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Canada

Quality of western Canadian canola 2003

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Table of contents

Tables

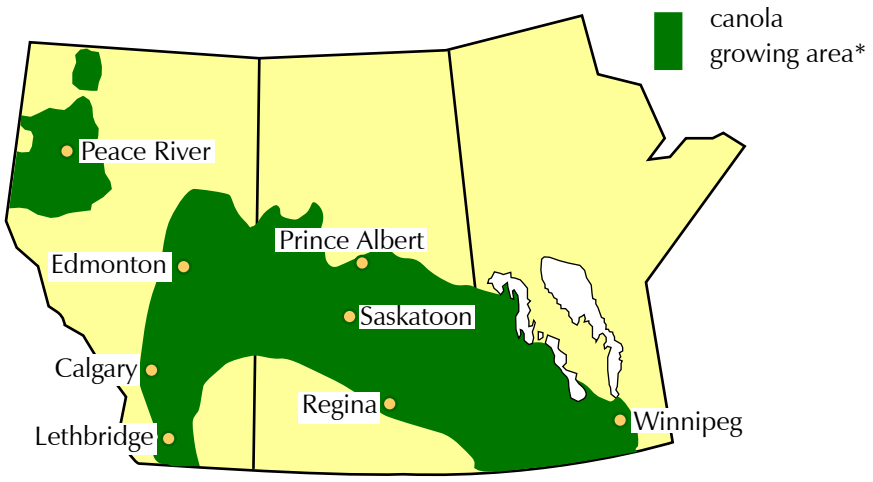
Figures

Figures (continued)

Introduction

This report presents quality data and information based on the Canadian Grain Commission (CGC) 2003 harvest survey of western Canadian canola. Quality parameters included are the contents of oil, protein, chlorophyll, glucosinolates and free fatty acids, and the fatty acid composition of harvest samples. Quality data are from analyses of canola samples submitted to the CGC throughout the harvest period by producers, grain companies and oilseed crushing companies. The map shows the traditional growing areas for canola in western Canada.

Figure 1– Map of western Canada showing traditional growing area for canola



* Source: Canola Council of Canada

Summary

The 2003 western Canadian canola crop is significantly below average in oil content and well above average in protein content. Compared to 2002, the mean oil content, 41.8%, is 0.7% lower while the mean protein content, 23.3%, is 0.1% higher. Compared to the 10-year means, oil content is 1.1% lower while the protein content is 2.4% higher.

The mean chlorophyll content for No. 1 Canada canola is 15 mg/kg, similar to the 13 mg/kg in 2002. The 2003 canola crop is higher in oleic acid content, 63.2%, and lower in linolenic acid content, 8.4%. For No. 1 Canada seed, the total saturated fatty acid content increased by 0.3% to 7.3%. This results in an oil with a lower mean iodine value, 110 units. The erucic acid, 0.1%, and the total seed glucosinolates, 11 μmol/g are similar to those in 2002. The free fatty acid (FFA) levels are lower in the 2003 canola seed.

Table 1– No. 1 Canada canola
Quality data for 2003 harvest survey

Quality parameter	2003	2002	1993-2002 Mean
Oil content[1], %	41.8	42.5	42.9
Protein content[2], %	23.3	23.2	20.9
Oil-free protein[2] content, %	42.9	43.3	39.4
Chlorophyll content, mg/kg in seed	15	13	14
Total glucosinolates[1], μmol/g	11	12	12
Free fatty acids, %	0.23	0.35	0.27
Erucic acid, % in oil	0.13	0.11	0.28
Linolenic acid, % in oil	8.4	10.6	10.2
Oleic acid, % in oil	63.2	60.6	60.5
Total saturated fatty acids[3], % in oil,	7.3	7.0	6.9
Iodine value	110	115	115

[1] 8.5% moisture basis

[2] N x 6.25, 8.5% moisture basis

[3] Total saturated fatty acids are the sum of palmitic (C16:0), stearic (C18:0), arachidic (C20:0), behenic (C22:0), and lignoceric (C24:0)

Weather and production review

Weather review

Temperature and precipitation patterns for the 2003 western Canadian growingseason can be found on the PFRA web site (http://www.agr.gc.ca/pfra/drought/maps/td03_08e.pdf). Of particular note this growing season was that both day and night temperatures were extremely high for long periods of time. The Weather and Crop Surveillance department of the Canadian Wheat Board provided the detailed weather review for the 2003 crop year (http://www.cwb.ca/en/growing/weather/crop_issues.jsp).

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 oilseed 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 were very good, but some patches of severe frost in northern Saskatchewan and Alberta meant that some crops needed reseeding.

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. Timely rains limited yield losses in 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 most crops reaching maturity by the end of July in the eastern Prairies. 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. The majority 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 Manitoba and Saskatchewan canola harvest was essentially completed by October 5th while the Alberta crop was estimated to be 90% harvested at that time.

