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Quality of Australian Canola 2009-10

AOF Australian Oilseeds Federation

Quality of Australian Canola 2009

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Acknowledgments

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Introduction

Sample Analysis

Canola samples representing the 2009 harvest were received from the bulk handlers in New South Wales, South Australia, Victoria and Western Australia. These samples are representative of the seed collected at each of their receival points and have been taken to cumulatively represent the Australian harvest. The Industry & Investment NSW Australian Oils Research Laboratory has no control over the collection of the samples and all data given is based on the analysis of the samples provided. In Western Australia, receival sites were bulked together to form composite samples. Results are reported for the group of sites each composite sample represents.

Each sample was analysed for oil, protein and glucosinolate concentrations; fatty acid profiles and volumetric grain weights according to the standard AOF methods outlined in the methods section at the back of this report. The Industry & Investment NSW Australian Oils Research Laboratory in Wagga Wagga performed all analyses on the samples. Oil and glucosinolate concentrations are reported at 6 % moisture in whole seed and protein is reported in oil-free meal at 10 % moisture.

Results from the National Variety Trials (NVT) have been included at the end of this report. National Variety Trials are funded by the Grains Research and Development Corporation (GRDC) to provide independent information to growers about newly released crop varieties. The results in this report are from samples submitted to the Australian Oils Research Laboratory in Wagga Wagga from the South Australian, Victorian and Western Australian trials. As particular varieties are not grown in all states some data are not available.

Weather and Production Review

The Season

For the first time since 2002 most canola growing districts across Australia experienced a favourable start to the growing season. This resulted in the majority of the crop being sown within or very close to the recommended planting window. However, despite the positive start, most districts in Victoria, New South Wales and parts of South Australia had limited sub soil moisture levels at sowing time. Rainfall during the growing season, therefore, played a significant role in determining yield results at harvest time.

Western Australia: Patchy rain during May produced a staggered seedling emergence in the central and northern districts but good falls of rain in all districts in June and July saw crops progressing into spring in good condition. Short term waterlogging in early August caused a temporary set back to crops in the higher rainfall areas of the Kwinana and Albany production zones. On the positive side, this resulted in excellent subsoil moisture levels for the remainder of the growing season.

Favourable rainfall and temperature conditions prevailed throughout flowering and pod-fill, enhancing yield prospects. Although isolated frosts and hail storms were recorded in some districts, there was only minimal impact on crop yields and no effect on grain quality. State wide there were very few incidences of insect pests or diseases throughout the growing season which increased the yield potential.

Due to the generally favourable conditions experienced throughout the growing season, harvest yields in most districts were equal to the long term average. The final production estimates for Western Australia for the 2009 season were 986,000 tonnes of seed from a harvested area of 745,000 ha. This, however, was a decrease in both yield and total production from the 2008 season, which was around 1,138 million tonnes from a harvested area of 620,000 ha. The generally favourable growing conditions, especially the mild temperatures, experienced during pod and seed development in spring, also resulted in seed oil contents being slightly above the long term average.

South Australia: Timely rain in all districts just prior to the start of the sowing period produced good sowing conditions, resulting in the crop being sown on time. However, below average autumn rain limited the build up of sub soil moisture levels in the South East and Mallee regions. This impacted on grower planting intentions and reduced the final area sown in both regions.

Very good rainfall across all districts during winter established the possibility of a good finish. Milder than normal winter temperatures were also beneficial, with flowering starting earlier than normal in early to mid July in the Mid North and Eyre Peninsula regions. The favourable mild seasonal conditions extended right through the important flowering and pod-fill period during spring. Crops also benefitted from the lack of any significant disease or insect problems throughout the season. Fortunately, the onset of heatwave conditions during November was too late to impact on crops. South Australia produced above average yields and higher than normal seed oil contents which reportedly ranged from 38 to 49 %.

Final estimated production for South Australia for the 2009 season was 259,000 tonnes of seed from a harvested area of 184,000 ha. By comparison production in 2008 was estimated at 227,000 tonnes from a harvested area of 165,000 ha.

Victoria: Reasonable rainfall was recorded in late April in most regions which enabled sowing to start on time. However, a lack of subsoil moisture in the Mallee, North East, Central North and the northern section of the Wimmera significantly reduced the area sown. Consistent follow up rainfall

was recorded throughout the winter period resulting in favourable conditions for crop growth and built up subsoil moisture in all regions.

Spring conditions were ideal for crops with cool temperatures and good rainfall during the important flowering and pod-fill periods of plant development, setting crops up for excellent yield potentials. Unfortunately, heatwave conditions, which occurred across Victoria in early November, had an adverse impact on many crops. Crops that had not been windrowed in the North East, Central North, sections of the Wimmera and the Western Districts regions were particularly affected. It was estimated that overall state yields were reduced by around 13 % due to the heatwave conditions.

Final estimated production for Victoria for 2009 was 391,000 tonnes from a harvested area of 234,000 ha. This was the highest production level for six years. In the 2008 season production was estimated at 251,000 tonnes of seed from the 185,000 ha harvested although 220,000 ha were estimated to have been sown indicating the significant impact of the drought last year.

New South Wales: All canola growing areas experienced good April rain which enabled the majority of the crop to be sown within the recommended planting window. However, drying soil moisture conditions, surface crusting and frosts caused a patchy emergence in some crops sown at the end of the planting window. Despite good follow-up rain in late May and June across most of New South Wales, subsoil moisture levels remained well below optimum in all districts. The exception was the northern section of the North West region around Walgett, which experienced above average rainfall in late summer/ early autumn. This resulted in a record area being planted.

Rainfall for July and August was below average resulting in subsoil moisture levels being further depleted and increasing the reliance on good spring rainfall to maintain crops. Average rainfall combined with cooler temperatures during September and early October across New South Wales were generally beneficial for crops during flowering and the early stages of pod development. As occurred in South Australia and Victoria, New South Wales experienced heatwave conditions in late October/ early November. This combined with the moisture stress caused by the lack of subsoil moisture, brought the season to a premature close with the state experiencing its earliest ever harvest. Only a small proportion of the total crop that was planted was lost. This was in spite of the difficult growing conditions experienced across much of New South Wales, particularly the western sections of the Central West and South West Slopes regions. The mild early spring temperatures enabled many crops yield slightly better than pre-harvest expectations. The moisture stress conditions impacted on the seed oil contents. However, despite the detrimental effects of the heatwave, there were some reports of oils levels well above the minimum quality standard of 42 %.

Final estimated production for New South Wales for 2009 was 261,000 tonnes from a harvested area of 227,000 ha out of the 240,000 ha estimated to have been sown. In the 2008 season final production was estimated at 262,000 tonnes from a harvested area of 195,000 ha out of the 225,000 ha sown.

As a consequence of the seasonal conditions, the reported incidence of diseases was very low in all states. Likewise there were few insect pest problems experienced except in New South Wales. Outbreaks of aphids and heliothis caterpillars occurred on moisture stressed crops in the spring with many affected crops requiring control measures. Late germinations of weeds also caused some control problems in the eastern states. Some observers report that the weed spectrum is changing with more intensive cropping practices.

The run of poor seasons when combined with the high costs involved in successful canola crop production have made growers in New South Wales wary of committing to large scale canola planting in 2010. The better harvest results in each of the other states combined with predicted continuing low returns from wheat production will maintain grower interest in canola production.

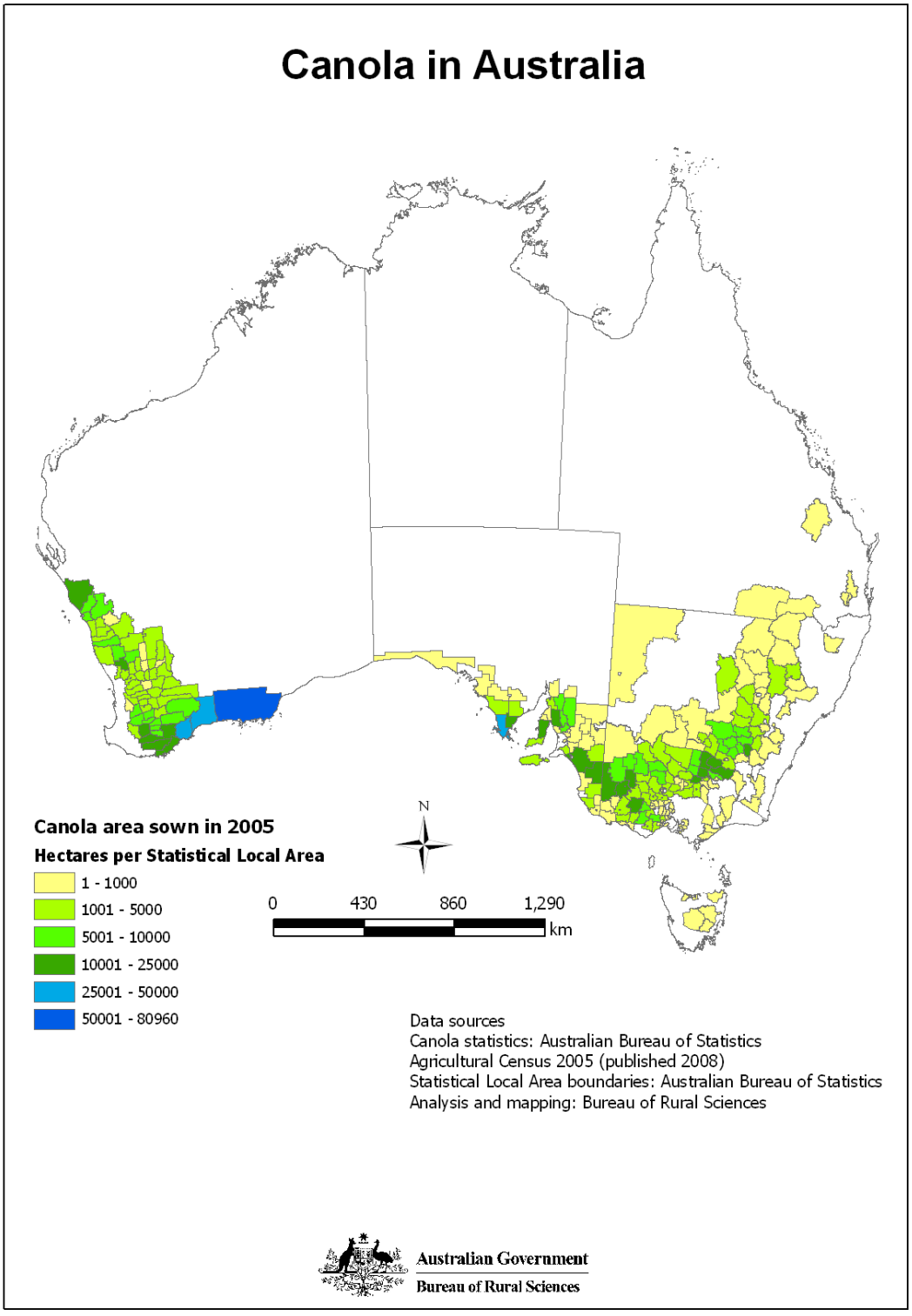

Figure 1: Areas of canola production in Australia
Published with approval of Bureau of Rural Sciences

Yield

The 2009 canola harvest was slightly larger than the 2008 harvest. In 2009 there was 1,390,000 hectares planted, this was 225,000 hectares more than 2008. A lower yield, however, resulted in only a slight increase from the 1,878,000 tonnes harvested in 2008 to the 1,897,000 tonnes harvested in 2009. The yield varied from a state average of 1.1 t/ha in New South Wales to 1.7 t/ha in Victoria. The national yield of 1.4 t/ha was 0.2 t/ha lower than the 2008 average.

