The wet harvest in many areas of the prairies in the fall of 2002 affected the quality of green peas, lentils, and chick peas. As a result, the CGC did not receive a sufficient number of No. 1 and 2 grade samples to include their results in the 2002 harvest survey.

Weather review

The weather review for the 2003 crop year was provided by the Weather and Crop Surveillance department of the Canadian Wheat Board (CWB).

Seeding

A combination of rains during the 2002 harvest and normal to above normal winter precipitation greatly improved the soil moisture situation in western Canada for the spring seeding season. The wetter than normal precipitation pattern continued through the month of April and into early May in Saskatchewan and Alberta. Amounts received during that period were 125 to 175 per cent of normal, which delayed seeding progress. The spring precipitation was accompanied by cooler than normal temperatures, which slowed planting progress as well. Temperatures recovered by May 15 and seeding advanced rapidly in the western prairies.

Manitoba and parts of eastern Saskatchewan did not experience planting delays, due to drier and warmer weather in the first half of May. This allowed farmers to plant most cereal, oilseed and pulse crops before May 15 in the eastern growing region. Overall

planting progress was 10 days to two weeks behind normal for the prairies. Planting of all grains and oilseeds in western Canada advanced rapidly during the second half of May and was complete by the first week in June. Germination and emergence of crops was very good, but some patches of severe frost in northern Saskatchewan and Alberta meant that some crops needed reseeding.

Growing conditions

Moisture conditions began to deteriorate in the second half of June in the northern and central areas of Saskatchewan. The dryness, combined with above normal temperatures, resulted in stress to crops. The rest of the region received timely rainfall throughout June, but total amounts for the month were below normal over most of the prairie region. Although the crop was rated in mostly good to excellent condition in mid-June, the lack of sub-soil moisture was a major concern. These concerns were well founded, as hot and dry conditions dominated the weather on the prairies from mid-June to late August. The southern prairies received less than 50 per cent of normal precipitation in July and August, while the northern areas received less than 75 per cent of normal precipitation.

The rains were very timely in northern Alberta and northwestern Saskatchewan over the summer months, which helped maintain crop potential. Temperatures were warmer than normal during the months of July and August, which increased stress to all crops. August temperatures were 2 to 5 degrees Celsius above normal across western Canada. The warmer than normal temperatures caused yield reductions in all crops, dropping above average production potential back to average to slightly-below-average in most regions. Due to timely rains, yield losses were limited to the northern growing areas of Alberta.

The warm, dry weather during the summer months was ideal for grasshoppers, which resulted in significant damage to crops throughout the prairie region. The environmental conditions did keep plant diseases in check, with leaf and head diseases reported at the lowest levels in a decade. Crop development was boosted by the warmer than normal temperatures, with cereal crops reaching maturity by the end of July in the eastern prairies. Grain crops in western areas were not mature until the middle of August, while northern Alberta and the Peace River region were delayed until the end of the month.

Harvest conditions

The harvest began the first week of August on the eastern Prairies and was underway in all areas except northern Alberta by the middle of the month. Rainfall during August and September was well below normal, which resulted in a rapid harvest pace. Over 80 per cent of the crop was harvested by the first week of September, with most of the unfinished harvest located in northern Alberta and Saskatchewan. Cool, rainy conditions in the northern areas slowed the harvest in the middle of September, but the return of warm, dry conditions by the end of the month allowed the harvest to proceed rapidly. The harvest was essentially complete by the first week of October, which is a dramatic improvement over the previous year, when only two-thirds of the crop had been harvested by that time.

Production review

Pea production for 2003 was estimated at 2.1 million tonnes, which was 50% higher than 2002 production of 1.4 million tonnes and 17% higher than the 10-year average of 1.8 million tonnes (Table 2). The increase in production is due to increases in both harvested area and yield. In 2003, Saskatchewan accounted for 69% of Canadian pea production, Alberta for 24%, and Manitoba for 7%.

Production of lentils in 2003 increased by 47% from 0.35 million tonnes in 2002 to 0.52 million tonnes. This was due to increases in both harvested area and yield (Table 2). The production was slightly higher than the 10-year average. Saskatchewan continues to dominate lentil production in western Canada, accounting for more than 98% of production.