Production and grade information

Western Canadian farmers planted 4.71 million hectares of canola in 2003, which is a 22% increase from last year's area (Table 2). Average to above average yields in 2003 for Manitoba and Alberta resulted in a western Canada yield of 1400 kg/ha which is higher than the 1300 kg/ha reported for 2002 and about three percent above the 10-year mean of 1364 kg/ha.

With the increased harvested area, total canola production in western Canada is up 60 percent to 6.60 million tonnes according to estimates by Statistics Canada reported in *Field Crop Reporting Series No. 8,* December 5, 2003. The largest proportion of 2003 production, 41 percent, was grown in Saskatchewan. Manitoba accounted for 26 percent while Alberta and British Columbia accounted for 33 percent.

Initially, there was concern for canola that was shriveled and under-sized due to the extreme drought. Those regions affected by the drought were generally harvested first. Overall, the green seed count was considered lower than the previous two crop years. In addition, there were relatively lower amounts of sprouted seed found in survey samples this year. While the proportion of canola seed in the top grades was high, the seed contained lower than average amounts of oil due to the extreme heat.

Table 2 – Seeded area and production for western Canadian canola

	Seeded area[1] thousand hectares		Production[1] thousand tonnes		Average production[2] thousand tonnes
	2003	2002	2003	2002	1993-2002
Manitoba	1012	890	1735	1429	1363
Saskatchewan	2307	1760	2676	1656	2739
Alberta[3]	1386	1210	2193	1037	2143
Western Canada	**4705**	**3861**	**6604**	**4121**	**6245**

[1] Source: *Field Crop Reporting Series, No. 8*, December 5, 2003; Statistics Canada
[2] Source: *Field Crop Reporting Series*, revised final estimates for 1993–2002
[3] Includes the part of the Peace River area that is in British Columbia

Harvest survey samples

Samples for the Canadian Grain Commission canola harvest survey are collected from producers, crushing plants and grain handling offices across western Canada. The samples are cleaned to remove dockage prior to testing. Harvest survey samples are analyzed for oil, protein, chlorophyll and total glucosinolates using a NIRS 6500 scanning near-infrared spectrometer. Grain Research Laboratory staff assign grade level based on chlorophyll content. Industry Services grain inspectors grade samples if they show significant levels of visible damage.

Grades and chlorophyll content relationships are based on long-term data.

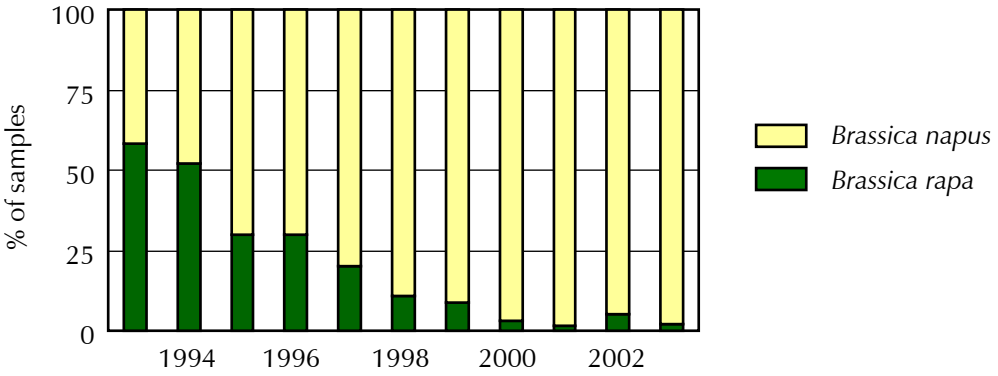
No. 1 Canada 25 mg/kg or less
No. 2 Canada 26 to 45 mg/kg
No. 3 Canada 46 to 100 mg/kg

Composite samples are used for free fatty acids and fatty acid composition analyses. Composites are prepared by combining No. 1 Canada samples by provincial crop district and No. 2, No. 3, and Sample grade samples by province.

This year's harvest survey report included 2,156 canola samples compared to 1,371 in 2002. Specialty oil samples such as high oleic acid, low linolenic acid, and high erucic acid, were excluded from this report. Saskatchewan contributed 950 samples, Manitoba 660 samples, and Alberta and British Columbia 546 samples during the survey period, August 15 to December 15, 2003. The proportion of *Brassica rapa* and *Brassica rapus* samples in the GRL surveys is shown in Figure 2.

Weighting factors used to calculate provincial and western Canadian means were derived from the previous five years average production for each crop district and the 2003 provincial production estimates in Statistics Canada's *Field Crop Reporting Series No. 8,* December 5, 2003. Factors used to calculate grade distributions are taken from crop reports published by the line elevator companies.

Figure 2 – 2003 harvest survey
Proportion of samples identified as *Brassica rapa* and *Brassica napus*



Acknowledgments

Seed images on cover courtesy of Grain Biology, Grain Research Laboratory, Canadian Grain Commission, Winnipeg MB.