Table 1: Canola production in Australia by state 2009

State	Production (kilotonnes)	Area (kilohectares)	Average Yield (tonnes/hectare)
New South Wales	261	227	1.1
Victoria	391	234	1.7
South Australia	259	184	1.4
Western Australia	986	745	1.3
Australia	1897	1390	1.4

Source: AOF Crop Report March 2010

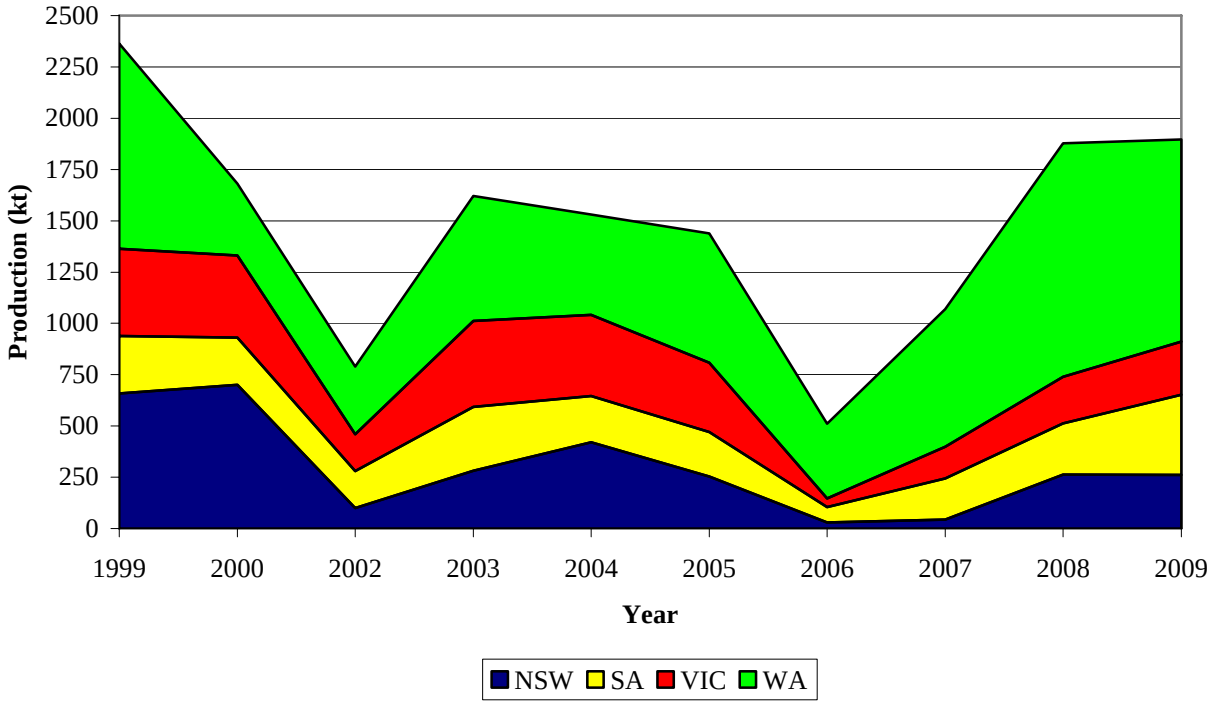

Figure 2: Canola Production in Australia 1999 – 2009

Australian Quality Parameter Summary

The region, zone, state and Australian mean values for all analyses are calculated on the basis of the tonnage that each site represents. However, due to tonnages being confidential information, no individual site tonnages can be reported.

Table 2: Average quality of Australian canola 2009

Quality Parameter	Australian Mean
Oil content, % in whole seed @ 6 % moisture	41.6
Protein content, % in oil-free meal @ 10 % moisture	40.1
Glucosinolates, µmoles/g in whole seed @ 6 % moisture	9
Volumetric grain weights, lbs/b	53.6
kg/hL	66.8
Oleic acid concentration (C18:1), % in oil	61.6
Linoleic acid concentration (C18:2), % in oil	19.3
Linolenic acid concentration (C18:3), % in oil	9.9
Erucic acid concentration (C22:1), % in oil	< 0.1
Saturated fatty acid concentration, % in oil	7.9
Iodine Value	113.3

Oil Content

The average oil content for the 2009 harvest was 41.6 %. This was a decrease of 0.2 % from the 2008 harvest and continues the fall of the past two years from 2007's record high. This is the lowest oil content since 2004. Oil content ranged from a low of 35.9 % at Red Bend in Central NSW to a high of 47.7 % at Cummins in the Eyre Peninsula region of South Australia.

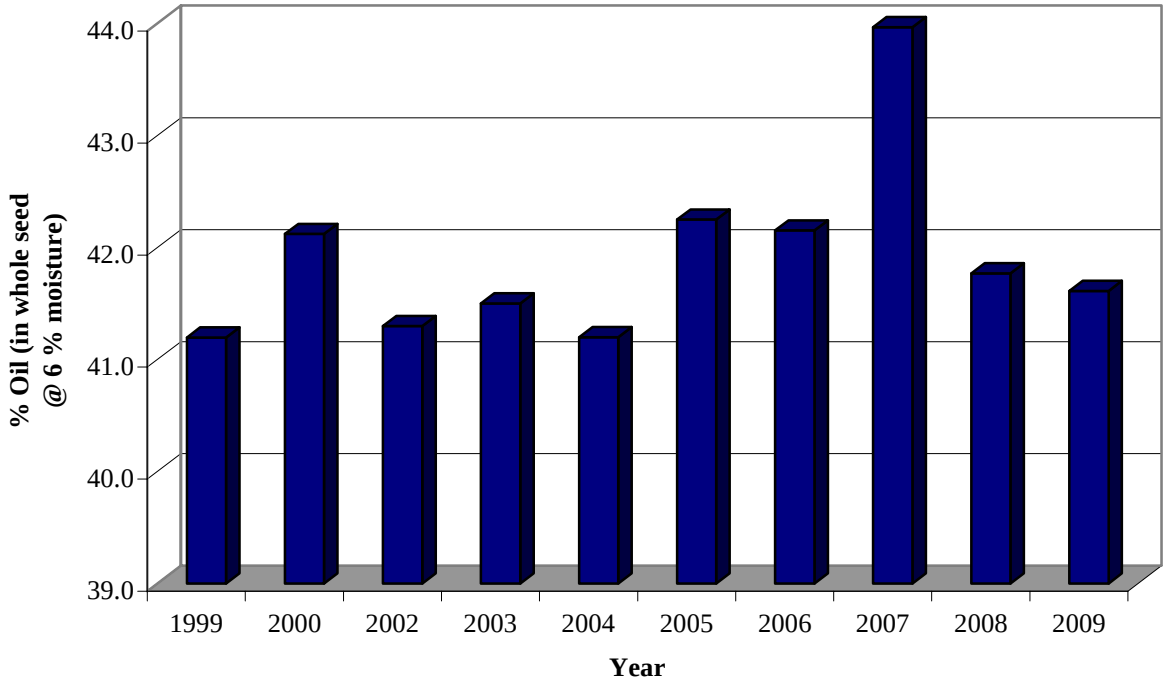

Figure 3: Average Australian oil content 1999 – 2009

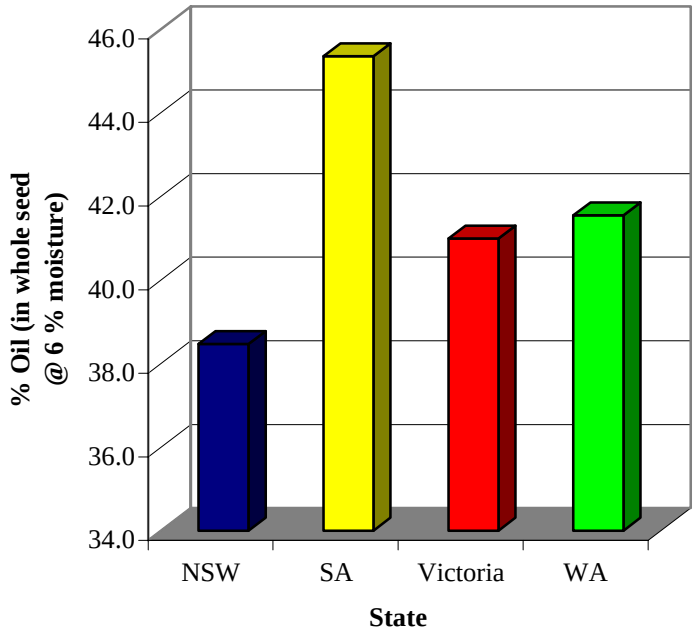

Figure 4: Average oil content by state 2009

Protein Content

The average protein content for the 2009 harvest was 40.1 % in oil free meal. This was a decrease of 0.9 % from the 2008. Protein content ranged from 37.2 % at Tarlee in the Mid North region of South Australia to 45.4 % at Parkes ST in Central NSW.