In 2003, Manitoba accounted for 100% of western Canadian white pea bean production. Production of western Canadian white pea beans in 2003 (84 thousand tonnes) decreased 33% as compared to that in 2002 but was still double the 10-year average (Table 2). Harvested area decreased by 33% to 45 thousand hectares in 2003 from 67 thousand hectares in 2002. Yield increased by 5% from 1.8 tonnes per hectare in 2002 to 1.9 tonnes per hectare in 2003.

Production of chick peas for 2003 was estimated at 68 thousand tonnes. This was 73% lower than the 10-year average of 0.25 million tonnes and 57% below 2002 production of 0.16 million tonnes (Table 2). The decreased production was due to the reduction in harvested area. Yield for 2003 was 1.1 tonnes per hectare, which was comparable to that for 2002. Saskatchewan accounted for approximately 80% of western Canadian chick pea production in 2003 and Alberta for 20%.

Table 1a – Canada western pulse crops quality data for 2003 harvest survey

Quality parameter	Mean for No. 1 Canada 2003	2002	1998-2002
Peas			
Protein content, %	24.4	24.1	23.9
Yellow peas			
100-seed weight, g/100 seeds	21.0	23.3	23.5
Water absorption, g H_2O/g seeds	1.01	0.95	0.95
Cooking time, min	19.9	–	–
Hardness (cookability), kg/g cooked seeds	10.1	8.5	9.3
Green peas			
100-seed weight, g/100 seeds	19.7	–	21.6
Water absorption, g H_2O/g seeds	1.06	–	0.95
Cooking time, min	18.4	–	–
Hardness (cookability), kg/g cooked seeds	10.8	–	–
Lentils[1]			
Protein content, %	26.7	25.3	26.3
Small green lentils (SL)[3]			
100-seed weight, g/100 seeds	3.4	–	3.4
Water absorption, g H_2O/g seeds	0.88	–	0.81
Mean seed size[2], mm	4.5	–	–
Medium green lentils (ML)[4]			
100-seed weight, g/100 seeds	5.1	–	4.9
Water absorption, g H_2O/g seeds	0.98	–	0.92
Mean seed size[2], mm	5.7	–	–
Large green lentils (LL)[5]			
100-seed weight, g/100 seeds	6.4	7.3	6.9
Water absorption, g H_2O/g seeds	1.02	0.98	0.94
Mean seed size[2], mm	6.1	6.2	6.2
Red lentils			
100-seed weight, g/100 seeds	2.9	3.0	3.2
Water absorption, g H_2O/g seeds	0.95	0.95	0.93
Mean seed size[2], mm	4.5	5.3	5.4

[1] No. 1 and No. 2 Canada combined.
[2] Seed size determined by the Image Analysis technique.
[3] SL - small lentils including the varieties Eston and Milestone.
[4] ML - medium lentils including the varieties Richlea and Vantage.
[5] LL - large lentils including the varieties Laird, Glamis, Sovereign and Grandora.

Table 1b – Canada western pulse crops quality data for 2003 harvest survey

Quality parameter	Mean for No. 1 Canada		
	2003	2002	1998-2002
White pea beans			
Protein content, %	26.2	24.6	24.8
100-seed weight, g/100 seeds	16.6	21.0	19.9
Water absorption, g H_2O/g seeds	0.97	0.85	0.88
Cooking time, min	23.9	–	–
Hardness (cookability), kg/g cooked seeds	15.8	–	–
Kabuli chick peas			
Protein content, %	23.3	–	24.2
100-seed weight, g/100 seeds	30.6	–	43.2
Water absorption, g H_2O/g seeds	1.15	–	1.04

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

Province	Harvested area		Production		Yield		Mean production[2]
	2003	2002	2003	2002	2003	2002	1993-2002
	thousand hectares		thousand tonnes		kg/ha		thousand tonnes
Dry peas							
Manitoba	55	81	137	177	2520	2200	154
Saskatchewan	967	818	1470	964	1520	1400	1199
Alberta[3]	249	184	517	225	2076	1300	428
Western Canada	**1271**	**1082**	**2124**	**1366**	**1670**	**1300**	**1781**
Lentils							
Manitoba	1.6	–	2.7	–	1700	–	16
Saskatchewan	528	385	510	352	970	900	481
Alberta[3]	6.0	2.4	6.9	1.9	1150	800	10
Western Canada	**536**	**387**	**520**	**354**	**970**	**910**	**507**
White pea beans							
Manitoba	45	67	84	125	1890	1800	47
Saskatchewan	–	–	–	–	–	–	–
Alberta[3]	–	–	–	–	–	–	–
Western Canada	**45**	**67**	**84**	**125**	**1890**	**1800**	**47**
Chick peas							
Manitoba	–	–	–	–	–	–	–
Saskatchewan	53	142	54	141	1040	1000	239[4]
Alberta[3]	10	12	13	16	1310	1300	10[4]
Western Canada	**63**	**154**	**68**	**157**	**1080**	**1000**	**249[4]**