Quality of western Canadian canola 2003

Tables 3, 4 and 5 show detailed information on the quality of western Canadian canola harvested in 2003. Table 6 compares the quality of recent canola exports. The numbers of samples in each grade or province may not be representative of the total production or grade distribution. However, there were sufficient samples to provide good quality information for each province. Provincial means were calculated from results for each crop district, weighted by a combination of five-year average production by crop district, and an estimate of grade distribution from line elevator companies. To calculate western Canadian averages for each grade, provincial averages are weighted by the Statistics Canada production estimate and the estimate of grade distribution.

Table 3 – 2003 harvest survey
Canola quality data by grade and province

	Number of samples	Oil content[1]			Protein content[2]			Chlorophyll content		
		Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.
		%			%			mg/kg		
No. 1 Canada										
Manitoba	636	41.8	34.6	49.7	23.1	15.4	29.8	14	2	25
Saskatchewan	812	41.1	35.4	48.5	23.7	17.1	29.3	15	0	25
Alberta[3]	473	42.7	35.3	50.6	22.9	17.0	29.1	16	0	25
Western Canada[4]	**1921**	**41.8**	**34.6**	**50.6**	**23.3**	**15.4**	**29.8**	**15**	**0**	**25**
No. 2 Canada										
Manitoba	21	40.3	38.0	43.2	24.7	21.1	28.6	33	16	45
Saskatchewan	122	40.1	34.7	46.1	24.8	20.0	28.3	34	0	45
Alberta[3]	67	41.2	35.0	49.7	24.7	17.3	28.9	33	2	45
Western Canada[4]	**210**	**40.5**	**34.7**	**49.7**	**24.8**	**17.3**	**28.9**	**33**	**0**	**45**
No. 3 Canada										
Manitoba	2	39.8	38.6	41.0	24.3	23.9	24.8	57	50	65
Saskatchewan	12	38.7	35.9	41.4	25.7	24.7	27.4	64	53	85
Alberta[3]	4	41.1	38.9	43.9	24.5	22.1	25.8	64	47	86
Western Canada[4]	**18**	**40.0**	**35.9**	**43.9**	**25.0**	**22.1**	**27.4**	**63**	**47**	**86**
Sample Canada										
Manitoba	1	41.8	41.8	41.8	21.5	21.5	21.5	17	17	17
Saskatchewan	4	38.4	36.9	40.6	25.1	23.9	26.6	28	0	76
Alberta[3]	2	42.0	40.3	43.7	20.5	19.8	22.3	11	4	21
Western Canada[4]	**7**	**40.9**	**36.9**	**43.7**	**22.1**	**19.8**	**26.6**	**18**	**0**	**76**

[1] 8.5% moisture basis
[2] N x 6.25; 8.5% moisture basis
[3] Includes part of the Peace River area that is in British Columbia
[4] Values are weighted averages based on production by province as estimated by (Statistics Canada).

Table 4 – 2003 harvest survey
Canola quality data by grade and province

	Number of samples	Glucosinolates[1]			Free fatty acids
		Mean	Min.	Max.	
		μmol/g			%
No. 1 Canada					
Manitoba	636	10	5	18	0.18
Saskatchewan	812	11	7	29	0.29
Alberta[2]	473	11	6	18	0.21
Western Canada[3]	**1921**	**11**	**5**	**29**	**0.23**
No. 2 Canada					
Manitoba	21	14	11	21	0.19
Saskatchewan	122	15	9	25	0.39
Alberta[2]	67	14	9	23	0.50
Western Canada[3]	**210**	**14**	**9**	**25**	**0.42**
No. 3 Canada					
Manitoba	2	13	11	16	n/a[4]
Saskatchewan	12	17	13	21	n/a[4]
Alberta[2]	4	15	11	19	n/a[4]
Western Canada[3]	**18**	**16**	**11**	**21**	**0.39**
Sample Canada					
Manitoba	1	10	10	10	n/a[4]
Saskatchewan	4	16	11	23	n/a[4]
Alberta[2]	2	21	10	25	n/a[4]
Western Canada[3]	**7**	**17**	**10**	**25**	**0.28**

[1] 8.5% moisture basis; total glucosinolates
[2] Includes part of the Peace River area that is in British Columbia
[3] Values are weighted averages based on production by province as estimated by (Statistics Canada).
[4] n/a (not applicable); composites were prepared for western Canada for No. 3 and Sample Canada grades

