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Quality of Australian Canola

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Quality of Australian Canola 2010

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Acknowledgments

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Introduction

Sample Analysis

Canola samples representing the 2010 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 NSW DPI 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.

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 book. The NSW DPI 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.

Weather Production Review

The Season

Weak wheat prices combined with firm price prospects for canola leading up to the start of the sowing period resulted in an increase in the area growers intended to sow to canola in all growing districts.

The 2010 season saw an excellent and timely start across New South Wales and Victoria following good summer rainfall but dry conditions resulted in a delayed start to sowing in some districts in South Australia and in Western Australia.

New South Wales: Good summer rainfall followed by further timely autumn rain resulted in the best start to the growing season for many years enabling 95% of the crop to be sown within the ideal sowing window. The mild conditions produced a rapid germination with many crops emerging within 5 days of planting. Unfortunately the mild conditions also suited plague locusts which caused significant damage to many seedling crops resulting in around 12,000 ha requiring resowing mainly on the western side of the central and southern regions.

All regions experienced almost ideal growing conditions throughout the winter period and the resultant excellent crop growth. This allowed the opportunity for grazing of some crops without any adverse impact on final yields. The continuation of mild temperatures throughout spring resulted in a long flowering period which set crops up for high yield and oil potential.

Unfortunately above average rainfall during October, November and December in most districts caused significant flooding or waterlogging of many crops particularly in the Riverina region. The resultant restriction of machinery access into paddocks caused long delays to the windrowing and/or harvest of crops across much of the state. As a consequence of the weather damage and the adverse impact on seed quality due to sprouted seed a new grade designated CAN3 was established to enable growers to deliver their grain. Despite this some samples were too badly weather damaged, mainly through low weight, to be accepted into this grade. The waterlogging also resulted in an estimated 5,000 ha of crop, mainly in southern NSW, being abandoned.

Final estimated production for New South Wales for 2010 was 610,000 tonnes from a harvested area of 310,000 ha. This is more that a 50% increase on the estimated 261,000 from a harvested area of 227,000 ha in 2009. The average yield of 1.97 t/ha is the highest ever achieved for the state.

Victoria: Good summer rainfall provided adequate soil moisture to ensure a strong start to the season despite below average rainfall being recorded in April and early May. Although mice, slugs and locusts caused some damage to early sown crops, good falls of rain in late May and throughout June minimised these problems and improved crop prospects. The good rain continued during July and August and combined with mild temperatures produced excellent vegetative growth setting the crop up for the prospects of above average yields.

Similar to NSW, most districts in Victoria experienced favourable growing conditions during flowering and grain fill from September to November further lifting yield prospects. The Western Districts, the traditional highest yielding region in the state, were the exception to this as excessive rain during October and early November caused extensive waterlogging of paddocks adversely impacting on many crops reducing yield potential and resulting in about 20,000 ha being lost to seed production although a small portion of this was cut for hay.

Heavy rain during December resulted in significant flooding in the Wimmera region and ongoing wet conditions in the Western Districts causing major delays to windrowing and harvesting in both regions. As a consequence of this many crops suffered weather damage with a significant tonnage of seed downgraded to CAN3 grade at delivery. However, despite this damage yields and seed oil levels for the state were still above average.

Final estimated production for Victoria for 2010 was 440,000 tonnes from a harvested area of 240,000 ha out of the 260,000 ha estimated to have been sown. This is slightly above the 2009 season production of 391,000 tonnes from a harvested area of 234,000 ha.

South Australia: The majority of regions were sown on time into adequate moisture and was generally completed by the end of May. The exception to this was the Eyre Peninsula, where a large area of crop was sown dry. In the Mallee region plague locusts caused significant damage to many seedling crops most of which were resown. Good rainfall and mild temperatures across all districts during the winter period from June through to mid August produced excellent crop growth enhancing the prospects of high crop yields. On the Eyre Peninsula an outbreak of Diamond Back Moth in late August required widespread control measures to be carried out.

Above average rainfall across all regions in late August followed by drier conditions and a continuation of mild temperatures in late September and early October benefitted all crops particularly in the Riverland and southern Mallee regions where crops were reported as being the best for many years. These were ideal conditions for the critical seed fill period further enhancing the prospects for above average yields and oil levels.

As happened in NSW and Victoria, rain during late November and early December brought the harvest across South Australia to a halt with the dense windrows taking considerable time to dry out. As a result weather damage, particularly sprouting and low weight, lead to a large quantity of seed being down-graded into the CAN3 grade.

Final estimated production for South Australia for the 2010 season was 360,000 tonnes from a harvested area of 200,000 ha. By comparison production in 2009 was 259,000 tonnes of seed from a harvested area of 184,000 ha.

Western Australia: In contrast to the other states Western Australia experienced very dry conditions until the first significant rain fell in most districts in early May. This delayed the start of sowing, although many growers took the opportunity to dry sow some crops. Suitable sowing rain did not occur in most districts until mid to late June. Despite the late start to the season, an increased area compared to the previous season was sown, mostly due to the better price prospects compared to wheat.

Winter rainfall during July and early August was below average in all districts. Crops in the South Coast and Esperance zones were able to maintain good growth on the limited moisture available but those in the Eastern and Northern regions suffered increasing levels of moisture stress with many crops showing significant wilting. A period of widespread rain in late August and early September provided only short term respite to crops as above average temperatures during late September and October combined with the dry season to result in one of the worst cropping years experienced in Western Australia in over 40 years. A consequence of the deteriorating conditions was that an estimated 30,000 ha of crop in the Albany and Kwinana zones were cut for hay for feeding to drought affected livestock.

Moderate but timely rain in the Albany to Esperance region in early November assisted crops in those areas to achieve slightly better than expected yields helping to lift overall state wide production. The final production estimate for Western Australia for the 2010 season were 705,000 tonnes from a harvested area of 845,000 ha. By comparison production for the 2009 season was 986,000 tonnes of seed from a harvested area of 745,000 ha.

Insects and Diseases

Waterlogging and wet harvest conditions rather than insect and disease problems were the major factors impacting on the final yield of crops and seed quality in all states except WA. A late growth of weeds brought on by the late spring-early summer rain added to the harvest difficulties experienced by growers.

Plague locusts were the major insect pest problem impacting on seedling crops in South Australia, Victoria and New South Wales. As a consequence of this damage an estimated total area of about 35,000ha of crop across all three states required resowing. An expected spring outbreak of plague locusts did not eventuate due to widespread control spraying that was undertaken by Government authorities as locusts hatched.

In South Australia an outbreak of Diamondback Moth occurred during winter on the Eyre Peninsula. The APVMA (the regulatory authority) granted an emergency application which allowed the use of appropriate control measures (including the use of a suitable insecticide). This combined with a spell of colder weather brought the outbreak under control with minimal impact on crop yields.

Whilst the overall level of disease was low in all canola growing regions across Australia, there were many reports of blackleg leaf lesions present on crops in New South Wales and Victoria during the winter period. Although this did develop into a low level of stem canker in some crops the mild conditions experienced during flowering and pod fill greatly minimised any impact on yields. The wet conditions during flowering were also conducive to the development of sclerotinia disease, causing a low level of diseased plants in many crops in NSW. The mild conditions experienced during pod development and seed fill again minimised the potential for any impact on yield.

Some mice damage was also observed in crops following sowing in Victoria. Early reports indicated that there has been a big build up in mice numbers in all the eastern states over the 2010-11summer which could pose problems for the 2011 crop season.