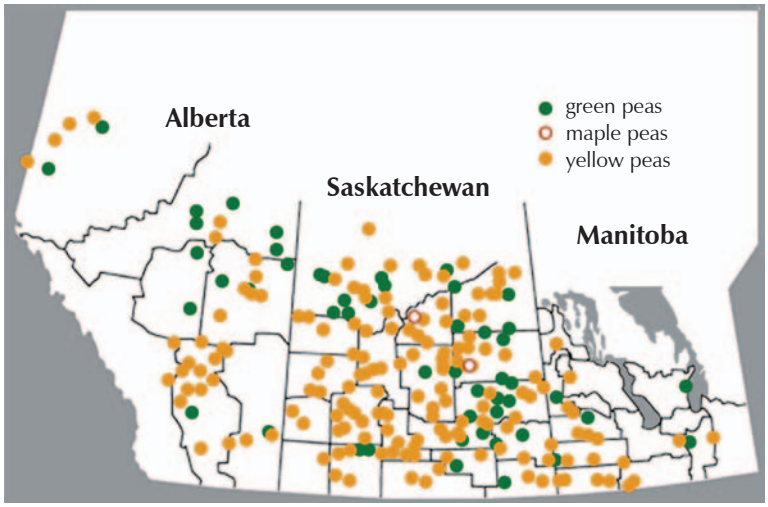
[1] Statistics Canada, *Field Crop Reporting Series*, Vol. 82, No. 8.
[2] Statistics Canada, *Field Crop Reporting Series*, 1993-2002.
[3] Includes the Peace River area of British Columbia.
[4] Statistics Canada, *Field Crop Reporting Series*, 1998-2002.

Quality of western Canadian peas 2003

Harvest survey samples

Samples for the CGC's 2003 harvest survey were collected from producers across western Canada (Fig. 1). A total of 563 samples consisting of 406 yellow pea samples, 155 green pea samples, and 2 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 No. 1 Canada or No. 2 Canada were tested for 100-seed weight, water absorption, cooking time and hardness 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 2003 harvest survey pea samples



Quality of 2003 western Canadian peas

The average protein content for 2003 western Canadian peas was 24.3% (Table 3). This was similar to that for 2002, but slightly higher than the five-year average of 23.8% (Fig. 2). The mean protein content did not change significantly between grades.

The No. 1 grade yellow peas had a mean 100-seed weight of 21.0 g, lower than that for the 2002 No. 1 grade (Table 4). The mean 100-seed weight for the 2003 No. 2 grade was 20.9 g. This was lower than that for the 2002 No. 2 grade. The smaller seed sizes may be due to the hot weather and lack of moisture when the pods were filing. The mean water absorption values for the 2002 No. 1 and No. 2 grade were 1.01 (g H_2O/g seeds), which was slightly higher than that for 2002. 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 No. 1 and No. 2 grade yellow peas were 19.9 and 22.8 min, respectively. There were no cooking time data available for 2002 peas since this is first time to include the cooking time test in the harvest survey.

The cookability is expressed as an index of hardness of cooked peas. At a fixed cooking time, the force required to compress a cooked pea sample is related to the softness of the cooked peas. The mean hardness values of cooked yellow peas for the 2003 No. 1 and No. 2 grade were 10.1 and 9.6 kg/g cooked seeds, respectively (Table 4). These were higher than the respective grades in 2002.

Samples of green peas graded No. 1 and No. 2 had similar mean 100-seed weight (Table 5). The mean water absorption values for No. 1 and No. 2 Canada were 1.06 and 1.05 (g H_2O/g), respectively. There were no differences in the mean cooking time and hardness values between samples graded No. 1 and No. 2. The wet harvest in many areas of the prairies in the fall of 2002 affected the quality of green peas. As a result, the CGC did not receive a sufficient number of No. 1 and 2 grade samples to include their results in the 2002 harvest survey.