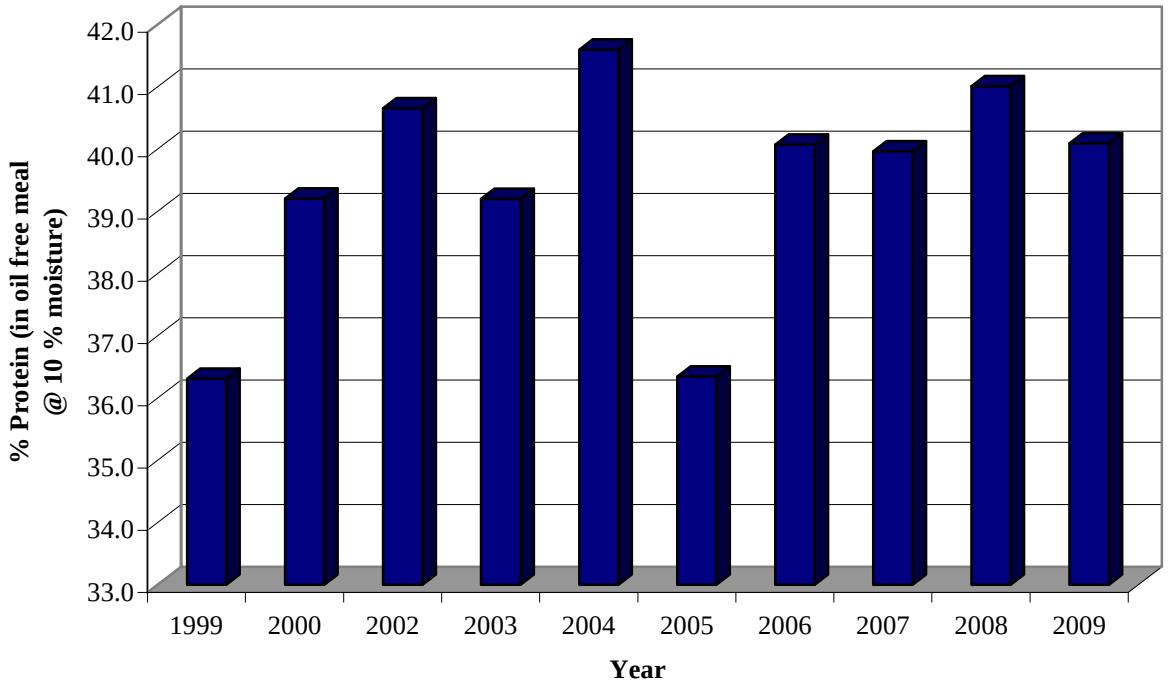

Figure 5: Average Australian protein content 1999 – 2009

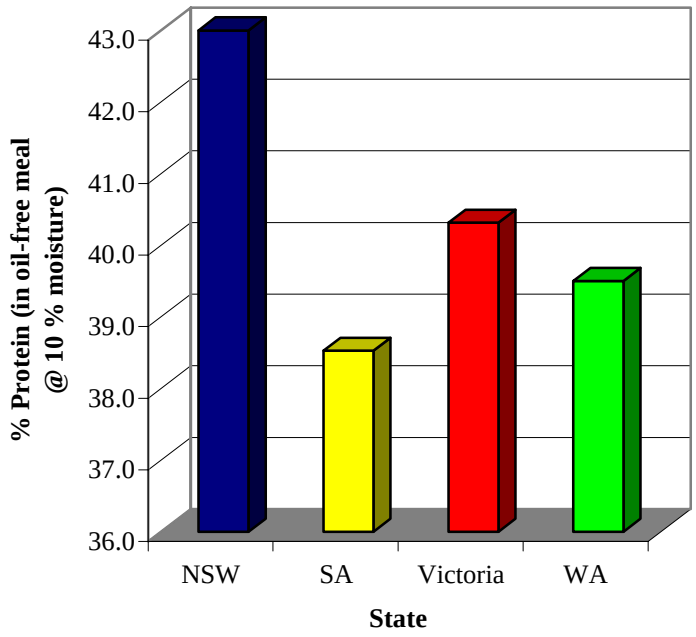

Figure 6: Average protein content by state 2009

Glucosinolate Concentration

The average glucosinolate content for the 2009 harvest was 9 µmoles/g. This was a decrease of 1 µmole/g from the 2008. Glucosinolate content ranged from 4 µmoles/g at Wyalong in Southern NSW to 16 µmoles/g at Barellan in Southern NSW and Muronbung in Central NSW.

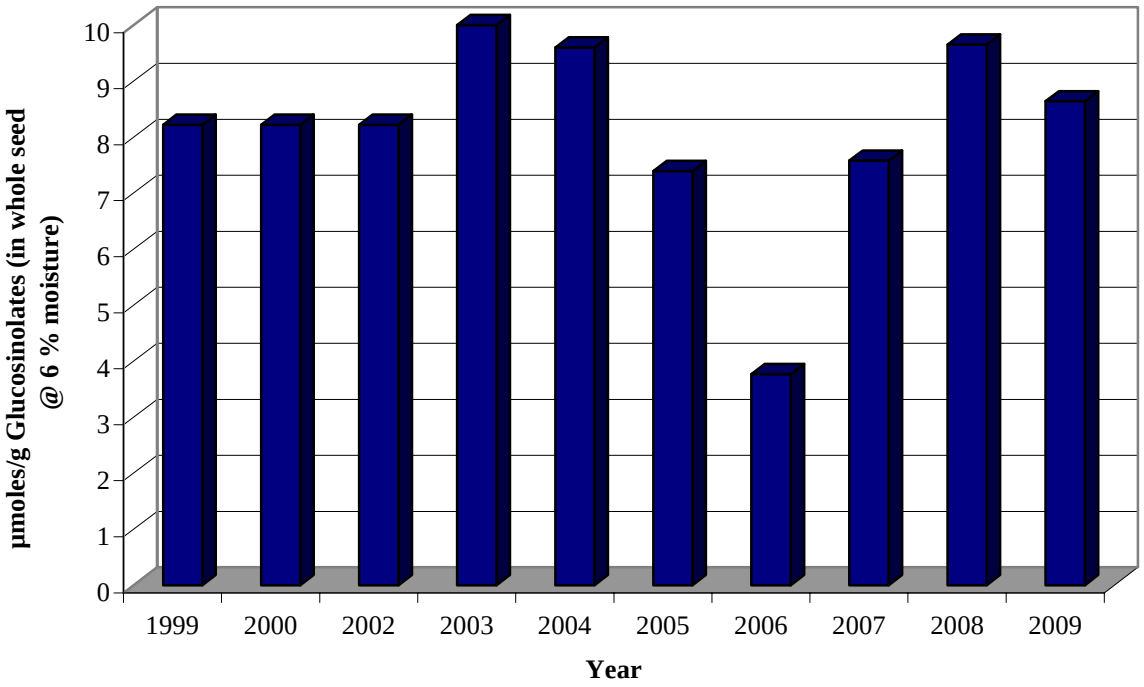

Figure 7: Average Australian glucosinolate content 1999 – 2009

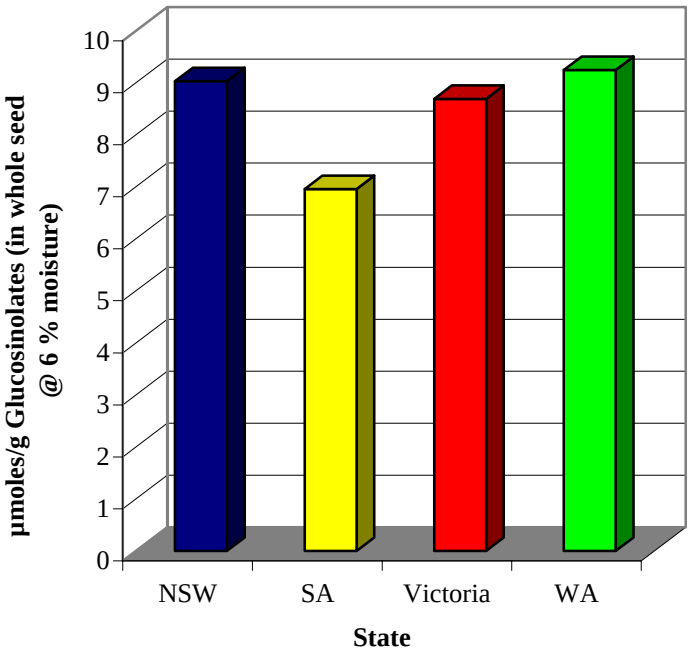

Figure 8: Average glucosinolate content by state 2009

Fatty Acid Composition

Oleic Acid

The average oleic acid (C18:1) concentration in the oil produced from the 2009 harvest was 61.6 %. This was 1.6 % higher than 2008 and the highest since the inception of this booklet in 1993. The concentration ranged from 55.8 % for the CANG (GM) grade at Mungeribar in Central NSW to 67.6 % at Coleambally in Southern NSW.