Table 5 – 2003 harvest survey
Fatty acid composition by grade and province

	Fatty acid composition[1], %								
	C16:0	C16:1	C18:0	C18:1	C18:2	C18:3	C20:0	C20:1	C20:2
No. 1 Canada									
Manitoba	4.1	0.3	2.0	63.8	18.5	7.9	0.7	1.3	0.1
Saskatchewan	4.1	0.3	2.1	63.4	18.8	7.7	0.7	1.2	0.1
Alberta[4]	3.9	0.3	1.9	62.3	18.2	9.7	0.6	1.4	0.1
Western Canada[5]	**4.0**	**0.3**	**2.0**	**63.2**	**18.5**	**8.4**	**0.7**	**1.3**	**0.1**
No. 2 Canada									
Manitoba	4.1	0.3	2.0	63.7	18.9	7.5	0.7	1.2	0.1
Saskatchewan	4.2	0.3	2.1	62.7	19.3	7.8	0.7	1.3	0.1
Alberta[4]	3.9	0.3	2.0	61.8	18.0	9.1	0.7	1.9	0.1
Western Canada[5]	**4.1**	**0.3**	**2.1**	**62.4**	**18.7**	**8.3**	**0.7**	**1.5**	**0.1**
No. 3 Canada									
Western Canada[5]	**4.2**	**0.3**	**2.2**	**62.6**	**19.0**	**7.7**	**0.7**	**1.5**	**0.1**
Sample Canada									
Western Canada[5]	**3.9**	**0.3**	**2.0**	**60.5**	**19.7**	**8.8**	**0.6**	**1.7**	**0.1**

	Fatty acid composition[1], %					
	C22:0	C22:1	C24:0	C24:1	Total saturates[2]	Iodine value[3]
No. 1 Canada						
Manitoba	0.3	0.1	0.2	0.1	7.4	109
Saskatchewan	0.3	0.1	0.2	0.1	7.4	109
Alberta[4]	0.3	0.2	0.2	0.2	6.9	112
Western Canada[5]	**0.3**	**0.1**	**0.2**	**0.2**	**7.3**	**110**
No. 2 Canada						
Manitoba	0.4	0.0	0.2	0.2	7.5	109
Saskatchewan	0.4	0.1	0.2	0.1	7.6	109
Alberta[4]	0.3	0.7	0.2	0.2	7.2	111
Western Canada[5]	**0.4**	**0.3**	**0.2**	**0.2**	**7.4**	**110**
No. 3 Canada						
Western Canada[5]	**0.4**	**0.3**	**0.2**	**0.2**	**7.7**	**109**
Sample Canada						
Western Canada[5]	**0.3**	**1.0**	**0.2**	**0.2**	**7.0**	**112**

[1] Percentage of total fatty acids including: palmitic (C16:0), palmitoleic (C16:1), stearic (C18:0), oleic (C18:1), linoleic (C18:2), linolenic (C18:3), arachidic (C20:0), gadoleic (C20:1), eicosadienoic (C20:2), behenic (C22:0), erucic (C22:1), lignoceric (C24:0), nervonic (C24:1)

[2] Total saturated fatty acids are the sum of palmitic (C16:0), stearic (C18:0), arachidic (C20:0), behenic (C22:0), and lignoceric (C24:0)

[3] Calculated from fatty acid composition

[4] Includes part of the Peace River area that is in British Columbia

[5] Values are weighted averages based on production by province as estimated by (Statistics Canada).

Table 6 – No. 1 Canada canola
Comparisons of quality data for 2003 harvest survey with data for recent export shipments

		November 2003 exports		2002–03 exports	
Quality parameter	2003 survey	Thunder Bay	Vancouver	Thunder Bay	Vancouver
Oil content[1], %	41.8	41.2	41.2	41.0	41.9
Protein content[2], %	23.3	22.4	23.5	23.0	22.5
Oil-free protein content[2], %	42.9	40.7	42.8	41.7	41.6
Chlorophyll, mg/kg in seed	15	13	20	20	23
Total glucosinolates, μmol/g	11	12	14	13	14
Free fatty acids, %	0.23	0.55	0.68	0.86	0.67
Erucic acid, % in oil	0.13	0.04	0.30	0.08	0.15
Linolenic acid, % in oil	8.4	8.4	9.4	9.9	10.4
Oleic acid, % in oil	63.2	63.3	61.8	61.2	60.7
Total saturated fatty acids[3],% in oil	7.3	7.2	7.1	7.3	7.2
Iodine value	110	110	111	113	114

[1] 8.5% moisture basis

[2] N x 6.25; 8.5% moisture basis

[3] Total saturated fatty acids are the sum of palmitic (C16:0), stearic (C18:0), arachidic (C20:0), behenic (C22:0), and lignoceric (C24:0).