Table 3 – Mean protein content for 2003 western Canadian peas by grade[1]

	Protein content		
Grade	2003	2002	1998-2002
	%	%	%
No. 1 Canada	24.4	24.1	23.9
No. 2 Canada	24.2	24.2	23.7
No. 3 Canada	24.0	24.7	23.9
All grades	24.3	24.3	23.8

[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

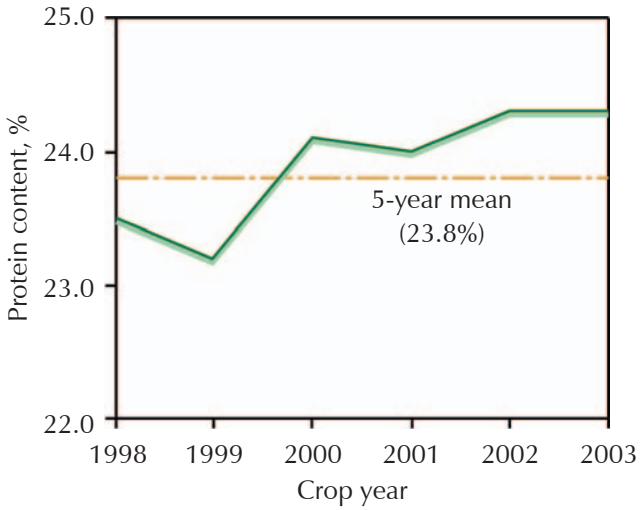


Table 4 – Quality data for 2003 western Canadian yellow peas

	No. 1 Canada		No. 2 Canada	
Quality parameter	2003	2002	2003	2002
100-seed weight, g/100 seeds				
Number of samples	172	33	174	83
Mean	21.0	23.3	20.9	23.5
Standard deviation	2.2	3.8	2.8	3.6
Minimum	14.7	16.4	12.3	13.6
Maximum	29.8	34.9	29.3	35.1
Water absorption, g H_2O/g seeds				
Number of samples	172	33	174	83
Mean	1.01	0.95	1.01	0.95
Standard deviation	0.10	0.05	0.09	0.05
Minimum	0.51	0.87	0.68	0.83
Maximum	1.16	1.09	1.17	1.05
Cooking time, min				
Number of samples	29	–	15	–
Mean	19.9	–	22.8	–
Standard deviation	9.0	–	5.2	–
Minimum	7.7	–	15.7	–
Maximum	41.4	–	30.8	–
Hardness (cookability), kg/g cooked seeds				
Number of samples	169	33	174	83
Mean	10.1	8.5	9.6	9.0
Standard deviation	2.9	2.5	2.7	2.7
Minimum	4.7	4.9	4.3	4.0
Maximum	18.1	14.3	18.9	14.5

Table 5 – Quality data for 2003 western Canadian green peas

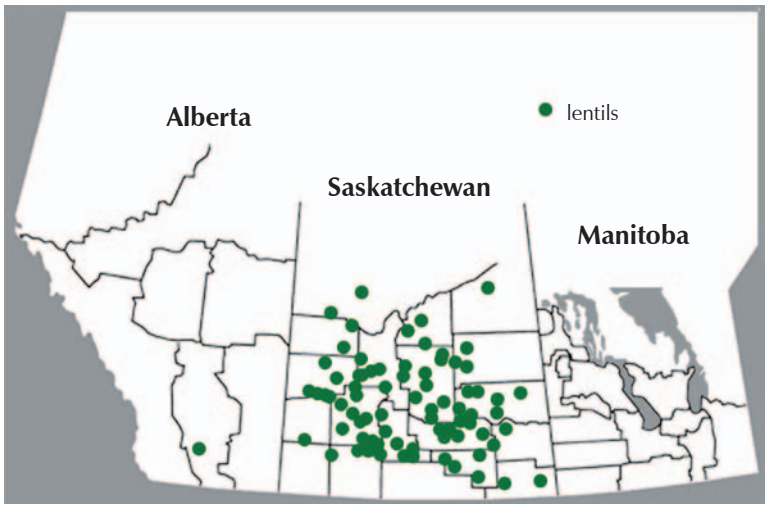
	No. 1 Canada		No. 2 Canada	
Quality parameter	2003	2002	2003	2002
100-seed weight, g/100 seeds				
Number of samples	39	–	46	–
Mean	19.7	–	19.6	–
Standard deviation	3.1	–	2.6	–
Minimum	14.5	–	15.9	–
Maximum	25.3	–	26.6	–
Water absorption, g H_2O/g seeds				
Number of samples	39	–	46	–
Mean	1.06	–	1.05	–
Standard deviation	0.09	–	0.13	–
Minimum	0.85	–	0.45	–
Maximum	1.27	–	1.23	–
Cooking time, min				
Number of samples	11	–	16	–
Mean	18.4	–	19.3	–
Standard deviation	5.9	–	7.2	–
Minimum	9.9	–	9.1	–
Maximum	27.0	–	32.8	–
Hardness (cookability), kg/g cooked seeds				
Number of samples	39	–	46	–
Mean	10.8	–	10.4	–
Standard deviation	2.6	–	2.6	–
Minimum	5.7	–	6.1	–
Maximum	16.9	–	17.8	–