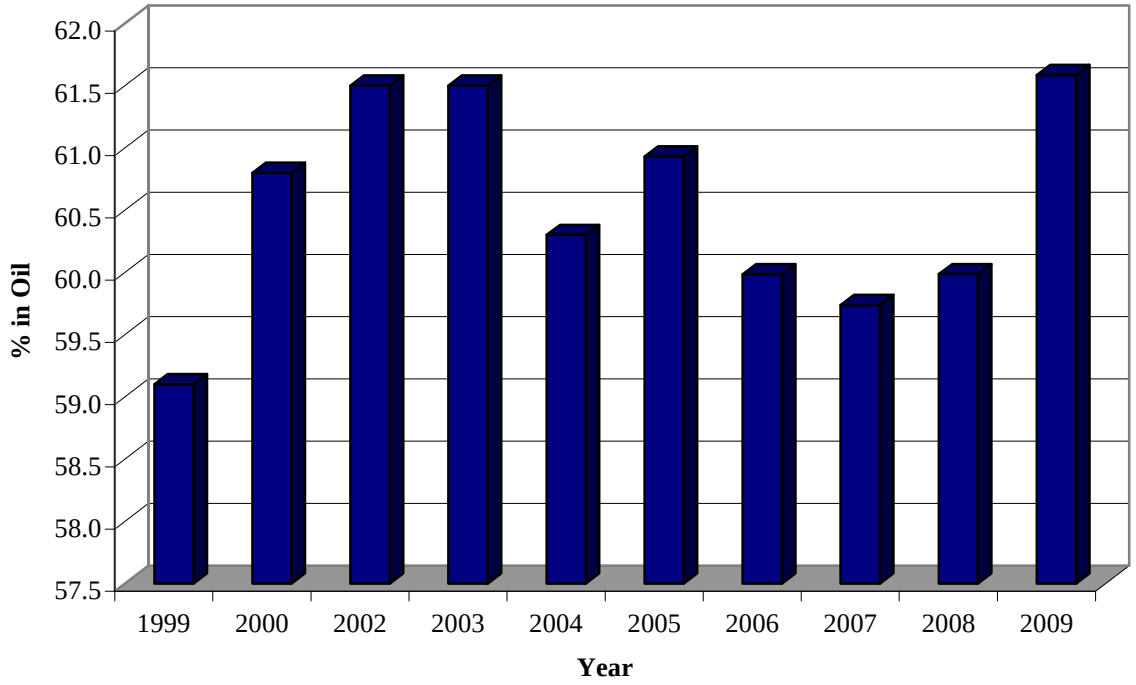

Figure 9: Average Australian oleic acid concentration in canola oil 1999 – 2009

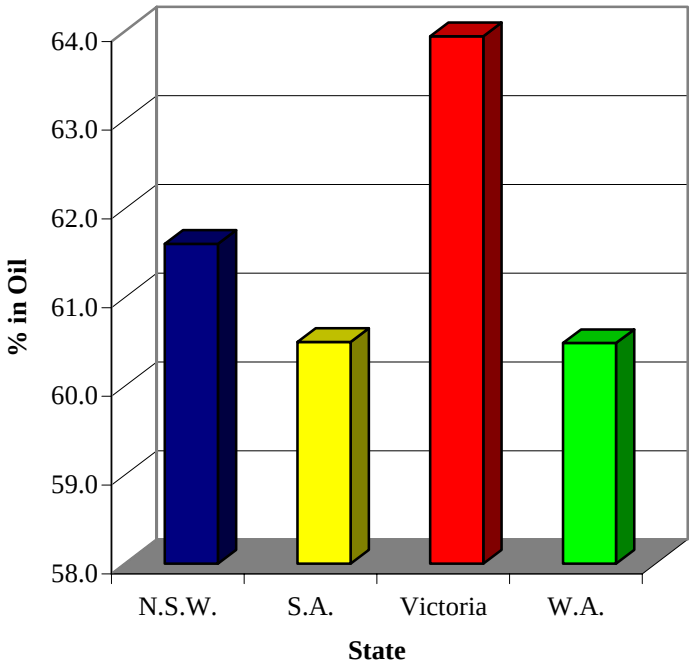

Figure 10: Average oleic acid concentration by state 2009

Linoleic Acid

The average linoleic acid (C18:2) concentration in oil produced from the 2009 harvest was 19.3 % this was 1.0 % lower than 2008 and the lowest since 1996. The concentration ranged from 13.9 % at Coleambally in Southern NSW to 22.3 % for the CANG (GM) grade at Mungeribar in Central NSW.

Linolenic Acid

There was a decrease of 0.8 % in the linolenic acid (C18:3) concentration to 9.9 %. This was the lowest since 2003. Linolenic acid concentrations ranged from 4.0 % at Muronbung in Central NSW to 13.1 % at Tailem Bend in South East South Australia and Quambatook in North West Victoria.

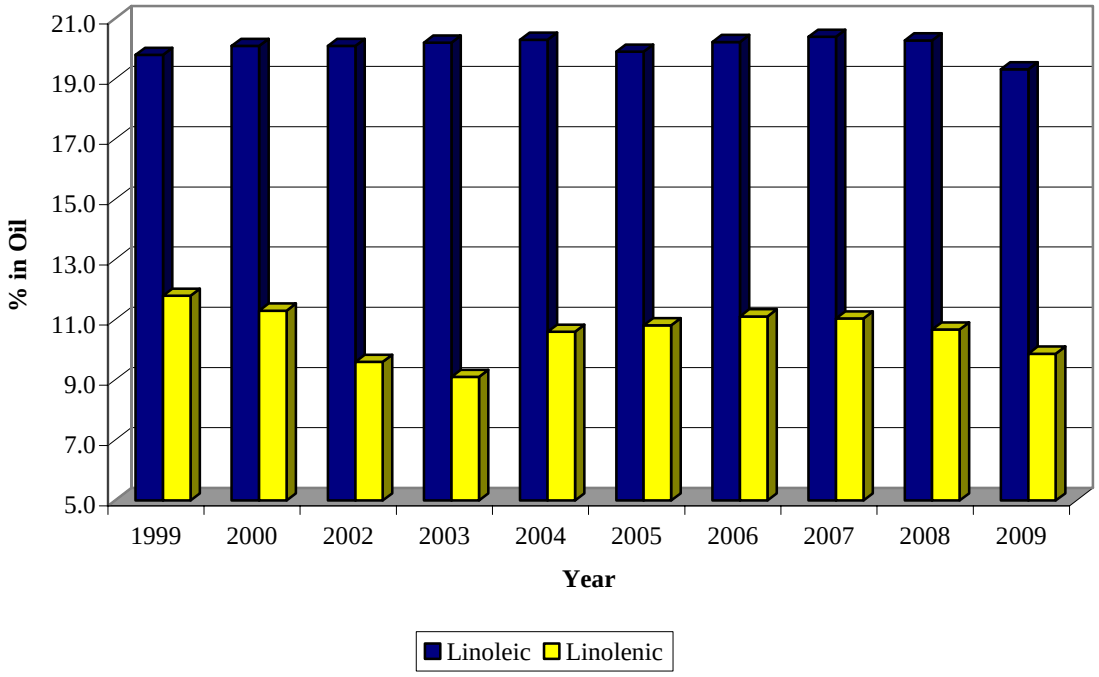

Figure 11: Average Australian linoleic acid and linolenic concentration in canola oil 1999 – 2009

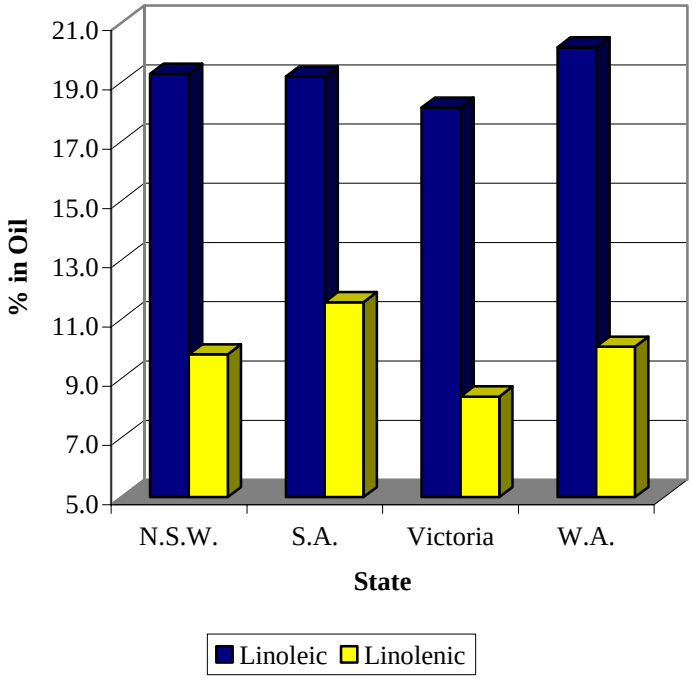

Figure 12: Average linoleic acid and linolenic acid concentration by state 2009

Saturated Fatty Acid

Saturated fatty acid concentration is the sum of individual saturated fatty acids – myristric acid (C14:0), palmitic acid (C16:0), stearic acid (C18:0), arachidic acid (C20:0), behenic acid (C22:0) and lignoceric acid (C24:0). The average saturated fatty acid concentration was 7.9 %. This was a 0.3 % increase from the 2009 harvest and the highest since 1995 following four successive increases. Saturated fatty acid concentration ranged from 7.0 % at Cummins in South Australia to 8.7 % in Lubeck in North West Victoria and Westmere in South east Victoria.

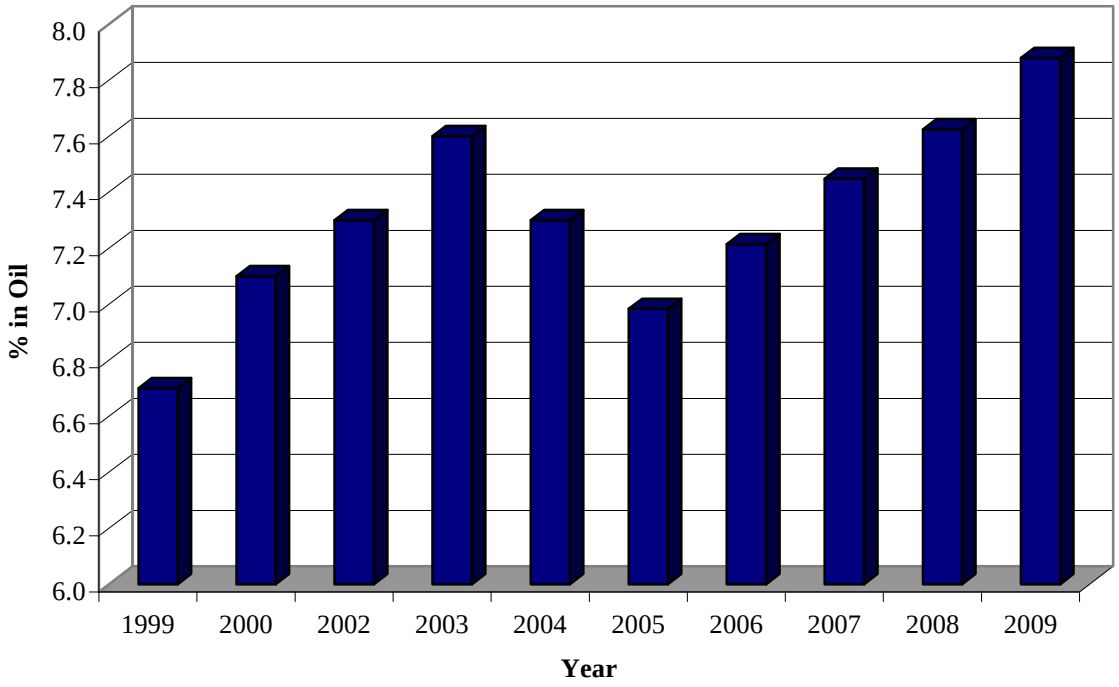

Figure 13: Average Australian saturated fatty acid concentration in canola oil 1999 – 2009