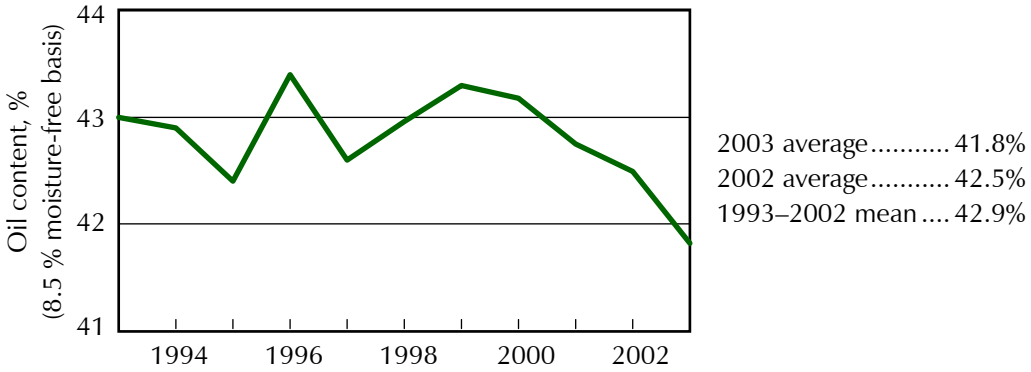
Oil content

The average oil content of 41.8% for No. 1 Canada canola from the 2003 harvest survey is lower than both the 42.5% in 2002 and the 10-year mean of 42.9% (Table 1). The Alberta oil content of 42.7% is significantly higher than the 41.1% and 41.8% for Saskatchewan and Manitoba. Compared to 2002, mean oil contents have increased by 0.6 percentage units in Alberta, but decreased by 1.7 and 0.7 percentage units for Saskatchewan and Manitoba respectively. The oil content of No. 1 Canada canola from producers in western Canada varied from 34.6% to 50.6%. The average oil contents decreased significantly in the lower grades of canola.

The decreased oil contents seen in the 2003 survey are a result of the extreme heat and drought that affected large parts of the canola growing area. Temperature and precipitation details of the 2003 growing season can be found at: http://www.agr.gc.ca/pfra/drought/maps/td03_08e.pdf. Of particular note this growing season was that both day and night temperatures were extremely high for a long period of time. Hot, dry growing conditions tend to produce canola seed with lower oil contents but higher protein content.

The mean oil content of canola exports from Vancouver in November 2003 was 41.2% on an 8.5% moisture basis, 0.7% lower than the 2002-03 mean of 41.9% (Table 6). The mean oil content of Thunder Bay exports in November 2003 was also 41.2% on an 8.5% moisture basis. The oil content of Canadian exports in the 2003-04 shipping season will likely remain near 41% on an 8.5% moisture basis.

Figure 3 – No. 1 Canada canola
Oil content of harvest survey samples, 1993–2003

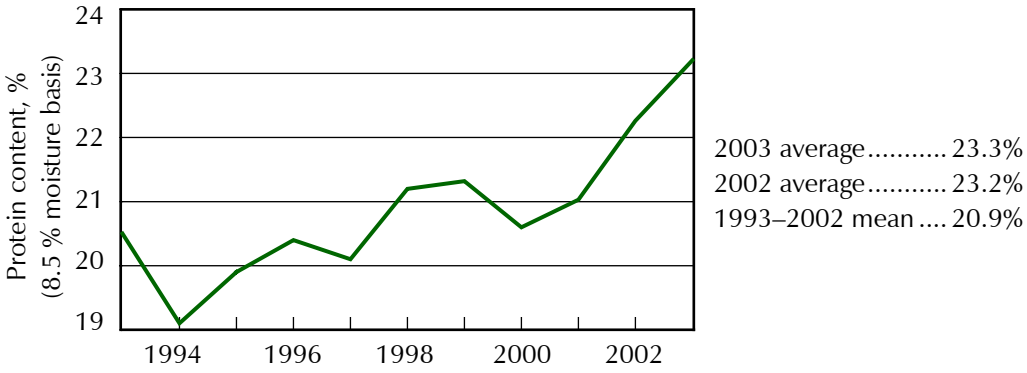


Protein content

The average seed protein content of 23.3% for No. 1 Canada canola from the 2003 harvest survey is similar to the 23.2% in 2002 and well above the 10-year mean of 20.9% (Table 1). The 2003 protein content calculated on an oil-free, 8.5% moisture basis is 42.9% compared to 43.3 % in 2002. The Saskatchewan protein content of 23.7% is higher than the 23.1% in Manitoba and the 22.9% in Alberta. Compared to 2002, mean protein contents increased by 0.7 and 0.1 percentage units respectively in Saskatchewan and Manitoba, but decreased by 1.1 percentage unit in Alberta. The protein content of No. 1 Canada canola from producers in western Canada varied from 15.4% to 29.8%. The average protein contents increased in the lower grades of canola.

The protein content of No. 1 Canada canola exports from Vancouver averaged 23.5% in November 2003 compared to 22.5% during the 2002-03 shipping season. The protein content in Vancouver exports should remain above 23.0% for the remainder of the 2003-04 shipping season. Protein content of November 2003 Thunder Bay canola shipments averaged 22.4%, a 0.6% decrease from the 2002-03 mean of 23.0%.