Quality of western Canadian lentils 2003

Harvest survey samples

Samples for the CGC's 2003 harvest survey were collected from producers across western Canada (Fig. 3). A total of 232 lentil samples were received at the CGC for analysis. All samples were graded and tested for protein content. Only those samples receiving a grade of No. 1 Canada or No. 2 Canada were tested for 100-seed weight and water absorption. In addition, seed size distribution was measured by the Image Analysis technique. 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 2003 harvest survey lentil samples



Quality of 2003 western Canadian lentils

The average protein content for 2003 western Canadian lentils was 26.7% (Table 6). This was higher than that for 2002 but was similar to the five-year average of 26.6% (Fig. 4). Grade had a little effect on the crude protein content.

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 3.4 g (Table 7). Medium size green lentils (Richlea and Vantage) had an average 100-seed weight of 5.1 g. Large size green lentils including the varieties Laird, Glamis, Sovereign and Grandora had a mean 100-seed weight of 6.4 g. Large

green lentils in the 2003 survey were smaller than large lentils in the 2002 survey (Table 7). This may be due to the hot weather and lack of moisture. The mean water absorption values were in the range of 0.88 to 1.02 g H_2O/g seeds.

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 2003, 82% fell within 4.5 to 6.0 mm; 88% of medium size lentils fell in the range of 5.5-7.0 mm. In 2003 survey 66% of large lentils were within the range of 5.5 to 7.0 mm as compared to 76% in the 2002 survey. Due to the drought conditions experienced in western Canada in 2002, the CGC did not receive a sufficient number of samples to include results of small and medium size green lentils in the 2002 harvest survey.

Red lentils including the varieties Crimson, Redwing, Redcap and Robin had a mean 100-seed weight of 2.9 g (Table 9), which was similar to that in 2002. The mean water absorption value was 0.95 g H_2O/g seeds, which was close to that in 2002.

In 2003, 72% red lentils fell within 4.5 to 5.5 mm compared to 91% in the range of 5.0 to 6.0 mm in 2002 (Table 10). This indicated that red lentils in 2003 had smaller seed sizes than in 2002 due to the hot weather and lack of moisture.

Table 6 – Protein content for 2003 western Canadian lentils by grade[1]

	Protein content		
Grade	2003	2002	1998-2002
	%	%	%
No. 1 Canada	26.7	25.3	26.3
No. 2 Canada	26.7	26.1	26.5
No. 3 Canada	26.6	26.4	27.0
All grades	26.7	25.9	26.6