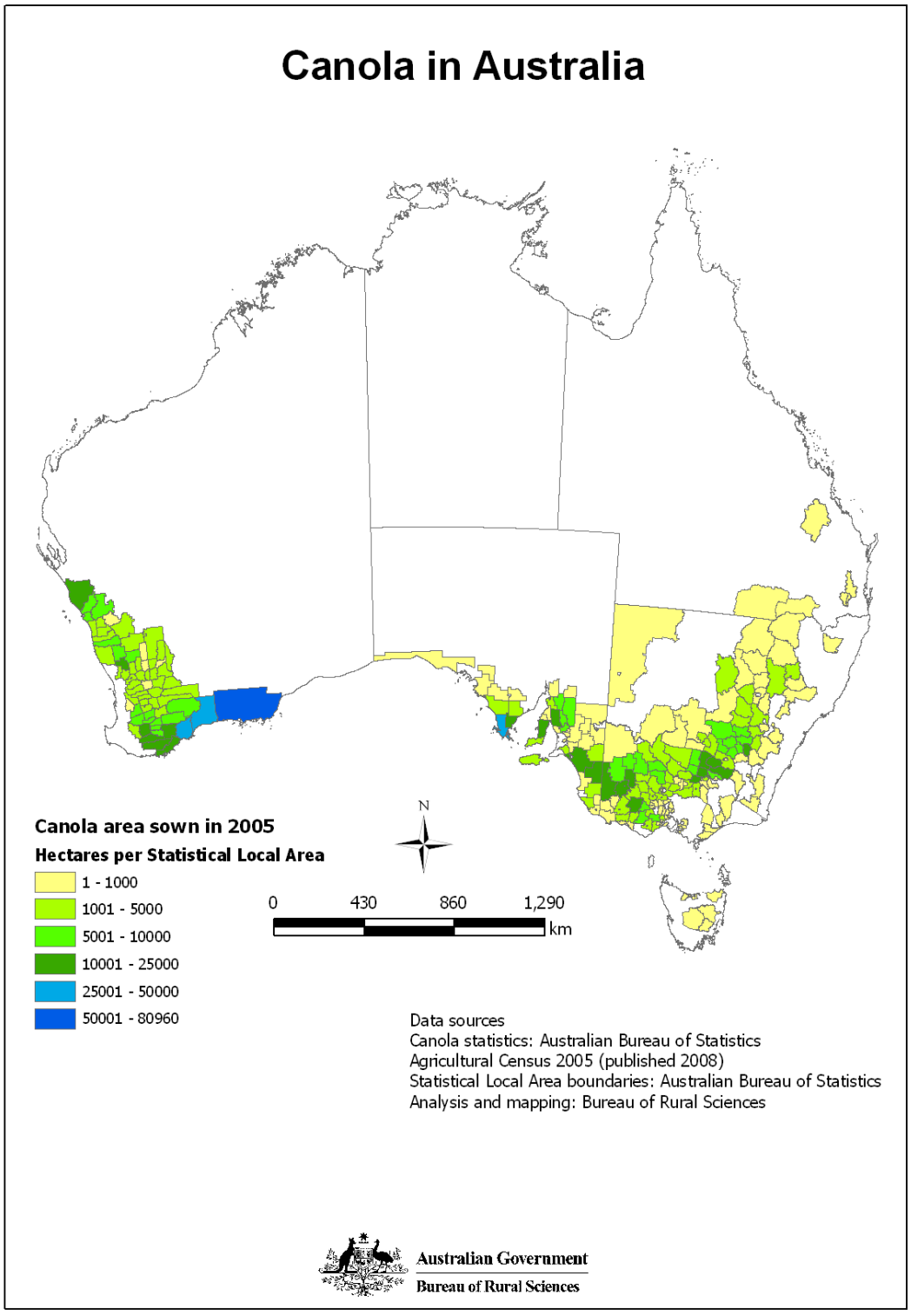

Figure 1: Areas of canola production in Australia
Published with approval of Bureau of Rural Sciences

Yield

The 2010 canola harvest was significantly larger than the 2009 harvest. New South Wales and South Australia both experienced considerable increases in production with a smaller increase in Victoria, but Western Australian production was down. For the first time since 2006 Western Australia did not produce more than half of the national canola crop, instead falling to one third. In 2010 there was 1,650,000 hectares planted, this was 260,000 hectares more than 2009. Despite a lower yield, there was an increase from the 1,897,000 tonnes harvested in 2009 to the 2,115,000 tonnes harvested in 2010. This is second only to the 2,364,000 tonnes harvested in 1999. The national yield of 1.33 t/ha was 0.03 t/ha lower than the 2009 average and the lowest since 2006.

The yield varied from a state average of 0.83 t/ha in Western Australia to 1.97 t/ha in New South Wales. New South Wales, South Australia and Victoria all recorded their highest ever yield this year, conversely Western Australia recorded it's lowest.

Table 1: Canola production in Australia by state 2010

State	Production (kilotonnes)	Area Harvested (kilohectares)	Average Yield (tonnes/hectare)
New South Wales	610	310	1.97
Victoria	440	240	1.83
South Australia	360	200	1.80
Western Australia	705	845	0.83
Australia	2115	1595	1.33

Source: AOF Crop Report May 2011

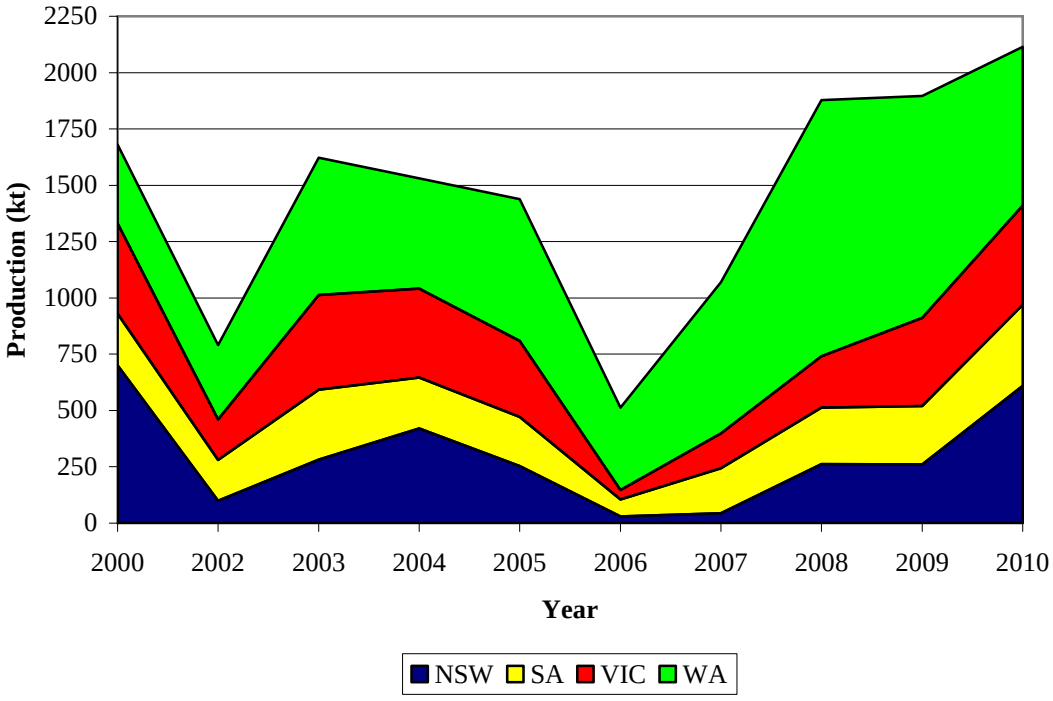

Figure 2: Canola Production in Australia 2000 – 2010

Australian Quality Parameter Summary

The regional, state and Australian mean values for all analysis 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 2010

Quality Parameter	Australian Mean
Oil content, % in whole seed @ 6 % moisture	42.9
Protein content, % in oil-free meal @ 10 % moisture	39.9
Glucosinolates, µmoles/g in whole seed @ 6 % moisture	10
Volumetric grain weights, lbs/b	52.6
kg/hL	65.5
Oleic acid concentration (C18:1), % in oil	61.2
Linoleic acid concentration (C18:2), % in oil	19.4
Linolenic acid concentration (C18:3), % in oil	10.4
Erucic acid concentration (C22:1), % in oil	0.1
Saturated fatty acid concentration, % in oil	7.4
Iodine Value	114.6

Oil Content

The average oil content for the 2010 harvest was 42.9 %. This was an increase of 1.3 % from the 2009 harvest and is well above the previous two years. Oil content ranged from a low of 38.9 % at Geraldton (CAG 1&2 (GM) grade) in Western Australia to a high of 48.2 % at Port Lincoln (CNLT grade) in the Eyre Peninsula of South Australia.