Figure 4 – No. 1 Canada canola
Protein content of harvest survey samples, 1993–2003



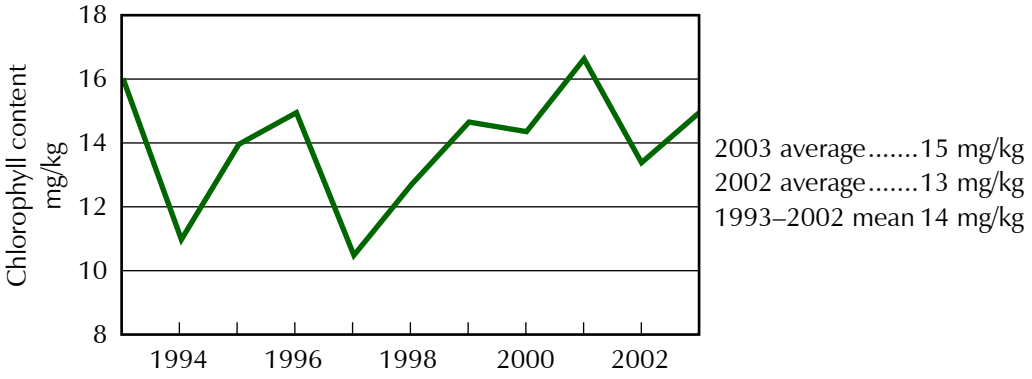
Chlorophyll content

Harvest survey samples of No. 1 Canada canola averaged 15 mg/kg chlorophyll in the 2003 survey, higher than the 13 mg/kg in the 2002 harvest (Table 2). The chlorophyll level of 14 mg/kg for Manitoba seed was slightly lower than the 16 mg/kg for Alberta and the 15 mg/kg for Saskatchewan. Chlorophyll levels for No. 2 Canada canola averaged 33 mg/kg, slightly higher than the 29 mg/kg for No. 2 Canada canola seed in 2002. Some of the lower grade samples were assigned those grades due to grading factors other than just immaturity (distinctly green seed).

Based on discussions with producers and processors, high distinctly green seed (DGR) levels were a degrading factor in some canola-growing areas. Where canola was swathed under hot, dry conditions there was insufficient opportunity for chlorophyll to degrade naturally. In other areas, delays in spring planting and uneven germination resulted in a late-harvested crop with higher levels of green seed. Overall, the green seed count is considered lower than in 2002 and 2001.

The November 2003 shipments of canola leaving Vancouver and Thunder Bay had average chlorophyll levels of 20 and 13 mg/kg respectively. Both of these November values were lower than the average chlorophyll levels in the 2002-03 exports. The levels of chlorophyll in Vancouver and Thunder Bay No. 1 Canada export shipments are expected to remain lower than the 2002-03 values (Table 6).

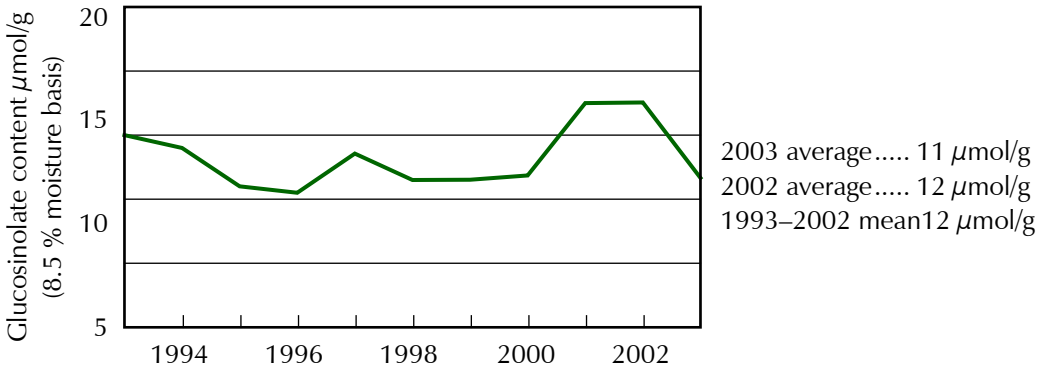
Figure 5 – No. 1 Canada canola
Chlorophyll content of harvest survey samples, 1993–2003



Glucosinolate content

The 2003 total seed glucosinolate level of 11 micromoles per gram is slightly lower than the 12 µmol/g in 2002. The large proportion of *Brassica napus* samples in the 2003 crop contributed to the overall low glucosinolate levels for the crop. For 2003, drought caused a slight increase in some areas. The average level of total seed glucosinolates in the November 2003 Vancouver and Thunder Bay canola exports indicates glucosinolate levels in exports should remain similar to those in the 2002-03 shipping season.

Figure 6 – No. 1 Canada canola
Total seed glucosinolate content of harvest survey samples, 1993–2003