[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

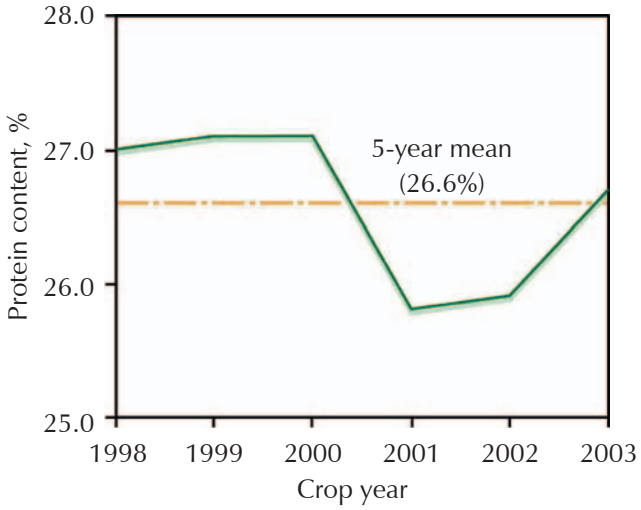


Table 7 – Quality data for 2003 western Canadian green lentils by size

	2003			2002		
	SL[1]	ML[2]	LL[3]	SL[1]	ML[2]	LL[3]
	Number of samples			Number of samples		
Quality parameter	22	17	151	–	–	11
100-seed weight, g/100 seeds						
Mean	3.4	5.1	6.4	–	–	7.3
Standard deviation	0.2	0.3	0.6	–	–	0.9
Minimum	2.9	4.6	4.6	–	–	6.3
Maximum	3.7	5.9	7.8	–	–	8.5
Water absorption, g H_2O/g seeds						
Mean	0.88	0.98	1.02	–	–	0.98
Standard deviation	0.09	0.04	0.09	–	–	0.05
Minimum	0.71	0.90	0.37	–	–	0.86
Maximum	1.05	1.05	1.20	–	–	1.04

[1] SL – small lentils including the varieties Eston and Milestone.
[2] ML – medium lentils including the varieties Richlea and Vantage.
[3] LL – large lentils including the varieties Laird, Glamis, Sovereign and Grandora.

Table 8 – Seed size distribution for 2003 western Canadian green lentils[1]

	2003			2002		
	SL[2]	ML[3]	LL[4]	SL[2]	ML[3]	LL[4]
	Number of samples			Number of samples		
Seed size distribution	23	14	132	–	–	11
3.5-4.0 mm, %	0.9	0	0	–	–	0
4.0-4.5 mm, %	15.0	0	0	–	–	0.1
4.5-5.0 mm, %	36.2	0.1	0.1	–	–	1.3
5.0-5.5 mm, %	32.7	6.6	3.0	–	–	12.7
5.5-6.0 mm, %	13.4	31.3	14.5	–	–	22.9
6.0-7.0 mm, %	1.8	56.8	51.8	–	–	53.3
7.0-7.5 mm, %	0	4.7	21.9	–	–	8.8
>7.5 mm, %	0	0.4	8.7	–	–	1.1

[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 2003 western Canadian red lentils[1]

	2003	2002
	Number of samples	
Quality parameter	25	6
100-seed weight, g/100 seeds		
Mean	2.9	3.0
Standard deviation	0.4	0.3
Minimum	2.1	2.5
Maximum	3.5	3.3
Water absorption, g H_2O/g seeds		
Mean	0.95	0.95
Standard deviation	0.11	0.03
Minimum	0.72	0.91
Maximum	1.25	0.98

[1] Red lentils (Crimson, Robin, Redcap and Redwing).

Table 10 – Seed size distribution for 2003 western Canadian red lentils[1]

	2003	2002
	Number of samples	
Seed size distribution[2]	25	6
3.5-4.0 mm, %	0.7	0
4.0-4.5 mm, %	13.3	3.1
4.5-5.0 mm, %	38.3	5.6
5.0-5.5 mm, %	33.8	75.7
5.5-6.0 mm, %	12.6	14.8
6.0-7.0 mm, %	1.3	0.8
>7.0 mm, %	0	0

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

Quality of western Canadian white pea beans 2003

Harvest survey samples

Samples for the Canadian Grain Commission harvest survey were collected from producers across Manitoba, Canada (Fig. 5). For the 2003 harvest survey, 63 white pea bean samples were received at the Canadian Grain Commission for analysis. All samples were graded and analyzed for protein content. Only those samples receiving a grade of Extra No. 1 Canada, Canada No. 1 Select, No. 1 Canada or No. 2 Canada were tested for 100-seed weight, water absorption, cooking time and hardness of cooked beans (cookability). 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 2003 harvest survey white pea bean samples

Quality of 2003 western Canadian white pea beans

The average protein content for 2003 was 26.5%, which was higher than that for 2002 (Table 11). This was higher than the three-year average (Table 11). It seemed that grade had a little effect on the mean protein content.