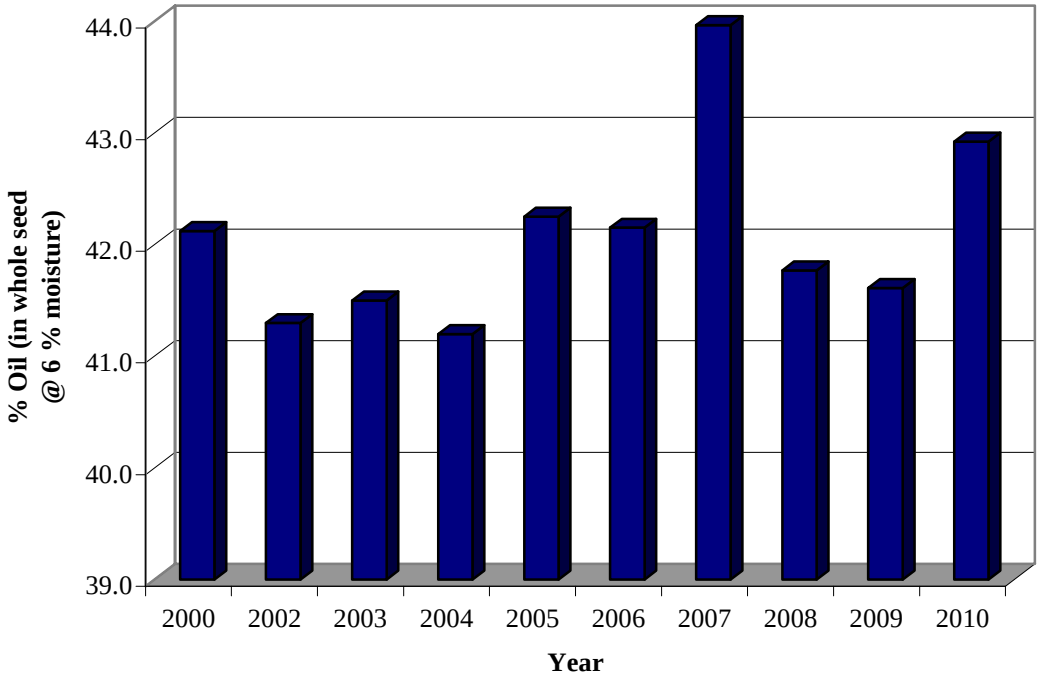

Figure 3: Average Australian oil content 2000 – 2010

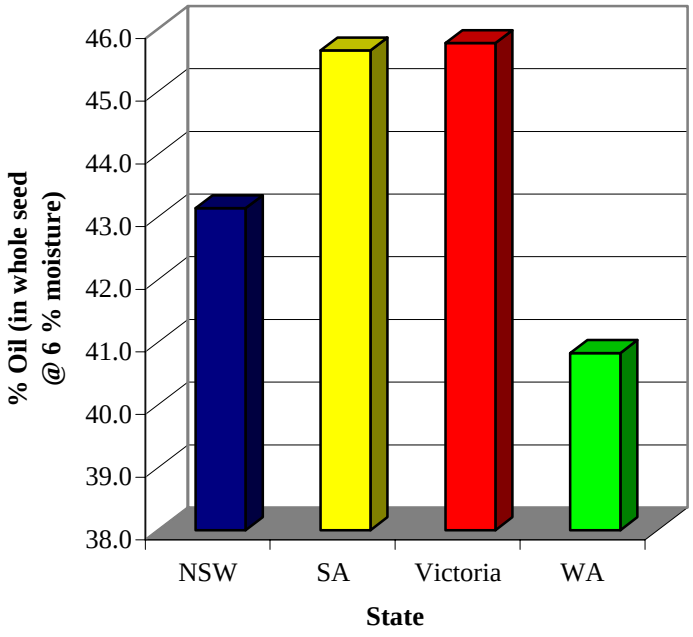

Figure 4: Average oil content by state 2010

Protein Content

The average protein content for the 2010 harvest was 39.9 % in oil free meal. This was a decrease of 0.2 % from the 2009. Protein content ranged from 35.2 % at Yeelanna in the Eyre Peninsula of South Australia to 42.9 % at two of the combined sites in Western Australia – Bokal, Hyden, Katanning, Lake Grace, Newdegate, Nyabing & Wagin (CAN1 & 2 grade) and Brookton, Bulyee, Dale, Narrakine & Wickepin (CAN1 & 2).

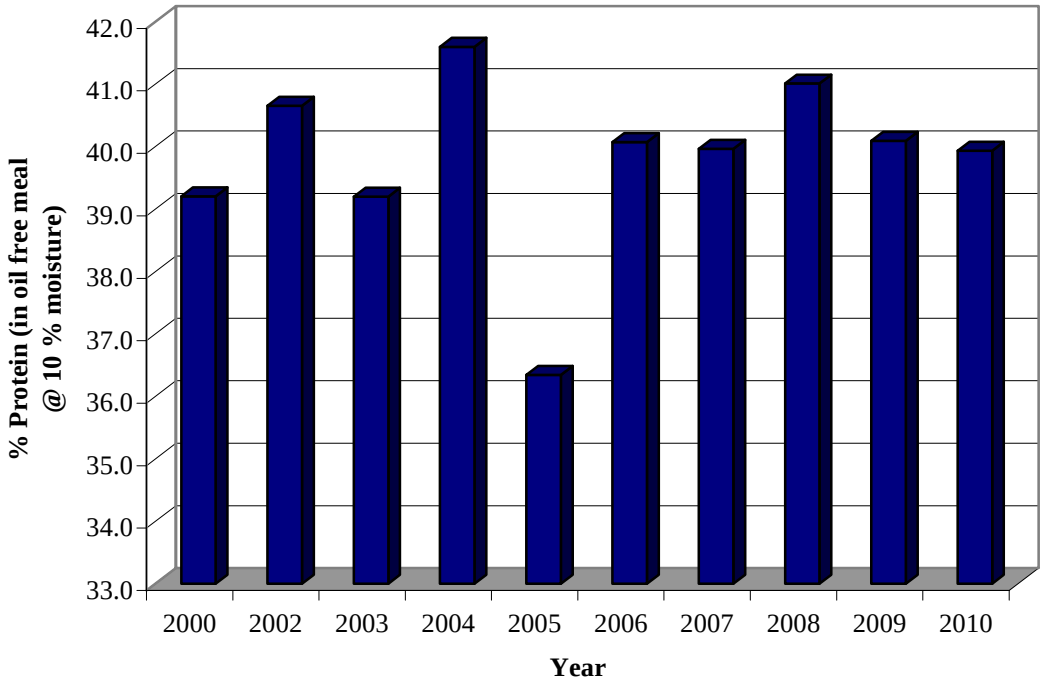

Figure 5: Average Australian protein content 2000 – 2010

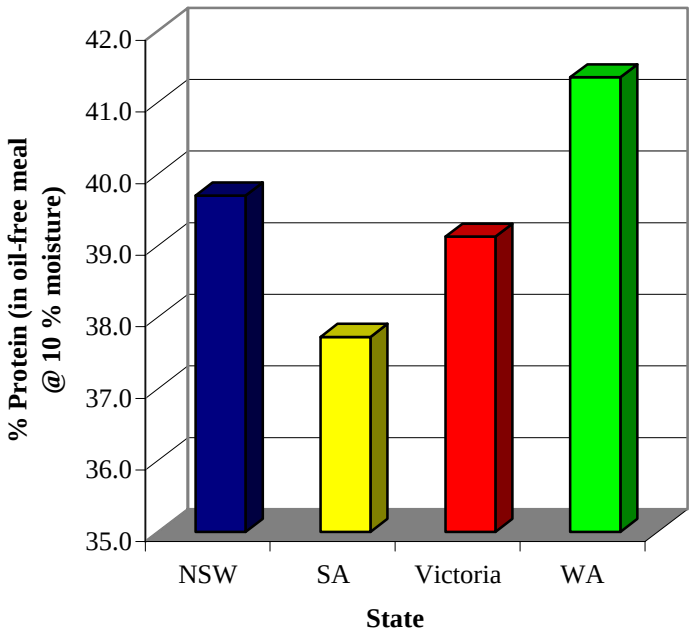

Figure 6: Average protein content by state 2010

Glucosinolate Concentration

The average glucosinolate content for the 2010 harvest was 10 µmoles/g. This was an increase of 1 µmoles/g from the 2009. Glucosinolate content ranged from 6 µmoles/g at Armatree (CAN grade) and Cowra (CAN grade) in Central NSW to 15 µmoles/g at the combined Western Australia site – Bokal, Hyden, Katanning, Lake Grace, Newdegate, Nyabing & Wagin (CAN1 & 2 grade).