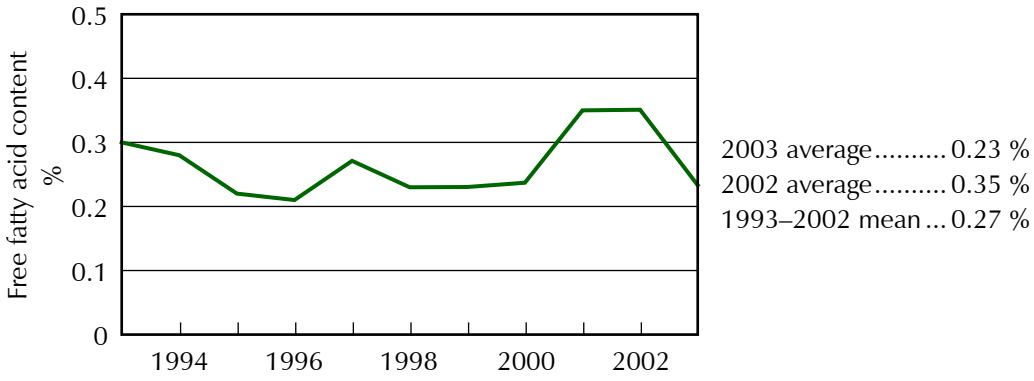


Free fatty acid content

The 2003 harvest survey of No. 1 Canada canola had an average free fatty acid (FFA) content of 0.23%. This level is lower than the 2002 value of 0.35% but similar to the long-term mean of 0.27%. The FFA content of 0.29% for Saskatchewan seed is higher than the 0.18% in Manitoba samples and the 0.21% in Alberta samples. Individual producer samples from some areas are notably higher in FFA (e.g. 0.6% to 1.0%) than the reported western Canada mean of 0.23%. For 2003, FFA levels are only slightly higher in the lower grade canola samples, indicative of the relatively low amounts of sprout or heat damaged seed found in those grades this season. FFA levels for 2003-04 No. 1 Canada exports are expected to be around 0.6% (Table 6).

In some of the drought areas there were reports of germination within the canola pods. The GRL initiated a study in 2000 to examine in detail the relationship between various quality parameters and the incidence of sprouted seed. Sprouted and high FFA samples from the 2001 and 2002 surveys were also added to the study. In general, sprouting does result in reduced oil contents and higher FFA values. However, our results on the relationship between FFA and percentage sprouting suggest that FFA alone is not a reliable predictor of "% sprout damage" in canola seed.

Figure 7 - No. 1 Canada canola
Free fatty acid content of harvest survey samples, 1993–2003



Fatty acid composition

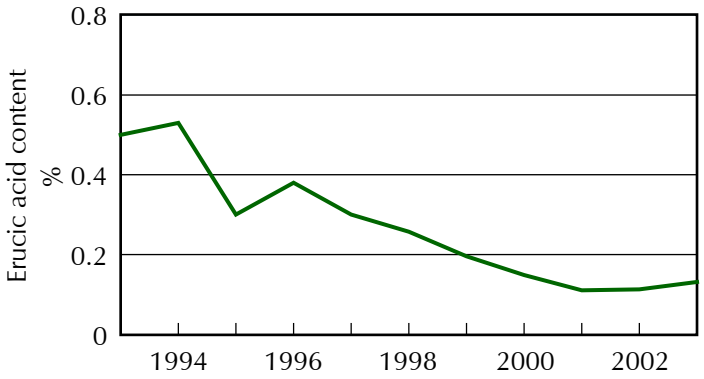
The mean iodine value of the canola oil from 2003 harvest survey samples was 110 units compared to 115 units in 2002 (Table 1). The mean linolenic acid was 8.4% in 2003, which is lower than both the 10.6% in 2002 and the 10-year mean of 10.2%. At 9.7%, the linolenic acid in Alberta was higher than in Saskatchewan, 7.7%, and Manitoba, 7.9%. The linolenic acid content of No. 1 Canada canola from producers in western Canada varied from 4.6% to 15.1%. The mean oleic acid content of the 2003 crop increased to 63.2% from 60.6% in 2002. The oleic acid content of No. 1 Canada canola from producers in western Canada varied from 54.3% to 69.5%.

The mean level of erucic acid in the 2003 crop was 0.13%, similar to the 0.11% in 2002 and well below the 10-year mean of 0.28%. The mean level of saturated fatty acids is 7.3% in 2003, higher than the 2002 value of 7.0%. The levels of saturated fatty acids are significantly lower in Alberta, 6.9%, than in Saskatchewan, 7.4%, and Manitoba, 7.4%. The saturated fatty acid content of No. 1 Canada canola from producers in western Canada varied from 5.2% to 8.4%.

Samples from the GRL harvest survey indicate the 2003 crop was comprised of 98% *Brassica napus* types compared to 97% in 2002. This, plus the extreme drought in large portions of the canola growing area contributed to the overall higher saturated fatty acid content in the 2003 crop. Of particular note this growing season was that both day and night temperatures were extremely high for a long periods of time. This likely caused the canola plants to reduce the amount of unsaturation in the oil. One needs to consider that the plant's objective in making the oil unsaturated is to give a more liquid (i.e. unsaturated) oil at lower temperatures. To do this, it has evolved mechanisms in the form of enzyme systems that are more active in making the oil unsaturated when the weather is cool and less active when it is hot.