The average seed weights for No. 1 grade (16.6 g) and No. 2 grade (17.6 g) were lower than the respective grades in 2002. This may be due to the hot weather and lack of moisture in 2003 as compared to in 2002. Grade appeared to have a little effect on seed weight.

The average water absorption value for 2003 No. 1 grade was higher than that for No. 2 grade (Table 12). The average water absorption values for 2003 No. 1 and No. 2 grades were similar to the respective grades in 2002.

Cooking time was determined using an automated Mattson cooker device developed at the CGC. The mean cooking times for No. 1 and No. 2 grade white pea beans were 23.9 and 24.3 min, respectively. There were no cooking time data available for 2002 survey since this is first time to include the cooking time test in the harvest survey. There were no differences in the mean hardness values between samples graded No. 1 and No. 2.

Table 11 – Mean protein content for 2003 western Canadian white pea beans[1]

	Protein content		
Grade	2003	2002	2000-2002
	%	%	%
Extra No. 1 Canada	26.1	23.8	24.7
Canada No. 1 Select	25.9	24.5	24.9
No. 1 Canada	26.2	24.6	24.8
No. 2 Canada	26.3	25.1	25.3
No. 3 Canada	27.0	25.3	25.6
No. 4 Canada	27.8	24.9	25.3
All grades	26.5	24.9	25.1

[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 white pea beans

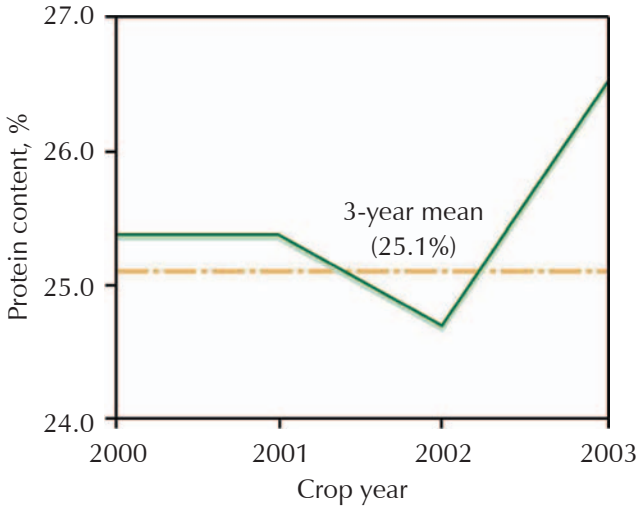


Table 12 – Quality data for 2003 western Canadian white pea beans

	No. 1 Canada[1]		No. 2 Canada	
Quality parameter	2003	2002	2003	2002
100-seed weight, g/100 seeds				
Number of samples	45	47	5	25
Mean	16.6	21.0	17.6	21.5
Standard deviation	1.3	1.1	2.9	1.0
Minimum	14.0	18.6	15.0	19.5
Maximum	20.8	22.6	21.1	23.6
Water absorption, g H_2O/g seeds				
Number of samples	45	47	5	25
Mean	0.97	0.85	0.95	0.89
Standard deviation	0.06	0.05	0.09	0.06
Minimum	0.82	0.74	0.82	0.80
Maximum	1.12	0.96	1.07	1.01
Cooking time, min				
Number of samples	45	–	5	–
Mean	23.9	–	24.3	–
Standard deviation	3.6	–	2.7	–
Minimum	16.5	–	20.8	–
Maximum	32.1	–	27.4	–
Hardness (cookability), kg/g cooked seeds				
Number of samples	45	–	5	–
Mean	15.8	–	15.6	–
Standard deviation	3.1	–	2.0	–
Minimum	8.0	–	13.8	–
Maximum	22.8	–	19.0	–