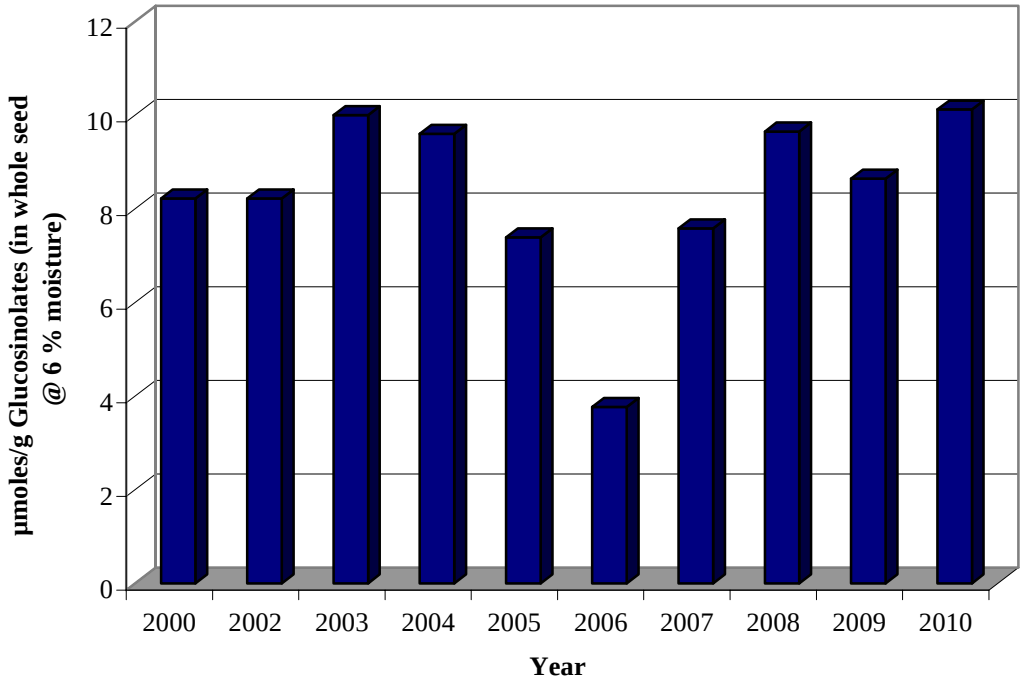

Figure 7: Average Australian glucosinolate content 2000 – 2010

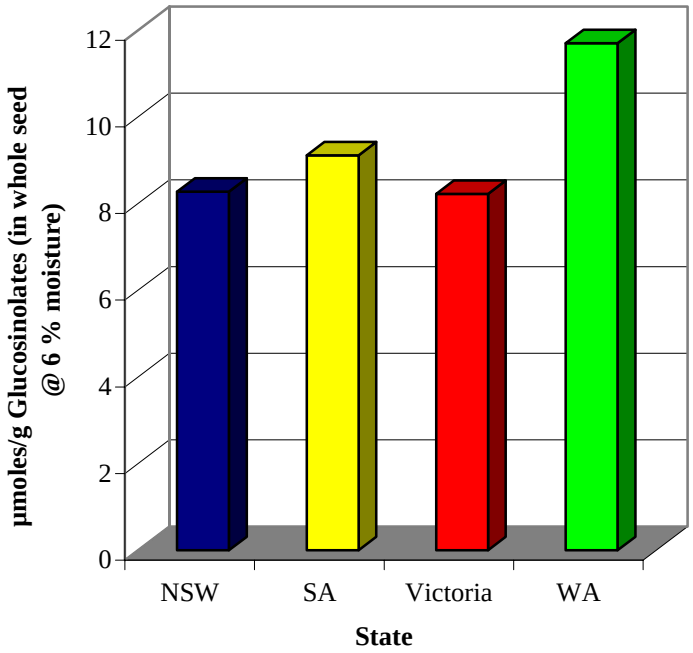

Figure 8: Average glucosinolate content by state 2010

Fatty Acid Composition

Oleic Acid

The average oleic acid (C18:1) concentration in the oil produced from the 2010 harvest was 61.2 %. This was 0.4 % lower than 2009. The oleic concentration ranged from 58.6 % at Grenfell (CANG (GM) grade) in Central NSW to 66.4 % at Harden (CNTW grade) in Southern NSW.

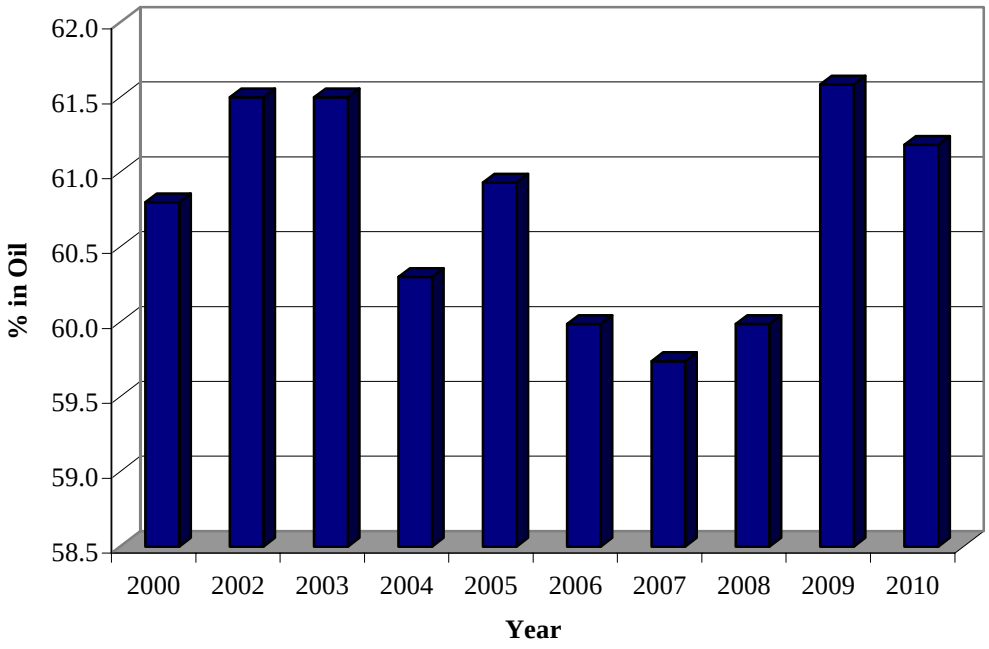

Figure 9: Average Australian oleic acid concentration in canola oil 2000 – 2010

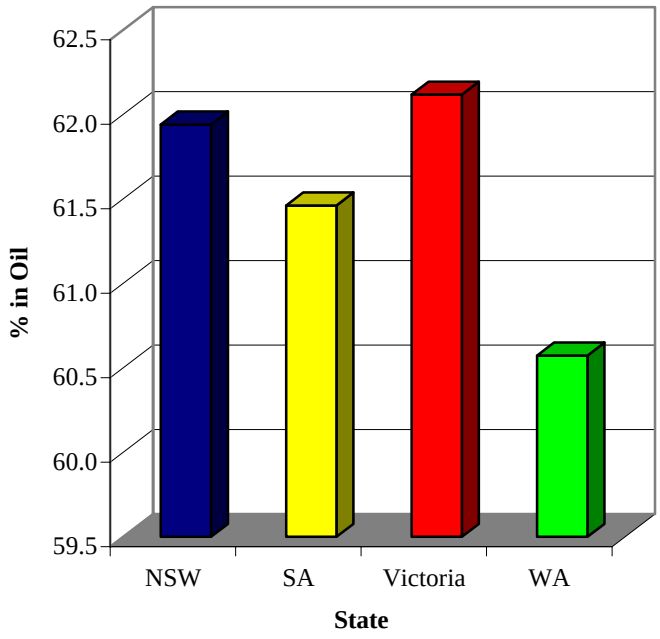

Figure 10: Average oleic acid concentration by state 2010

Linoleic Acid

The average linoleic acid (C18:2) concentration in oil produced from the 2010 harvest was 19.4 %. This was 0.1 % higher than 2009. The concentration ranged from 15.1 % at Harden (CNTW grade) in Southern NSW to 21.2 % at Grenfell (CANG (GM) grade) in Central NSW and Lockhart (CANG (GM) grade) in Southern NSW.