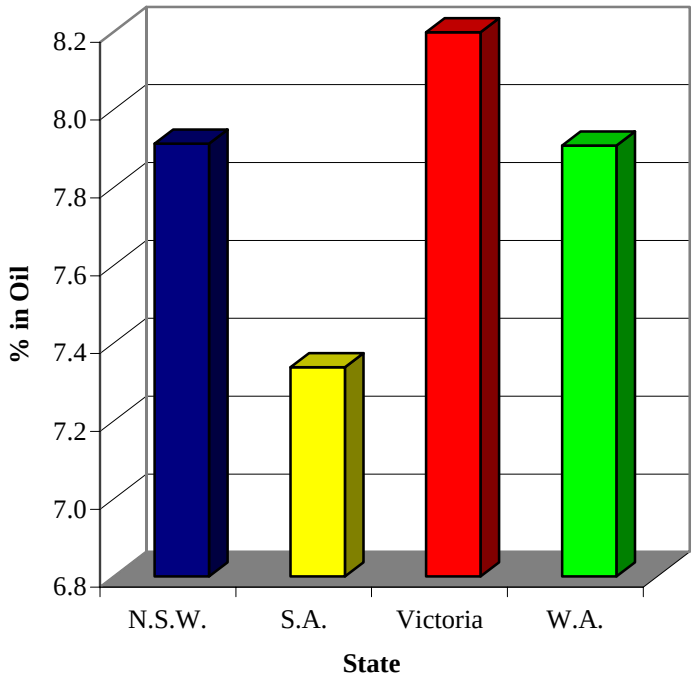

Figure 14: Average saturated fatty acid concentration by state 2009

Quality Data by State

Table 3: Quality Data – New South Wales

Region/ Zone/ Receival Site	Grade	[1] Oil	[2] Protein	[3] Glucosinolates µmoles/g	[4] Grain Weight lbs/b	kg/hL
Northern NSW						
Moree						
Moree	CAN	38.4	45.2	10	54.2	67.5
Narrabri						
Neilrex	CAN	39.9	43.7	10	53.4	66.5
Premer	CAN	40.7	41.9	10	53.6	66.8
Ulamambri	CAN	42.4	41.2	9	52.6	65.5
Willow Tree	CAN	38.1	44.2	10	53.2	66.3
Northern Mean		**39.0**	**43.8**	**10**	**53.5**	**66.7**
Central NSW						
Dubbo						
Curban	CAN	39.3	43.8	8	54.2	67.5
Gilgandra	CAN	39.1	44.2	8	54.6	68.0
Mungeribar	CAN	37.6	44.5	11	54.2	67.5
Mungeribar	CANG	36.1	44.7	9	54.0	67.3
Muronbung	CANH	38.1	41.8	16	54.0	67.3
Parkes						
Bribbaree	CAN	39.0	43.8	12	53.4	66.5
Caragabal	CAN	38.5	43.2	8	54.0	67.3
Condobolin	CAN	37.5	44.3	7	54.2	67.5
Cowra	CAN	41.4	43.3	7	52.6	65.5
Greenthorpe	CAN	38.5	43.2	10	52.3	65.3
Grenfell	CANG	39.9	43.4	9	53.2	66.3
Manildra	CAN	39.9	41.7	10	52.6	65.5
Milvale	CAN	40.2	41.1	8	53.4	66.5
Parkes ST	CAN	37.5	42.8	10	53.8	67.0
Parkes ST	CANG	39.7	45.4	11	52.8	65.8
Red Bend	CAN	35.9	44.1	9	54.4	67.8
Central Mean		**37.8**	**42.8**	**10**	**52.9**	**66.0**
Southern NSW						
Wagga						
Boorowa	CAN	40.1	42.1	9	53.0	66.0
Boree Creek	CAN	37.6	44.1	12	53.8	67.0
Coleambally	CAN	40.3	41.5	6	54.0	67.3
Coolamon	CAN	38.3	44.2	9	53.8	67.0
Cootamundra	CAN	39.1	43.0	8	52.8	65.8
Grong Grong	CAN	39.6	44.1	9	54.0	67.3
Harden	CAN	38.5	42.5	6	52.8	65.8
Henty West	CAN	38.0	42.3	8	54.0	67.3
Junee St	CAN	39.0	44.3	8	53.0	66.0
Lockhart	CANG	39.2	43.8	9	52.6	65.5
Maimuru	CAN	41.2	42.9	5	52.8	65.8
Milbrulong	CAN	39.1	42.6	14	54.0	67.3
Rand	CAN	41.5	43.0	11	52.8	65.8
Stockinbingal	CANG	41.2	41.0	7	53.4	66.5
Wyalong						
Ardlethan	CAN	38.4	45.1	8	53.8	67.0
Barellan	CAN	38.1	43.6	16	53.6	66.8
Temora	CAN	39.5	44.7	11	53.6	66.8
Wyalong	CAN	38.1	44.8	4	53.2	66.3
Southern Mean		**39.1**	**42.9**	**8**	**53.2**	**66.3**
N.S.W. Mean		**38.5**	**43.0**	**9**	**53.1**	**66.2**

[1] % in whole seed @ 6% moisture, [2] % in oil free meal @10% moisture, [3] µmoles/g in whole seed @ 6% moisture

[4] Volumetric Grain Weights- lbs/b: Pounds per bushel, kg/hL: Kilograms per hectolitre

Table 4: Quality Data – South Australia

Zone/ Region/ Receival Site	Grade	[1] Oil	[2] Protein	[3] Glucosinolates µmoles/g	[4] Grain Weight lbs/b	kg/hL
Port Adelaide						
Mid North						
Andrews	CANO	44.8	38.2	7	52.1	65.0
Bowmans	CANO	44.5	39.8	7	52.6	65.5
Kapunda	CANO	43.4	38.6	8	53.0	66.0
Roseworthy	CANO	43.5	39.2	5	53.4	66.5
Tarlee	CANO	45.1	37.2	8	52.6	65.5
South East						
Frances	CANO	41.6	38.8	7	53.4	66.5
Keith	CANO	41.9	38.7	7	53.4	66.5
Tailem Bend	CANO	43.6	40.4	10	53.8	67.0
Tintinara	CANO	43.2	37.6	10	53.8	67.0
Wolseley	CANO	41.7	37.9	6	53.8	67.0
Port Adelaide Mean		**43.5**	**39.0**	**7**	**53.2**	**66.3**
Port Giles						
Yorke Peninsula						
Ardrossan	CANO	46.1	38.7	7	52.1	65.0
Port Giles Mean		**46.1**	**38.7**	**7**	**52.1**	**65.0**
Port Lincoln						
Eyre Peninsula						
Cummins	CANO	47.7	38.0	5	52.6	65.5
Port Lincoln	CANO	46.6	38.1	8	53.4	66.5
Rudall	CANO	46.4	37.3	8	53.0	66.0
Ungarra	CANO	46.2	39.0	5	53.4	66.5
Yeelanna	CANO	46.9	37.3	8	53.4	66.5
Port Lincoln Mean		**47.3**	**38.0**	**6**	**52.9**	**65.9**
S.A. Mean		**45.4**	**38.5**	**7**	**52.9**	**66.0**

[1] % in whole seed @ 6% moisture, [2] % in oil free meal @10% moisture, [3] µmoles/g in whole seed @ 6% moisture

[4] Volumetric Grain Weights- lbs/b: Pounds per bushel, kg/hL: Kilograms per hectolitre

Table 5: Quality Data – Victoria

Region/ Zone/ Receival Site	Grade	[1] Oil	[2] Protein	[3] Glucosinolates µmoles/g	[4] Grain Weight lbs/b	kg/hL
North West Vic						
Horsham						
Buelah	CAN	42.3	41.0	5	53.8	67.0
Carpolac	CAN	41.3	39.4	9	53.0	66.0
Goroke	CAN	39.7	39.7	10	53.0	66.0
Horsham	CAN	40.9	38.5	12	52.1	65.0
Lillimur	CAN	39.4	38.6	12	54.2	67.5
Lillimur	CANG	41.8	38.0	9	53.4	66.5
Lubeck	CANG	41.4	38.8	10	51.9	64.8
Murta	CAN	40.8	39.4	9	52.3	65.3
Naracoorte	CAN	41.4	39.8	10	53.0	66.0
Natimuk	CAN	41.1	38.6	10	53.2	66.3
Nhill	CAN	41.7	38.6	7	53.0	66.0
Warracknabeal	CAN	42.5	41.6	5	53.2	66.3
Swan Hill						
Quambatook	CAN	41.1	43.7	7	54.2	67.5
Swan Hill	CAN	42.4	41.6	6	52.6	65.5
North West Mean		**41.1**	**39.7**	**9**	**53.2**	**66.3**
South East Vic						
Marong						
Berrybank	CAN	39.4	41.3	7	53.4	66.5
Borung	CAN	41.5	39.5	8	52.3	65.3
Donald	CAN	42.3	38.5	6	52.8	65.8
Dookie	CAN	40.5	41.9	12	54.2	67.5
Dunolly	CAN	38.9	39.4	12	52.8	65.8
Echuca	CAN	39.7	41.7	12	53.6	66.8
Elmore	CAN	40.9	40.0	12	53.0	66.0
Hamilton	CAN	40.6	40.6	10	52.8	65.8
Murchison East	CAN	42.8	40.1	9	52.6	65.5
Oaklands	CAN	39.7	43.1	10	53.6	66.8
Skipton	CAN	40.9	40.9	8	53.4	66.5
St James	CANG	41.1	42.1	6	52.8	65.8
Tocumwal	CAN	44.9	39.0	5	50.9	63.5
Wangamong	CANG	40.6	43.6	9	52.3	65.3
Westmere	CAN	41.8	40.4	7	53.6	66.8
Willaura	CAN	42.8	39.6	8	52.3	65.3
Yarrawonga	CAN	40.3	41.0	9	53.2	66.3
South East Mean		**40.9**	**40.7**	**9**	**53.1**	**66.2**
Victoria Mean		**41.0**	**40.3**	**9**	**53.1**	**66.2**

[1] % in whole seed @ 6% moisture, [2] % in oil free meal @10% moisture, [3] µmoles/g in whole seed @ 6% moisture

[4] Volumetric Grain Weights- lbs/b: Pounds per bushel, kg/hL: Kilograms per hectolitre

Table 6: Quality Data – Western Australia

Port Zone / Receival Site(s)	Grade	[1] Oil	[2] Protein	[3] Glucosinolates µmoles/g	[4] Grain Weight lbs/b	[4] Grain Weight kg/hL
Albany						
Borden Cranbrook Tambellup	CAN1 (75%) CAN2 (25%)	39.9	42.1	11	53.8	67.0
Boyup Brook Kojonup Bokal Katanning Wagin	CAN1	41.0	38.9	7	54.2	67.5
Gairdner Jacup Jerramungup Kojaneerup Wellstead Albany	CAN1	41.9	40.7	7	54.2	67.5
Karlgarin Lake Grace Nyabing	CAN1	39.9	41.4	13	55.2	68.8
Esperance						
Beaumont Cascades	CAN1 (QA)	42.1	39.4	9	55.4	69.0
Beaumont Cascades Esperance	CAN1	41.8	38.6	8	55.0	68.5
Ravensthorpe West Rover Lake Varley	CAN1	41.0	40.3	11	55.6	69.3
Geraldton						
Northampton Yuna Mingenew Carnamah Geraldton Terminal	CAN1	42.7	38.8	12	54.2	67.5
Kwinana						
Coomberdale Moora Piawanning Regans Ford Yerecoin Konnogorring McLevie	CAN1	41.5	38.2	11	53.4	66.5
Koorda Nembudding Hines Hill Kellerberrin Carrabin	CAN1	39.0	39.8	11	55.2	68.8