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

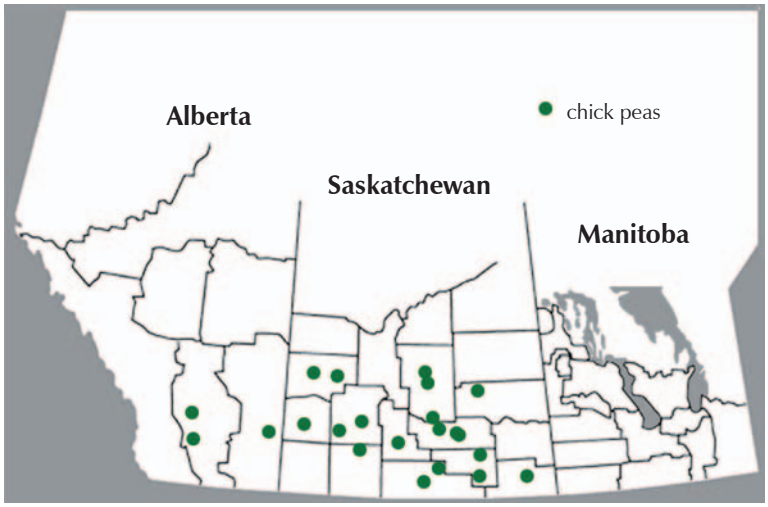
Quality of western Canadian chick peas 2003

Harvest survey samples

Samples for the CGC harvest survey were collected from producers across western Canada (Fig. 7). For the 2003 harvest survey, 18 Kabuli chick pea samples were received at the CGC for analysis. All samples were graded and analyzed for protein content. Only those samples receiving a grade of No. 1 CW or No. 2 CW 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.

Due to the small number of Desi chick pea samples received at the CGC, results for Desi chick peas were not included in the 2003 quality report.

Figure 7 – Map of western Canada showing origin of 2003 harvest survey chick pea samples



Quality of 2003 western Canadian chick peas

The average protein content for 2003 western Canadian chick peas was 23.6% (Table 13). This was 1.4% higher than that for 2002 and slightly higher than the three-year average of 22.9% (Fig. 8). The mean protein content did not change significantly between grades.

Samples receiving a No. 1 CW grade in 2003 had an average 100-seed weight of 30.6 g. The mean seed weight for 2003 No. 2 CW grade was 35.9 g, which was lower than that for 2002 No. 2 CW grade (Table 14).

The average water absorption value for 2003 No. 1 CW grade was similar to that for No. 2 CW grade, but slightly higher than that for 2002 No. 2 CW grade (Table 14).

Table 13 – Mean protein content for 2003 western Canadian Kabuli chick peas by grade[1]

	Protein content		
Grade	2003	2002	2000-2002
	%	%	%
No. 1 CW	23.3	–	24.2
No. 2 CW	23.9	22.7	22.7
No. 3 CW	23.4	21.6	21.9
All grades	23.6	22.2	22.9

[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

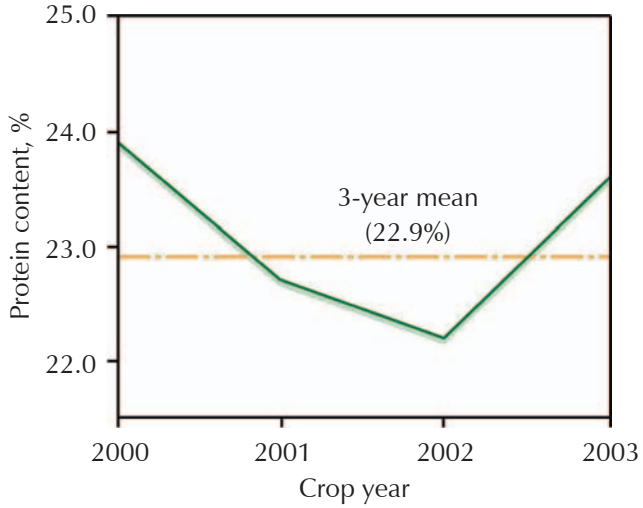


Table 14 – Quality data for 2003 western Canadian Kabuli chick peas

	No. 1 CW		No. 2 CW	
Quality parameter	2003	2002	2003	2002
100-seed weight, g/100 seeds				
Number of samples	10	–	7	6
Mean	30.6	–	35.9	41.8
Standard deviation	10.3	–	10.2	10.4
Minimum	21.9	–	23.6	30.1
Maximum	49.2	–	46.4	59.3
Water absorption, g H_2O/g seeds				
Number of samples	10	–	7	6
Mean	1.15	–	1.14	1.09
Standard deviation	0.03	–	0.04	0.19
Minimum	1.12	–	1.05	0.81
Maximum	1.20	–	1.18	1.33

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 bean image courtesy of Industry Services, Canadian Grain Commission.