Linolenic Acid

There was an increase of 0.5 % in the linolenic acid (C18:3) concentration to 10.4 %. Linolenic acid concentrations ranged from 8.2 % at Geraldton (CAG 1&2 (GM) grade) in Western Australia to 11.7 % at Keith (CANO grade) in South East South Australia.

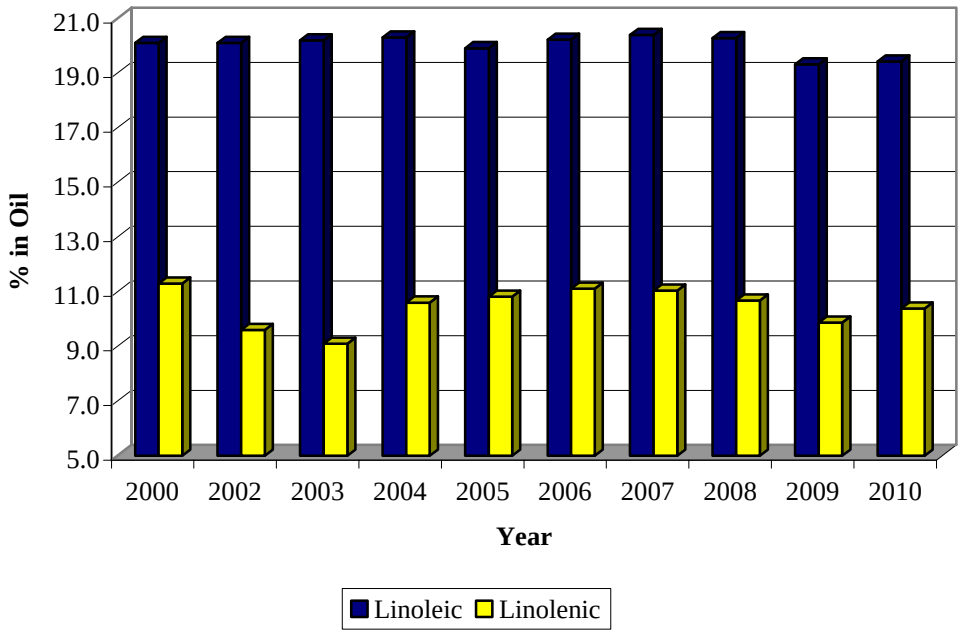

Figure 11: Average Australian linoleic acid and linolenic concentration in canola oil 2000 – 2010

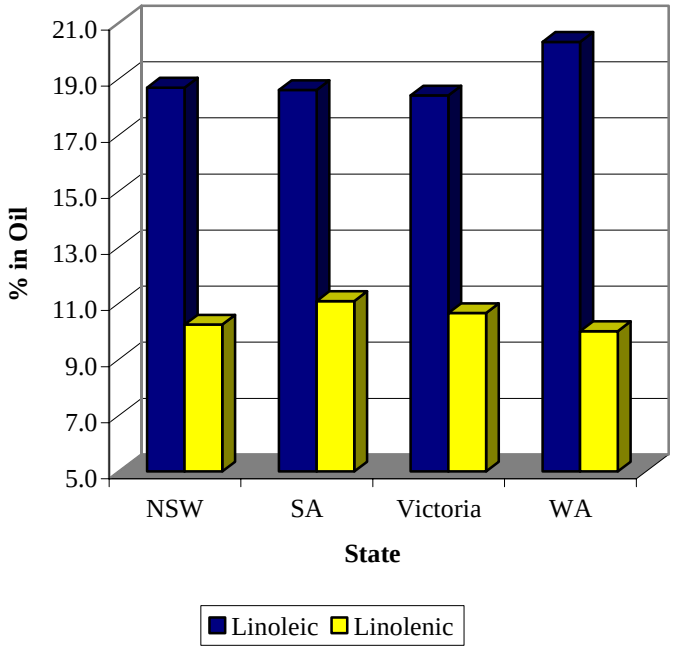

Figure 12: Average linoleic acid and linolenic acid concentration by state 2010

Saturated Fatty Acid

The average saturated fatty acid concentration was 7.4 %. This was a 0.5 % decrease from the 2009 harvest and the lowest since 2006 and the first decrease in three years. Saturated fatty acid concentration ranged from 6.8 % at Junee (CNTW grade) to 8.3 % at Mungeribar (CANG (GM) grade) in Central NSW.

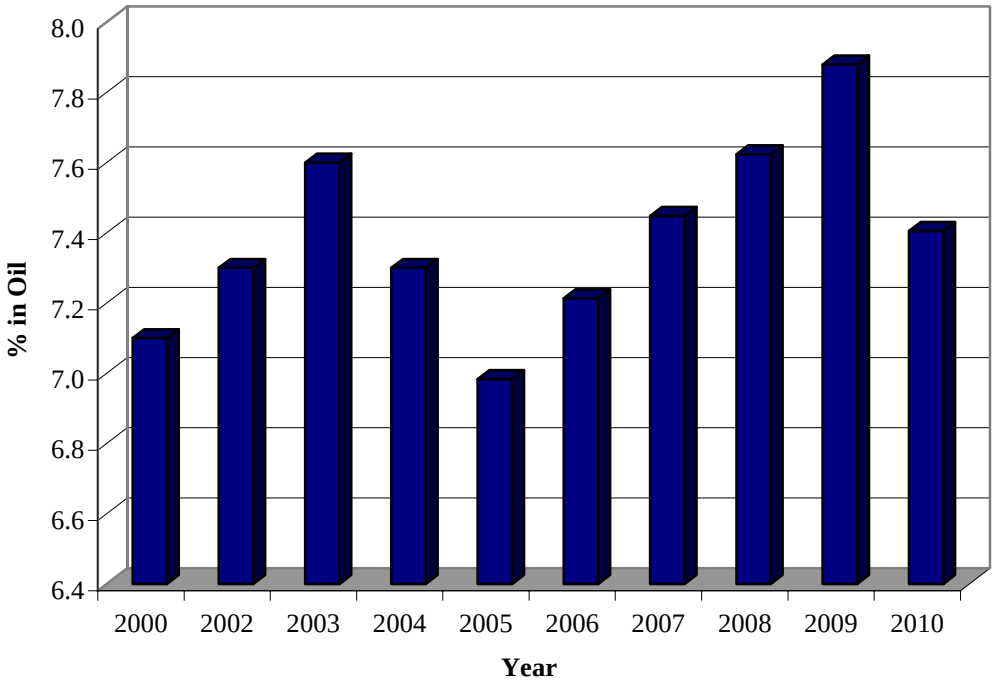

Figure 13: Average Australian saturated fatty acid concentration in canola oil 2000 – 2010