[1] % in whole seed @ 6% moisture, [2] % in oil free meal @10% moisture, [3] µmoles/g in whole seed @ 6% moisture

[4] Volumetric Grain Weights- lbs/b: Pounds per bushel, kg/hL: Kilograms per hectolitre

Table 6 (Continued): Quality Data – Western Australia

Port Zone				[3] Glucosinolates	[4] Grain Weight	
Receival Site(s)	**Grade**	[1] **Oil**	[2] **Protein**	**µmoles/g**	**lbs/b**	**kg/hL**
Metro Grain Centre	CAN1 (GM)	45.7	39.4	5	53.0	66.0
Narembeen Bulyee Yarding Wickepin	CAN1	37.9	38.6	11	55.0	68.5
Quairading York Brookton Dale Narrakine	CAN1	42.0	38.8	9	53.8	67.0
W.A. Mean		**41.5**	**39.5**	**9**	**54.3**	**67.7**

[1] % in whole seed @ 6% moisture, [2] % in oil free meal @10% moisture, [3] µmoles/g in whole seed @ 6% moisture

[4] Volumetric Grain Weights- lbs/b: Pounds per bushel, kg/hL: Kilograms per hectolitre

Fatty Acid Composition by State

Table 7: Fatty Acid Composition – New South Wales

Region/ Zone/ Receival Site	Grade	14:0	16:0	16:1	18:0	18:1	18:2	18:3	20:0	20:1	22:0	22:1	24:0	24:1	Total	[1] Sat.	[2] Iodine Value
Northern NSW																	
Moree																	
Moree	CAN	0.1	4.4	0.3	2.1	62.0	19.5	10.0	0.5	0.8	0.1	< 0.1	0.1	0.1	100	7.3	114.3
Narrabri																	
Neilrex	CAN	0.1	5.2	0.3	2.0	61.5	19.0	10.2	0.5	0.9	0.2	< 0.1	0.1	0.1	100	8.0	113.5
Premer	CAN	0.1	4.9	0.3	2.1	61.9	18.7	10.2	0.5	1.0	0.2	0.1	0.1	0.1	100	7.8	113.4
Ulamambri	CAN	0.1	4.9	0.3	1.7	62.1	18.3	10.4	0.4	1.2	0.2	0.3	0.1	0.1	100	7.4	113.6
Willow Tree	CAN	0.1	5.0	0.2	2.1	61.6	18.9	10.5	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.9	114.0
Northern Mean		**0.1**	**4.8**	**0.3**	**2.0**	**61.8**	**19.0**	**10.3**	**0.5**	**0.9**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**7.6**	**113.9**
Central NSW																	
Dubbo																	
Curban	CAN	0.1	5.3	0.4	2.0	59.7	20.1	11.0	0.4	0.7	0.1	< 0.1	0.1	0.1	100	8.0	115.8
Gilgandra	CAN	0.1	4.8	0.3	2.0	59.4	20.4	11.4	0.5	0.8	0.2	< 0.1	0.1	0.1	100	7.6	117.1
Mungeribar	CAN	0.1	5.3	0.3	1.9	59.5	20.0	11.4	0.4	0.8	0.1	< 0.1	< 0.1	0.1	100	7.9	116.5
Mungeribar	CANG	0.1	5.9	0.4	2.0	55.8	22.3	11.9	0.4	0.9	0.2	< 0.1	0.1	0.1	100	8.6	118.9
Muronbung	CANH	0.1	5.0	0.3	2.0	65.6	20.8	4.0	0.6	1.1	0.3	< 0.1	0.1	0.1	100	8.1	104.1
Parkes																	
Bribbaree	CAN	0.1	5.0	0.3	1.9	60.5	19.7	10.7	0.4	1.1	0.2	0.1	0.1	0.1	100	7.6	115.2
Caragabal	CAN	0.1	4.9	0.3	1.8	60.0	19.5	11.0	0.5	1.2	0.2	0.1	0.1	0.1	100	7.6	115.7
Condobolin	CAN	0.1	4.9	0.3	2.0	62.1	19.3	9.6	0.4	0.9	0.2	0.1	0.1	0.1	100	7.6	113.0
Cowra	CAN	0.1	5.2	0.4	2.2	58.7	20.6	11.2	0.4	0.8	0.1	< 0.1	0.1	0.1	100	8.2	116.6
Greenthorpe	CAN	0.1	4.7	0.3	2.1	61.6	19.8	9.4	0.5	1.0	0.2	0.1	0.1	0.1	100	7.7	112.9
Grenfell	CANG	0.1	5.0	0.3	2.2	62.4	19.1	8.9	0.5	1.0	0.2	< 0.1	0.1	0.1	100	8.1	111.2
Manildra	CAN	0.1	4.8	0.2	2.1	64.3	17.9	8.7	0.5	0.9	0.2	0.1	0.1	0.1	100	7.8	110.1
Milvale	CAN	0.1	4.9	0.2	2.1	64.6	17.4	8.9	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.9	109.9
Parkes ST	CAN	0.1	5.6	0.4	1.9	59.5	19.6	11.2	0.4	0.9	0.2	< 0.1	0.1	0.1	100	8.3	115.6
Parkes ST	CANG	0.1	5.2	0.3	1.9	61.2	19.9	9.9	0.4	0.8	0.1	< 0.1	0.1	0.1	100	7.8	114.0
Red Bend	CAN	0.1	5.2	0.4	2.0	58.3	20.6	11.9	0.4	0.9	0.2	< 0.1	0.1	0.1	100	7.9	118.0
Central Mean		**0.1**	**5.1**	**0.3**	**2.0**	**60.6**	**19.7**	**10.5**	**0.5**	**0.9**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**7.9**	**114.7**
Southern NSW																	
Wagga Wagga																	
Boorowa	CAN	0.1	4.9	0.3	2.1	65.9	17.1	7.5	0.5	1.0	0.2	0.1	0.1	0.1	100	7.9	107.2
Boree Creek	CAN	0.1	4.9	0.4	1.8	58.9	20.3	11.5	0.5	1.1	0.2	0.1	0.1	0.1	100	7.7	117.1
Coleambally	CAN	0.1	4.9	0.3	1.7	67.6	13.9	9.3	0.5	1.1	0.3	< 0.1	0.1	0.1	100	7.5	107.9
Coolamon	CAN	0.1	5.2	0.3	1.9	59.6	19.9	11.1	0.5	0.9	0.2	0.1	0.1	0.1	100	8.0	115.9
Cootamundra	CAN	0.1	5.3	0.3	2.2	62.6	19.3	8.3	0.5	0.9	0.2	0.1	0.1	0.1	100	8.4	109.9
Grong Grong	CAN	0.1	4.8	0.4	1.9	61.0	18.9	11.1	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.6	115.2
Harden	CAN	0.1	4.9	0.4	2.3	63.8	18.2	8.2	0.6	1.1	0.2	0.1	0.1	0.1	100	8.2	109.1
Henty West	CAN	0.1	5.2	0.2	2.2	63.1	19.4	8.1	0.5	0.9	0.2	0.1	< 0.1	0.1	100	8.2	110.0
Junee St	CAN	0.1	4.7	0.3	1.9	60.6	19.9	10.3	0.5	1.1	0.2	0.2	0.1	0.1	100	7.5	114.9
Lockhart	CANG	0.1	5.2	0.3	2.4	63.2	18.8	8.4	0.5	0.9	0.2	< 0.1	< 0.1	0.1	100	8.4	109.7
Maimuru	CAN	0.1	4.5	0.3	2.3	64.1	18.1	8.4	0.5	1.1	0.2	0.2	0.1	0.1	100	7.8	109.7
Milbrulong	CAN	0.1	4.9	0.3	2.0	60.8	19.6	10.2	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.8	114.2
Rand	CAN	0.1	4.9	0.3	1.9	60.9	19.6	10.5	0.4	1.0	0.2	< 0.1	0.1	0.1	100	7.6	114.9
Stockinbingal	CANG	0.1	5.1	0.3	2.4	64.9	18.6	7.0	0.5	0.9	0.2	< 0.1	0.1	0.1	100	8.3	107.2
Wyalong																	
Ardlethan	CAN	0.1	4.9	0.3	1.8	57.7	20.7	12.5	0.5	1.1	0.2	0.1	0.1	0.1	100	7.6	119.3
Barellan	CAN	0.1	4.9	0.3	1.9	59.6	20.0	11.1	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.7	116.2
Temora	CAN	0.1	4.9	0.3	1.8	60.0	19.7	11.0	0.5	1.1	0.2	0.1	0.1	0.1	100	7.6	115.8
Wyalong	CAN	0.1	5.3	0.5	2.2	57.7	20.7	12.0	0.4	0.8	0.1	< 0.1	0.1	0.1	100	8.2	118.1
Southern Mean		**0.1**	**5.0**	**0.3**	**2.2**	**62.7**	**18.9**	**8.9**	**0.5**	**1.0**	**0.2**	**0.1**	**0.1**	**0.1**	**100**	**8.0**	**111.1**
N.S.W. Mean		**0.1**	**5.0**	**0.3**	**2.1**	**61.6**	**19.3**	**9.8**	**0.5**	**0.9**	**0.2**	**0.1**	**0.1**	**0.1**	**100**	**7.9**	**113.1**

[1] Sat - Sum of the saturated fatty acids including 14:0, 16:0, 18:0, 20:0 and 24:0