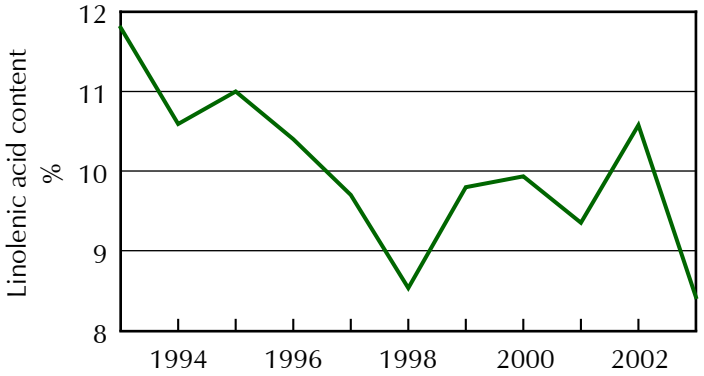
Based on the November 2003 data, the linolenic acid content for Vancouver No. 1 Canada canola exports decreased by 1.0% to 9.4%. The linolenic acid content of the November 2003 Thunder Bay exports decreased by 1.5% to 8.4%. At 111 units, the iodine value for Vancouver canola exports decreased by 3 units from the 2002-03 levels. The iodine value for November Thunder Bay canola exports also decreased by 3 units from the 2002-03 level. The level of saturated fatty acids in November 2003 canola exports was similar to the 2002-03 exports (Table 6). The levels of erucic acid in canola exports during the 2003-04 shipping season should remain around 0.2%.

Figure 8 – No. 1 Canada canola
Erucic acid content of harvest survey samples, 1993–2003



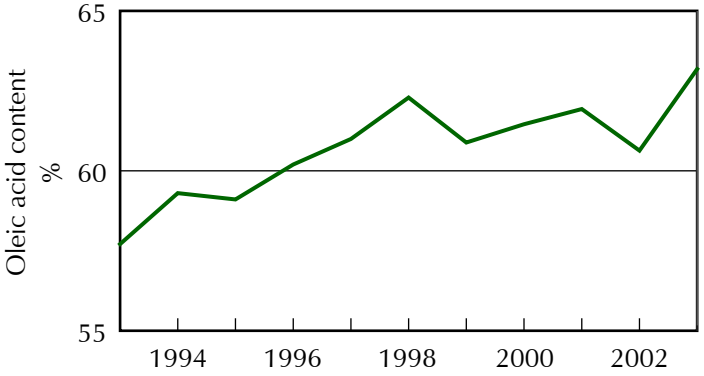
2003 average..... 0.13%
2002 average..... 0.11%
1993–2002 mean 0.28%

Figure 9 - No. 1 Canada canola
Linolenic acid content of harvest survey samples, 1993–2003



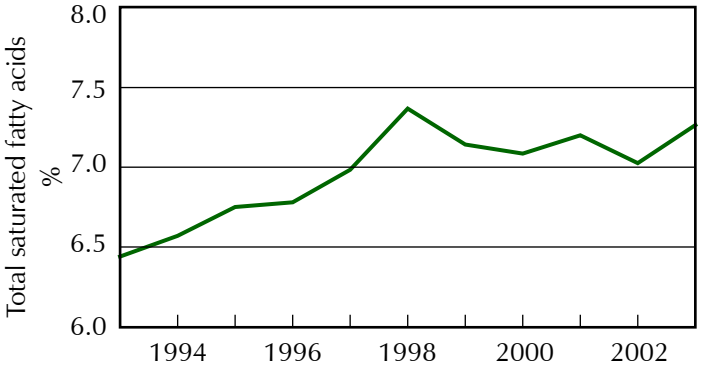
2003 average..... 8.4%
2002 average..... 10.6%
1993–2002 mean 10.2%

Figure 10 – No. 1 Canada canola
Oleic acid content of harvest survey samples, 1993–2003



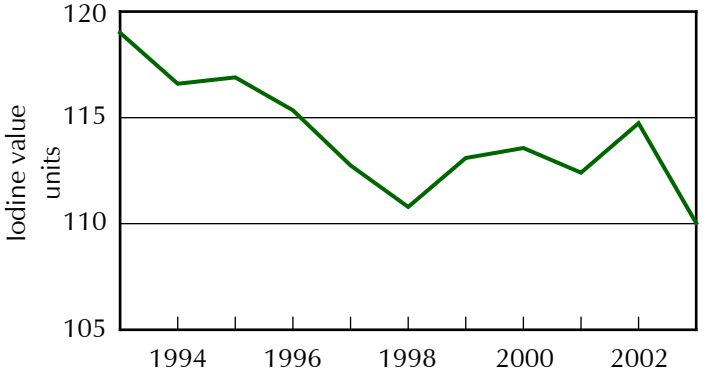
2003 average..... 63.2%
2002 average..... 60.6%
1993–2002 mean 60.5%

Figure 11 – No. 1 Canada canola
Total saturated fatty acids of harvest survey samples, 1993–2003



2003 average..... 7.3%
2002 average..... 7.0%
1993–2002 mean 6.9%

Figure 12 – No. 1 Canada canola
Iodine value of harvest survey samples, 1993–2003



2003 average.....110
2002 average.....115
1993–2002 mean 115