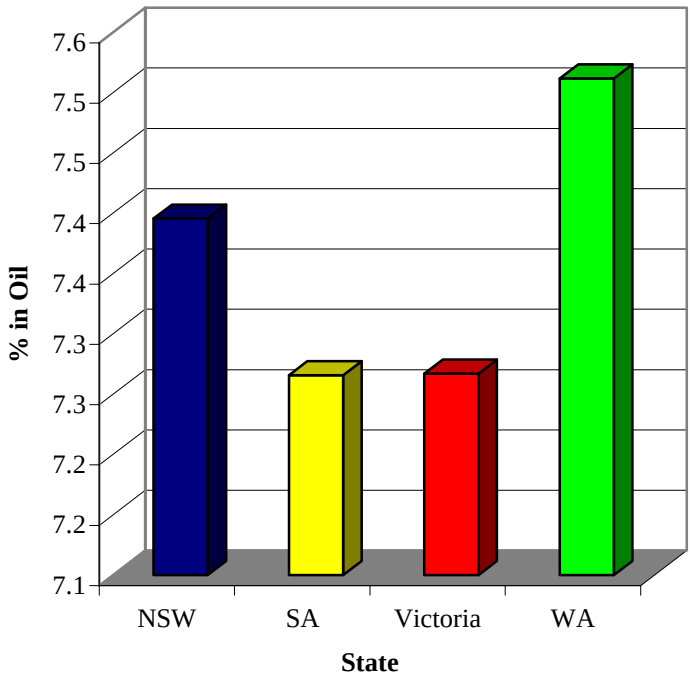

Figure 14: Average saturated fatty acid concentration by state 2010

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	41.8	41.5	8	54.6	68.0
Werris Creek						
Neilrex	CAN	45.8	39.2	8	52.1	65.0
Premer	CAN	44.9	39.3	8	52.6	65.5
Quirindi	CAN	43.7	41.0	9	53.0	66.0
Quirindi	CAN3	43.7	38.8	9	47.7	59.5
Ulamambri	CAN	44.1	40.3	8	53.0	66.0
Northern Mean		**43.6**	**40.6**	**8**	**52.9**	**66.0**
Central NSW						
Dubbo						
Armatree	CAN	43.4	39.7	6	53.4	66.5
Coonamble	CAN	40.1	40.6	7	53.8	67.0
Gilgandra	CAN	42.8	40.1	9	52.6	65.5
Manildra	CAN	45.6	37.1	8	51.7	64.5
Mungeribar	CAN	42.7	40.9	7	52.6	65.5
Mungeribar	CANG	42.3	37.5	9	52.1	65.0
Narwonah	CAN	43.4	39.3	8	51.7	64.5
Nyngan	CAN	42.7	40.4	8	53.0	66.0
Wongarbon	CAN	43.9	38.3	9	51.7	64.5
Yeoval	CAN	44.8	38.5	7	50.8	63.3
Parkes						
Bogan Gate	CAN	43.5	37.8	10	52.1	65.0
Bribbaree	CAN	43.0	39.0	9	53.0	66.0
Caragabal	CAN	42.9	39.1	9	52.6	65.5
Condobolin	CAN	42.5	40.7	9	51.7	64.5
Cowra	CAN	44.7	39.1	6	51.3	64.0
Greenethorpe	CAN	45.0	37.4	8	50.5	63.0
Grenfell	CANG	39.8	37.9	13	52.1	65.0
Milvale	CAN	44.5	37.7	8	50.9	63.5
Parkes Sub	CAN	44.7	38.2	8	51.7	64.5
Parkes Sub	CANG	40.5	37.6	11	51.7	64.5
Red Bend	CAN	40.9	40.5	9	52.1	65.0
Central Mean		**42.8**	**39.5**	**8**	**52.3**	**65.2**
Southern NSW						
Griffith						
Barellan	CAN	43.8	40.1	10	51.1	63.8
Moombooldool	CANG	41.1	38.3	12	51.5	64.3
Wagga Wagga						
Boorowa	CAN	44.8	40.6	8	49.7	62.0
Boorowa	CNTW	45.5	39.0	8	47.3	59.0
Boree Creek	CAN	43.6	39.3	10	52.6	65.5
Coolamon	CAN	44.9	39.7	10	52.6	65.5
Cootamundra	CAN	46.1	39.7	9	49.3	61.5
Cootamundra	CNTW	44.8	39.4	8	48.9	61.0
Harden	CAN	45.5	39.8	7	49.3	61.5
Harden	CNTW	45.6	37.5	9	47.3	59.0

[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 3 (Continued): 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
Wagga Wagga Continued						
Henty West	CAN	45.7	40.3	8	49.3	61.4
Henty West	CNTW	46.0	39.6	9	48.5	60.5
Junee	CAN	44.7	39.7	9	51.7	64.5
Junee	CAN3	45.2	40.2	8	47.1	58.8
Junee	CNTW	45.6	39.1	9	45.7	57.0
Lockhart	CANG	42.2	38.4	10	51.7	64.5
Matong	CAN	44.2	40.5	9	50.0	62.3
Milbrulong	CNTW	44.7	39.8	10	48.1	60.0
The Rock	CAG3	45.9	39.4	9	47.7	59.5
The Rock	CANG	44.0	38.8	10	51.2	63.9
West Wyalong						
Ardlethan	CAN	43.5	39.8	8	52.6	65.5
Maimuru	CAN3	45.9	38.8	7	50.3	62.8
Stockinbingal	CAG3	45.3	39.3	8	46.9	58.5
Stockinbingal	CANG	44.2	38.3	9	49.9	62.3
Temora	CAN	44.2	38.5	9	51.7	64.5
Wyalong	CAN	43.4	40.8	9	52.1	65.0
Southern Mean		**44.4**	**39.5**	**9**	**50.2**	**62.6**
NSW Mean		**43.1**	**39.7**	**8**	**52.1**	**65.0**

[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 4: Quality Data – South Australia

Region/ Zone/ Receival Site	Grade	[1] Oil	[2] Protein	[3] Glucosinolates µmoles/g	[4] Grain Weight lbs/b	kg/hL
Port Adelaide						
Adelaide Area						
Port Adelaide	CANO	45.6	37.3	9	51.7	64.5
Murray Mallee						
Parilla	CANO	46.5	36.8	8	52.1	65.0
Northern Area						
Andrews	CANO	46.5	36.9	10	52.6	65.5
Bowmans	CANO	44.7	37.8	9	51.7	64.5
Caltowie	CANO	45.4	39.0	8	50.9	63.5
Kapunda	CANO	44.9	37.8	7	50.1	62.5
Kapunda	CNLT	45.1	37.0	7	48.1	60.0
Roseworthy	CANO	45.7	37.9	8	51.3	64.0
Tarlee	CNLT	45.5	37.8	8	48.1	60.0
South East						
Frances	CANO	44.6	39.3	9	51.3	64.0
Keith	CANO	43.7	39.5	8	52.1	65.0
Millicent	CANO	47.0	37.2	7	51.7	64.5
Tailem Bend	CANO	45.7	37.3	10	51.7	64.5
Wolseley	CANO	43.6	40.3	9	50.5	63.0
Wolseley	CNLT	44.1	39.9	9	48.9	61.0
Port Adelaide Mean		**45.3**	**38.0**	**9**	**51.5**	**64.2**
Port Giles						
Yorke Peninsula						
Ardrossan	CANO	46.0	37.4	9	50.5	63.0
Ardrossan	CNLT	46.2	35.9	9	47.3	59.0
Port Giles Mean		**46.1**	**37.3**	**9**	**50.2**	**62.6**
Port Lincoln						
Eyre Peninsula						
Cummins	CANO	46.1	37.4	10	51.3	64.0
Cummins	CNLT	46.8	37.5	10	48.1	60.0
Port Lincoln	CANO	46.1	37.4	9	50.9	63.5
Port Lincoln	CNLT	48.2	35.6	7	46.9	58.5
Rudall	CANO	46.1	35.8	9	53.0	66.0
Ungarra	CANO	47.3	37.9	7	51.3	64.0
Yeelanna	CANO	47.1	38.3	9	51.3	64.0
Yeelanna	CNLT	47.5	35.2	9	46.5	58.0
Port Lincoln Mean		**46.4**	**37.2**	**9**	**51.0**	**63.5**
SA Mean		**45.7**	**37.7**	**9**	**51.3**	**63.9**