[2] Iodine Value - Calculated from the fatty acid composition

Table 8: Fatty Acid Composition – South Australia

Zone/ Region/ Receival Site	Grade	14:0	16:0	16:1	18:0	18:1	18:2	18:3	20:0	20:1	22:0	22:1	24:0	24:1	Total	[1] Sat.	[2] Iodine Value
Port Adelaide																	
Mid North																	
Andrews	CANO	0.1	4.9	0.4	1.8	61.7	19.1	10.4	0.4	0.9	0.2	< 0.1	0.1	0.1	100	7.5	114.2
Bowmans	CANO	0.1	4.8	0.3	1.8	60.3	19.4	11.7	0.4	0.9	0.2	< 0.1	0.1	0.1	100	7.3	117.0
Port Lincoln	CANO	0.1	4.9	0.4	1.6	61.6	17.8	11.8	0.4	1.0	0.2	0.1	0.1	0.1	100	7.3	115.7
Roseworthy	CANO	0.1	5.0	0.3	1.7	58.6	19.7	12.7	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.6	118.9
Yeelanna	CANO	0.1	4.7	0.2	1.7	61.4	18.4	11.8	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.2	116.4
South East																	
Frances	CANO	0.1	5.2	0.3	2.3	65.2	16.8	8.3	0.5	0.9	0.2	< 0.1	0.1	0.1	100	8.3	107.9
Kapunda	CANO	0.1	4.7	0.3	2.1	61.4	19.9	9.8	0.5	0.9	0.3	< 0.1	0.1	0.1	100	7.7	113.7
Tailem Bend	CANO	0.1	4.7	0.3	1.7	58.1	20.3	13.1	0.4	1.0	0.2	< 0.1	0.1	0.1	100	7.1	120.4
Tintinara	CANO	0.1	4.9	0.3	2.1	59.5	19.9	11.5	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.8	116.7
Wolseley	CANO	0.1	5.2	0.3	2.0	59.8	20.5	10.3	0.5	0.9	0.2	< 0.1	0.1	0.1	100	8.0	114.9
Port Adelaide Mean		**0.1**	**4.9**	**0.3**	**1.8**	**60.4**	**19.2**	**11.5**	**0.5**	**0.9**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**7.4**	**116.5**
Port Giles																	
Yorke Peninsula																	
Ardrossan	CANO	0.1	4.8	0.2	1.7	60.9	18.4	12.3	0.4	0.9	0.2	< 0.1	< 0.1	0.1	100	7.2	117.2
Port Giles Mean		**0.1**	**4.8**	**0.2**	**1.7**	**60.9**	**18.4**	**12.3**	**0.4**	**0.9**	**0.2**	**< 0.1**	**< 0.1**	**0.1**	**100**	**7.2**	**117.2**
Port Lincoln																	
Eyre Peninsula																	
Cummins	CANO	< 0.1	4.4	0.3	1.7	60.6	19.1	11.9	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.0	117.3
Keith	CANO	0.1	5.1	0.4	2.1	60.5	19.9	10.3	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.0	114.5
Rudall	CANO	0.1	4.9	0.3	1.6	59.3	19.6	12.3	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.4	118.1
Tarlee	CANO	0.1	4.6	0.3	2.0	60.4	20.4	10.4	0.5	1.0	0.2	0.1	0.1	0.1	100	7.4	115.5
Ungarra	CANO	0.1	4.7	0.3	1.7	58.5	20.5	12.5	0.4	0.9	0.2	0.1	0.1	0.1	100	7.1	119.5
Port Lincoln Mean		**0.1**	**4.6**	**0.3**	**1.8**	**60.5**	**19.4**	**11.5**	**0.5**	**1.0**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**7.2**	**116.7**
S.A. Mean		**0.1**	**4.7**	**0.3**	**1.8**	**60.5**	**19.2**	**11.6**	**0.5**	**0.9**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**7.3**	**116.6**

[1] Sat - Sum of the saturated fatty acids including 14:0, 16:0, 18:0, 20:0 and 24:0

[2] Iodine Value - Calculated from the fatty acid composition

Table 9: Fatty Acid Composition – Victoria

Region/ Zone/ Receival Site	Grade	14:0	16:0	16:1	18:0	18:1	18:2	18:3	20:0	20:1	22:0	22:1	24:0	24:1	Total	[1] Sat.	[2] Iodine Value
North West Vic																	
Horsham																	
Buelah	CAN	0.1	4.7	0.3	1.9	58.2	20.5	12.7	0.4	0.8	0.1	< 0.1	0.1	0.1	100	7.3	119.8
Carpolac	CAN	0.1	5.1	0.3	2.4	66.1	16.6	7.7	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.4	106.7
Goroke	CAN	0.1	5.0	0.4	2.5	67.0	15.9	7.3	0.6	0.9	0.2	< 0.1	0.1	0.1	100	8.5	105.3
Horsham	CAN	0.1	5.3	0.2	2.5	65.9	17.1	7.3	0.5	0.7	0.2	< 0.1	0.1	0.1	100	8.6	106.2
Lillimur	CAN	0.1	5.0	0.4	2.4	63.9	18.0	8.4	0.6	0.9	0.2	< 0.1	0.1	0.1	100	8.4	109.1
Lillimur	CANG	0.1	5.4	0.3	2.3	61.9	19.7	8.8	0.5	0.7	0.2	< 0.1	0.1	0.1	100	8.5	111.1
Lubeck	CANG	0.1	5.2	0.3	2.7	66.1	16.8	7.2	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.7	105.6
Murta	CAN	0.1	5.1	0.3	2.6	66.6	16.2	7.3	0.6	0.8	0.2	< 0.1	0.1	0.1	100	8.6	105.4
Naracoorte	CAN	0.1	5.2	0.4	2.4	64.6	17.7	7.9	0.6	0.9	< 0.1	< 0.1	0.1	0.1	100	8.3	108.1
Natimuk	CAN	0.1	5.1	0.3	2.5	65.7	16.9	7.7	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.4	106.9
Nhill	CAN	0.1	5.2	0.2	2.1	62.1	19.4	9.3	0.4	0.8	0.2	< 0.1	0.1	0.1	100	8.1	112.2
Warracknabeal	CAN	0.1	5.2	0.3	2.0	58.3	20.8	11.7	0.4	0.8	0.0	0.1	0.1	0.1	100	7.7	118.0
Swan Hill																	
Quambatook	CAN	0.1	5.2	0.3	1.8	56.7	21.4	13.1	0.4	0.7	0.1	< 0.1	0.1	0.1	100	7.7	120.9
Swan Hill	CAN	0.1	5.0	0.4	1.9	58.7	19.6	12.7	0.4	0.8	0.1	0.1	0.1	0.1	100	7.6	118.8
North West Mean		**0.1**	**5.0**	**0.3**	**2.3**	**63.3**	**18.1**	**9.1**	**0.5**	**0.8**	**0.2**	**0.0**	**0.1**	**0.1**	**100**	**8.2**	**110.6**
South East Vic																	
Marong																	
Berrybank	CAN	0.1	5.1	0.3	2.3	66.3	17.4	7.0	0.5	0.7	0.2	< 0.1	0.1	0.1	100	8.3	106.3
Borung	CAN	0.1	5.2	0.3	1.9	64.6	16.9	9.4	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.8	110.5
Donald	CAN	0.1	5.3	0.3	2.2	62.1	19.1	9.4	0.4	0.7	0.2	< 0.1	0.1	< 0.1	100	8.3	112.0
Dookie	CAN	0.1	4.9	0.3	1.8	61.1	20.3	9.5	0.5	1.1	0.2	< 0.1	0.1	0.1	100	7.6	113.7
Dunolly	CAN	0.1	5.2	0.3	2.3	64.4	17.8	8.0	0.5	0.9	0.2	< 0.1	0.1	0.1	100	8.5	108.1
Echuca	CAN	0.1	4.9	0.3	1.8	61.4	19.4	10.0	0.5	1.0	0.2	0.1	0.1	0.1	100	7.6	113.8
Elmore	CAN	0.1	4.7	0.3	1.9	64.7	17.5	9.0	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.5	110.4
Hamilton	CAN	0.1	5.0	0.4	2.4	64.7	17.9	7.7	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.3	107.9
Murchison East	CAN	0.1	5.1	0.4	2.1	62.2	19.5	8.5	0.4	1.1	0.2	0.3	0.1	0.1	100	8.0	111.0
Oaklands	CAN	0.1	5.1	0.3	2.0	60.4	20.7	9.8	0.4	0.9	0.2	< 0.1	0.1	0.1	100	7.9	114.3
Skipton	CAN	0.1	5.2	0.3	2.4	65.0	18.1	7.2	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.5	107.0
St James	CANG	0.1	5.3	0.3	2.3	63.1	18.9	8.3	0.5	0.9	0.2	< 0.1	0.1	0.1	100	8.4	109.8
Tocumwal	CAN	0.1	5.0	0.3	1.9	63.9	17.6	9.6	0.4	0.8	0.2	< 0.1	0.1	0.1	100	7.6	111.5
Wangamong	CANG	0.1	5.2	0.4	2.4	61.9	19.0	9.3	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.4	111.6
Westmere	CAN	0.1	5.4	0.5	2.4	64.8	17.9	7.2	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.7	106.7
Willaura	CAN	0.1	4.9	0.4	2.4	66.3	17.0	7.2	0.5	0.9	< 0.1	< 0.1	0.1	0.1	100	8.0	106.4
Yarrawonga	CAN	0.1	5.0	0.3	2.0	60.6	20.6	9.7	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.7	114.3
South East Mean		**0.1**	**5.1**	**0.4**	**2.2**	**64.3**	**18.2**	**8.0**	**0.5**	**0.9**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**8.2**	**108.6**
Victoria Mean		**0.1**	**5.1**	**0.4**	**2.3**	**63.9**	**18.1**	**8.4**	**0.5**	**0.9**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**8.2**	**109.4**

[1] Sat - Sum of the saturated fatty acids including 14:0, 16:0, 18:0, 20:0 and 24:0

[2] Iodine Value - Calculated from the fatty acid composition

Table 10: Fatty Acid Composition – Western Australia

Port Zone/ Receival Site(s)	Grade	14:0	16:0	16:1	18:0	18:1	18:2	18:3	20:0	20:1	22:0	22:1	24:0	24:1	Total	[1] Sat.	[2] Iodine Value
Albany																	
Borden Cranbrook Tambellup	CAN1 (75%) CAN2 (25%)	0.1	4.9	0.3	2.1	60.8	20.0	9.8	0.5	0.9	0.2	0.1	0.1	0.1	100	8.0	113.7
Boyup Brook Kojonup Bokal Katanning Wagin	CAN1	0.1	5.1	0.4	2.2	61.0	20.2	9.4	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.1	113.2
Gairdner Jacup Jerramungup Kojaneerup Wellstead Albany	CAN1	0.1	5.1	0.3	1.9	59.9	20.6	10.2	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.9	115.1
Karlgarin Lake Grace Nyabing	CAN1	0.1	5.1	0.2	1.8	61.5	19.8	9.5	0.5	0.9	0.2	0.1	0.1	0.1	100	7.9	113.2
Esperance																	
Beaumont Cascades	CAN1 (QA)	0.1	4.8	0.3	1.9	59.9	20.0	10.8	0.6	1.1	0.3	0.1	0.1	0.1	100	7.8	115.6
Beaumont Cascades Esperance	CAN1	0.1	5.4	0.2	1.9	60.5	20.0	10.3	0.4	0.8	0.2	< 0.1	0.1	0.1	100	8.1	114.6
Ravensthorpe West Rover Lake Varley	CAN1	0.1	4.8	0.3	1.8	60.7	19.7	10.2	0.5	1.2	0.2	0.2	0.1	0.1	100	7.6	114.4
Geraldton																	
Northampton Yuna Mingenew Carnamah Geraldton Terminal	CAN1	0.1	4.9	0.3	1.7	59.4	20.8	11.0	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.4	116.9
Kwinana																	
Coomberdale Moora Piawanning Regans Ford Yerecoin Konnogorring McLevie	CAN1	0.1	4.7	0.3	2.3	60.7	19.9	9.9	0.5	1.1	0.3	< 0.1	0.1	0.1	100	7.9	113.7
Koorda Nembudding Hines Hill Kellerberrin Carrabin	CAN1	0.1	5.3	0.4	1.9	60.2	20.5	9.9	0.4	0.9	0.2	< 0.1	0.1	0.1	100	8.0	114.3

[1] Sat - Sum of the saturated fatty acids including 14:0, 16:0, 18:0, 20:0 and 24:0

[2] Iodine Value - Calculated from the fatty acid composition

Table 10 (Continued): Fatty Acid Composition – Western Australia

Port Zone/ Receival Site(s)	Grade	14:0	16:0	16:1	18:0	18:1	18:2	18:3	20:0	20:1	22:0	22:1	24:0	24:1	Total	[1] Sat.	[2] Iodine Value
Metro Grain Centre	CAN1 (GM)	0.1	5.1	0.3	2.1	61.7	19.1	10.1	0.4	0.8	0.2	< 0.1	0.1	0.1	100	8.0	113.4
Narembeen Bulyee Yarding Wickepin	CAN1	0.1	5.7	0.4	1.9	60.0	20.3	9.6	0.5	1.0	0.2	0.1	0.1	0.1	100	8.4	113.2
Quairading York Brookton Dale Narrakine	CAN1	0.1	5.1	0.2	2.2	62.0	19.6	9.1	0.5	0.8	0.2	< 0.1	0.1	0.1	100	8.2	111.9
W.A. Mean																	

[1] Sat - Sum of the saturated fatty acids including 14:0, 16:0, 18:0, 20:0 and 24:0

[2] Iodine Value - Calculated from the fatty acid composition

National Variety Trials – Quality Data

Table 11: NVT Quality Data

Variety	Oil (% in whole seed @ 6 % moisture)			Protein (% in oil free meal @ 10 % moisture)			Glucosinolates (µmoles/g in whole seed @ 6 % moisture)		
	SA	Vic	WA	SA	Vic	WA	SA	Vic	WA
06H933	42.5	40.9	*	36.7	37.6	*	13	9	*
ATR 409	44.4	41.3	*	40.4	39.6	*	10	7	*
ATR Barra	*	*	42.8	*	*	42.2	*	*	5
ATR Cobbler	43.6	39.1	41.9	39.8	39.4	40.0	11	14	12
ATR Marlin	44.2	40.1	41.1	40.8	40.2	39.5	7	9	10
AV-Garnet	45.5	41.2	42.6	37.6	39.0	38.7	10	11	10
Bravo TT	43.2	37.7	41.2	39.6	39.9	40.0	10	12	10
CB Argyle	45.2	40.2	43.2	41.8	41.6	42.2	5	9	5
CB Jardee HT	*	38.8	*	*	39.1	*	*	11	*
CB Mallee HT	*	38.2	*	*	39.4	*	*	8	*
CB Scaddan	41.7	37.9	40.5	38.8	38.5	39.4	7	8	6
CB Tanami	42.1	39.1	40.0	39.6	38.9	39.3	10	11	10
CB Telfer	43.8	39.6	42.2	41.2	39.8	40.9	6	8	6
CB Tumby HT	*	38.9	*	*	40.0	*	*	8	*
CHYB-166	*	*	43.7	*	*	37.6	*	*	4
GT61	*	*	43.1	*	*	38.1	*	*	6
Hurricane TT	44.3	41.6	43.2	41.9	41.5	43.8	7	8	6
Hyola 433	44.9	41.1	41.5	38.3	40.8	42.7	10	13	12
Hyola 50	44.8	40.0	41.6	38.7	39.9	41.8	8	8	8
Hyola 502RR	*	*	42.5	*	*	40.6	*	*	8
Hyola 571CL	43.8	39.7	42.4	39.0	38.8	40.5	12	13	15
Hyola 601RR	*	*	45.3	*	*	42.7	*	*	6
Hyola 76	45.4	41.0	43.6	39.3	38.6	43.7	9	8	9
Monola 130CC	42.3	39.0	*	37.1	36.5	*	12	10	*
Monola 76TT	45.0	41.5	44.7	39.9	38.9	40.3	8	7	6
Monola 77TT	45.8	40.4	*	40.3	39.2	*	5	7	*
Oasis CL	44.1	*	*	42.3	*	*	14	*	*
NG0021	*	*	42.5	*	*	37.4	*	*	14
NG0028	*	*	42.0	*	*	37.9	*	*	11
NG0157	*	*	43.1	*	*	39.6	*	*	10
NG0195	*	*	41.4	*	*	37.2	*	*	9
Pioneer 45Y82 (06N785I)	44.5	*	*	38.2	*	*	9	*	*
Pioneer 45Y82 (06N785I)	43.7	*	*	39.8	*	*	8	*	*
Pioneer 46Y83 (06N788I)	44.5	*	*	39.0	*	*	9	*	*
Pioneer 06N784I	44.9	42.1	43.2	39.5	39.2	40.1	7	6	7
Pioneer 06N785I	*	*	42.3	*	*	40.3	*	*	9
Pioneer 06N788I	*	*	43.0	*	*	40.7	*	*	7
Pioneer 08N019R	*	*	44.6	*	*	40.1	*	*	8
Pioneer 08N020R	*	*	43.3	*	*	38.9	*	*	7
Pioneer 08N028R	*	*	43.6	*	*	38.1	*	*	9
Pioneer 08N852R	*	*	45.4	*	*	40.1	*	*	7
Pioneer 43C80	44.7	40.3	39.7	40.3	45.8	39.9	7	11	7
Pioneer 44C79	44.7	41.4	43.4	40.1	41.1	40.2	8	8	7
Pioneer 45Y77	43.6	40.0	42.5	39.3	38.8	41.0	7	9	8
Pioneer 46Y20	*	41.8	45.6	*	37.6	41.2	*	8	7
Pioneer 46Y78	43.8	39.8	43.1	40.0	38.9	41.9	8	8	8
Pioneer 46Y83	*	41.2	*	*	38.2	*	*	7	*
RocketCL	*	*	42.2	*	*	43.8	*	*	5
Rottnest TTC	42.9	37.9	40.5	38.7	38.3	39.4	8	11	8
Sahara CL	41.2	*	*	44.2	*	*	23	*	*
T2196	42.5	38.7	41.8	40.2	39.6	41.3	6	9	6
T2475	40.1	*	*	41.1	*	*	8	*	*
Tarcoola	44.9	40.2	42.5	41.0	44.1	40.6	8	12	9
Tawriffic TT	44.8	40.7	43.6	40.7	40.7	41.7	6	7	6
ThunderTT	*	*	41.7	*	*	42.2	*	*	6
TTRIUMPH CHYB-125	42.6	*	41.5	39.6	*	40.2	9	*	9
TTRIUMPH CHYB-157	42.3	*	41.3	38.9	*	38.2	8	*	8
TTRIUMPH Jardee	42.7	*	41.1	39.4	*	39.6	8	*	9
V3001	42.4	38.4	*	37.0	36.7	*	11	12	*

* Variety not grown in NVTs in state.

Definition

Canola is a term used to describe seed of the species *Brassica napus or Brassica campestris*, the oil component of which seed contains less than 2 % erucic acid (C22:1) and the solid (meal) component of which seed contains less than 30 micromoles of any one of, or any mixture of, 3-butenyl glucosinolate, 4-pentenyl glucosinolate, 2-hydroxy-3-butenyl glucosinolate and 2-hydroxy-4-pentenyl glucosinolate per gram of air-dry, oil-free solid as measured by the gas chromatographic method of the Canadian Grain Commission (Canola Council, Winnipeg, Manitoba, Canada).

Methods

Moisture Content:

Moisture is determined on whole seed using a 6500 near infrared (NIR) spectrometer calibrated using AOF 4-1.6: “Moisture Content of Oilseeds Oven Method”. The moisture contents are used to convert the raw data for oil, protein and glucosinolates to the appropriate moisture content for reporting.

Oil Content:

Oil content is determined by NIR, calibrated from results obtained using method AOCS Am2-93 “Determination of Oil Content in Oilseeds”. Oil is extracted from ground seed on either a Foss Soxtec™ 2050 or a Büchi B-811 Extraction System using hexane for four hours. The sample is reground and extracted for 2 hours. The sample is again ground and extracted for a further 2 hours. The results are reported as a percentage of the seed at 6 % moisture.

Protein Content:

Protein content is determined on whole seed by NIR, calibrated from samples analysed by the LECO elemental analyser using AOF 4-3.3: “Protein, Crude, of Meals (Combustion)”. Results are reported as percent protein (Nitrogen x 6.25) and calculated to 10 % moisture in oil-free meal.

Glucosinolate Content:

Total glucosinolate concentration is determined by NIR, calibrated by method AOF 4-1.22: "Glucosinolate Content, Glucose Method, Canola and Rapeseed". The method involves an enzymatic hydrolysis to release glucose followed by a colorimetric reaction and determination by a UV-Vis spectrophotometer. The method has compared favourably with the HPLC methodology of the AOCS with the added advantage of speed and economy. Results are reported as µmoles glucosinolates/gram whole seed at 6 % moisture.

Fatty Acid Composition:

Fatty acid composition involves methylation of fatty acids with a methanolic solution of potassium hydroxide. The method is based on IOC COI/T.20/Doc. No. 24 2001: "Preparation of the Fatty Acid Methyl Esters from Olive Oil and Olive-Pomace Oil". The methyl esters are then separated on a gas chromatograph using a BPX70 capillary column. Fatty acids are reported as a percentage of the total fatty acids.

Iodine Values:

Iodine values are calculated from the fatty acid profile using AOF 4-2.14: "Iodine Value by Fatty Acid Composition".

Volumetric Grain Weights:

Volumetric grain weights are measured using a Franklin chrondrometer and reported as both pounds/bushel and kilograms/hectolitre.


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