[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						
Goroke	CAN	45.5	39.7	9	50.5	63.0
Horsham	CANG	45.9	37.9	9	50.5	63.0
Murtoa Sub	CAN	46.4	40.3	8	50.9	63.5
Naracoorte	CAN	45.6	39.5	8	50.9	63.5
Natimuk	CAN	45.2	39.6	9	50.5	63.0
Warracknabeal	CAN	44.7	39.7	9	51.3	64.0
Ouyen						
Ouyen	CAN	46.1	38.4	7	53.0	66.0
Rainbow	CAN	45.9	37.7	7	53.0	66.0
Swan Hill						
Piangil	CAN	46.7	37.3	7	53.0	66.0
Quambatook	CAN	47.1	37.7	7	51.7	64.5
Swan Hill	CAN	45.1	39.3	7	51.7	64.5
North West Mean		**45.9**	**39.2**	**8**	**51.4**	**64.1**
South East Vic						
Marong East						
Elmore	CAN	45.2	38.5	8	49.7	62.0
Oaklands	CAN	43.9	40.0	10	50.5	63.0
St James	CANG	47.0	37.8	9	50.5	63.0
Tocumwal	CAN	43.5	40.8	10	50.5	63.0
Marong South						
Dunolly Sub	CAN	46.7	38.5	8	50.5	63.0
South East Mean		**45.5**	**38.9**	**9**	**50.3**	**62.7**
Victoria Mean		**45.8**	**39.1**	**8**	**51.1**	**63.7**

[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

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						
Albany Borden Cranbrook Gairdner Kojaneerup Tambellup Wellstead	CAN1 & 2	41.5	42.4	9	53.4	66.5
Bokal Hyden Katanning Lake Grace Newdegate Nyabing Wagin	CAN1 & 2	39.3	42.9	15	53.0	66.0
Cranbrook Wellstead	CAG1 & 2	40.6	40.0	13	53.4	66.5
Esperance						
Beaumont Cascades Lake Varley Mount Madden Munglinup Ravensthorpe West River	CAN1 & 2	42.2	39.1	10	53.8	67.0
Esperance	CAG1 & 2	41.8	39.0	12	54.6	68.0
Esperance	CAN1 & 2	43.0	42.7	9	53.8	67.0
Geraldton						
Carnamah Mingenew	CAN1	40.2	41.5	13	54.6	68.0
Geraldton	CAG1 & 2	38.9	40.1	14	54.6	68.0
Geraldton Northampton Yuna	CAN1 & 2	39.5	41.5	13	54.6	68.0

[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 6 (Continued): 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
Kwinana						
Avon Carrabin Hines Hill Kellerberrin MGC Narembeen Quairading York	CAN1 & 2	39.9	42.5	13	53.8	67.0
Brookton Bulyee Dale Narrakine Wickepin	CAN1 & 2	41.1	42.9	12	52.6	65.5
Calingiri Koorda Kwinana McLevie Miling Moora Nembudding Piawaning Wongan Hills	CAN1 & 2	39.2	42.1	10	53.8	67.0
Carrabin Wongan Hills York	CAG1 & 2	39.3	42.0	13	53.8	67.0
W.A. Mean		**40.8**	**41.3**	**12**	**53.7**	**66.9**

[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	4.5	0.3	2.0	62.1	19.1	9.8	0.5	1.0	0.2	< 0.1	0.2	0.1	100	7.5	113.3
Werris Creek																	
Neilrex	CAN	0.1	4.3	0.3	1.9	61.7	18.9	10.6	0.5	1.1	0.2	0.2	0.1	0.1	100	7.1	114.7
Premer	CAN	0.1	4.4	0.3	2.0	61.2	19.7	9.9	0.6	1.1	0.3	0.1	0.2	0.2	100	7.5	113.9
Quirindi	CAN	0.1	4.4	0.3	2.1	61.5	19.5	10.0	0.6	1.1	0.3	< 0.1	0.1	0.2	100	7.6	113.8
Quirindi	CAN3	0.1	4.2	0.3	2.0	62.0	19.1	9.7	0.6	1.1	0.3	< 0.1	0.2	0.2	100	7.5	113.2
Ulamambri	CAN	0.1	4.3	0.3	1.8	60.9	20.0	9.7	0.5	1.4	0.3	0.5	0.1	0.2	100	7.1	114.0
Northern Mean		**0.1**	**4.4**	**0.3**	**2.0**	**61.6**	**19.4**	**9.9**	**0.6**	**1.1**	**0.3**	**0.1**	**0.1**	**0.2**	**100**	**7.5**	**113.7**
Central NSW																	
Dubbo																	
Armatree	CAN	0.1	4.2	0.3	2.1	62.6	18.2	10.4	0.5	1.0	0.2	< 0.1	0.1	0.2	100	7.3	113.8
Coonamble	CAN	0.1	4.3	0.3	2.2	61.3	19.4	10.0	0.6	1.1	0.2	0.1	0.1	0.1	100	7.5	113.9
Gilgandra	CAN	0.1	4.2	0.3	2.2	63.0	18.1	9.9	0.6	1.0	0.3	< 0.1	0.1	0.1	100	7.4	112.7
Manildra	CAN	0.1	4.0	0.3	1.9	64.2	16.5	10.5	0.6	1.2	0.3	0.1	0.1	0.2	100	7.0	112.7
Mungeribar	CAN	0.1	4.3	0.3	2.1	61.7	18.9	10.4	0.6	1.1	0.2	< 0.1	0.2	0.2	100	7.5	114.0
Mungeribar	CANG	0.1	4.5	0.4	2.4	62.1	18.3	9.6	0.7	1.1	0.3	< 0.1	0.3	0.2	100	8.3	111.6
Narwonah	CAN	0.1	4.4	0.3	2.0	61.9	18.6	10.4	0.6	1.2	0.3	< 0.1	0.2	0.1	100	7.5	113.9
Nyngan	CAN	0.1	4.3	0.3	2.1	62.4	18.4	10.0	0.6	1.1	0.3	< 0.1	0.2	0.1	100	7.6	113.0
Wongarbon	CAN	0.1	4.0	0.3	2.0	65.0	16.1	10.1	0.6	1.2	0.3	< 0.1	0.1	0.2	100	7.1	111.5
Yeoval	CAN	0.1	4.2	0.3	2.0	62.5	17.6	10.8	0.6	1.1	0.3	< 0.1	0.2	0.2	100	7.4	113.8
Parkes																	
Bogan Gate	CAN	0.1	4.1	0.3	1.9	65.3	15.8	9.8	0.7	1.3	0.3	< 0.1	0.2	0.2	100	7.2	110.6
Bribbaree	CAN	0.1	4.2	0.3	1.9	61.7	18.4	10.5	0.6	1.3	0.3	0.3	0.2	0.2	100	7.2	114.0
Caragabal	CAN	0.1	4.1	0.3	1.9	63.5	17.0	10.4	0.6	1.3	0.3	0.2	0.2	0.2	100	7.1	112.6
Condobolin	CAN	0.1	4.2	0.3	2.0	61.9	18.4	10.6	0.6	1.2	0.3	< 0.1	0.2	0.1	100	7.4	114.1
Cowra	CAN	0.1	4.1	0.3	1.9	61.0	19.1	10.7	0.6	1.3	0.2	0.3	0.1	0.2	100	7.1	115.1
Greenethorpe	CAN	0.1	4.1	0.3	2.0	61.7	18.7	10.4	0.6	1.3	0.3	0.3	0.1	0.2	100	7.2	114.0
Grenfell	CANG	0.1	4.6	0.4	2.0	58.6	21.2	10.6	0.6	1.1	0.3	0.1	0.2	0.2	100	7.8	116.2
Milvale	CAN	0.1	4.1	0.3	1.9	61.7	18.6	10.6	0.6	1.3	0.3	0.3	0.1	0.2	100	7.1	114.5
Parkes Sub	CAN	0.1	4.2	0.3	2.0	62.6	18.2	10.2	0.6	1.2	0.3	< 0.1	0.2	0.2	100	7.3	113.4
Parkes Sub	CANG	0.1	4.6	0.4	2.1	60.5	19.9	10.0	0.7	1.1	0.3	< 0.1	0.2	0.2	100	8.0	113.8
Red Bend	CAN	0.1	4.2	0.3	2.0	61.5	18.7	10.4	0.6	1.3	0.3	0.2	0.2	0.2	100	7.4	114.1
Central Mean		**0.1**	**4.2**	**0.3**	**2.0**	**62.2**	**18.4**	**10.3**	**0.6**	**1.2**	**0.3**	**0.1**	**0.2**	**0.2**	**100**	**7.4**	**113.6**
Southern NSW																	
Griffith																	
Barellan	CAN	0.1	4.2	0.3	2.0	62.0	18.6	10.3	0.6	1.2	0.3	0.1	0.1	0.2	100	7.3	113.8
Moombooldool	CANG	< 0.1	4.7	0.4	2.0	59.7	20.8	10.0	0.7	1.1	0.3	< 0.1	0.2	0.2	100	7.9	114.7
Wagga Wagga																	
Boorowa	CAN	0.1	4.2	0.3	2.0	61.2	19.8	9.9	0.5	1.2	0.2	0.3	0.1	0.1	100	7.2	114.2
Boorowa	CNTW	0.1	4.1	0.3	2.0	62.5	18.3	10.0	0.6	1.2	0.3	0.3	0.1	0.2	100	7.2	113.2
Boree Creek	CAN	0.1	4.3	0.4	1.9	61.3	18.8	10.9	0.6	1.1	0.3	< 0.1	0.1	0.2	100	7.3	115.0
Coolamon	CAN	0.1	4.4	0.3	2.1	60.7	19.5	10.7	0.6	1.1	0.3	< 0.1	0.1	0.2	100	7.5	115.2
Cootamundra	CAN	0.1	4.3	0.3	2.0	62.6	18.1	9.8	0.6	1.3	0.3	0.3	0.2	0.2	100	7.5	112.4
Cootamundra	CNTW	0.1	4.2	0.3	2.0	62.1	19.4	9.4	0.6	1.2	0.3	0.3	0.1	0.1	100	7.2	112.9
Harden	CAN	0.1	4.3	0.3	2.1	60.6	19.9	10.2	0.5	1.2	0.2	0.4	0.1	0.2	100	7.3	114.6
Harden	CNTW	0.1	3.9	0.3	1.9	66.4	15.1	9.7	0.6	1.3	0.3	0.1	0.1	0.2	100	6.9	110.1

[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 7 (Continued): 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
Wagga Wagga Continued																	
Henty West	CAN	0.1	4.2	0.3	2.0	61.3	19.6	9.9	0.6	1.2	0.3	0.3	0.1	0.2	100	7.2	114.1
Henty West	CNTW	0.1	4.2	0.3	2.0	61.1	19.7	9.9	0.6	1.3	0.3	0.4	0.1	0.1	100	7.2	114.2
Junee	CAN	0.1	4.2	0.3	1.9	60.5	20.1	10.0	0.6	1.5	0.3	0.5	0.1	0.2	100	7.1	114.6
Junee	CAN3	0.1	4.2	0.3	1.9	60.2	20.4	9.8	0.6	1.5	0.2	0.5	0.1	0.2	100	7.1	114.6
Junee	CNTW	0.1	4.1	0.3	1.7	61.3	19.1	9.8	0.5	1.7	0.3	0.8	0.1	0.2	100	6.8	113.6
Lockhart	CANG	0.1	4.7	0.4	2.0	58.7	21.2	10.8	0.6	1.0	0.3	< 0.1	0.2	0.2	100	7.8	116.4
Matong	CAN	0.1	4.2	0.3	1.9	62.2	18.2	10.8	0.6	1.1	0.3	< 0.1	0.1	0.2	100	7.2	114.5
Milbrulong	CNTW	0.1	4.3	0.3	1.8	60.7	19.8	10.1	0.6	1.3	0.3	0.3	0.1	0.2	100	7.2	114.6
The Rock	CAG3	0.1	4.6	0.3	2.0	60.7	19.9	10.3	0.6	1.0	0.3	< 0.1	0.1	0.2	100	7.6	114.7
The Rock	CANG	0.1	4.5	0.3	2.2	61.4	19.1	10.2	0.6	1.0	0.3	< 0.1	0.2	0.2	100	7.8	113.8
Wyalong																	
Ardlethan	CAN	0.1	4.2	0.3	2.2	61.7	19.1	10.2	0.6	1.1	0.2	< 0.1	0.1	0.1	100	7.4	114.0
Maimuru	CAN3	0.1	4.1	0.3	1.9	62.5	18.1	10.2	0.6	1.4	0.3	0.4	0.1	0.2	100	7.0	113.5
Stockinbingal	CAG3	0.1	4.5	0.3	2.1	61.3	19.8	9.6	0.6	1.0	0.3	< 0.1	0.2	0.2	100	7.7	113.3
Stockinbingal	CANG	0.1	4.6	0.3	2.0	60.5	20.5	9.7	0.6	1.0	0.3	< 0.1	0.2	0.2	100	7.7	114.1
Temora	CAN	0.1	4.4	0.3	1.9	60.5	19.6	10.7	0.6	1.2	0.3	0.1	0.1	0.2	100	7.4	115.3
Wyalong	CAN	0.1	4.3	0.3	1.9	61.2	19.0	10.9	0.5	1.1	0.3	0.1	0.1	0.2	100	7.2	115.4
Southern Mean		**0.1**	**4.3**	**0.3**	**2.0**	**61.2**	**19.4**	**10.2**	**0.6**	**1.2**	**0.3**	**0.2**	**0.1**	**0.2**	**100**	**7.4**	**114.2**
N.S.W. Mean		**0.1**	**4.3**	**0.3**	**2.0**	**61.9**	**18.7**	**10.2**	**0.6**	**1.2**	**0.3**	**0.1**	**0.2**	**0.2**	**100**	**7.4**	**113.7**

[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																	
Adelaide Area																	
Pt Adelaide	CANO	0.1	4.3	0.3	1.9	61.8	18.5	10.9	0.5	1.0	0.2	0.1	0.1	0.1	100	7.2	115.0
Murray Mallee																	
Parilla	CANO	0.1	4.5	0.4	2.0	60.6	19.0	11.5	0.5	1.0	0.2	0.2	0.1	0.1	100	7.3	116.3
Northern Area																	
Andrews	CANO	0.1	4.2	0.3	1.9	63.8	17.2	10.3	0.5	1.1	0.3	0.1	0.1	0.2	100	7.0	112.9
Bowmans	CANO	0.1	4.3	0.3	1.9	61.5	19.0	10.8	0.5	1.0	0.3	< 0.1	0.1	0.1	100	7.3	115.1
Caltowie	CANO	0.1	4.4	0.3	1.9	60.2	20.4	10.5	0.5	1.0	0.2	0.1	0.1	0.1	100	7.3	115.7
Kapunda	CANO	0.1	4.3	0.3	2.0	61.9	18.7	10.5	0.6	1.1	0.2	0.1	0.1	0.1	100	7.3	114.4
Kapunda	CNLT	0.1	4.3	0.3	2.0	62.2	18.7	10.4	0.5	1.0	0.2	0.1	0.1	0.1	100	7.2	114.1
Roseworthy	CANO	0.1	4.3	0.3	1.9	61.7	18.6	10.7	0.6	1.2	0.2	0.2	0.1	0.1	100	7.2	114.6
Tarlee	CNLT	0.1	4.2	0.3	1.8	62.2	18.4	10.5	0.5	1.1	0.3	0.1	0.1	0.2	100	7.0	114.3
South East																	
Frances	CANO	0.1	4.3	0.3	1.9	62.5	18.2	10.6	0.5	1.1	0.3	< 0.1	0.1	0.1	100	7.2	114.1
Keith	CANO	0.1	4.4	0.3	2.0	59.5	20.0	11.7	0.6	1.0	0.2	< 0.1	0.1	0.1	100	7.3	117.5
Millicent	CANO	0.1	4.3	0.3	2.1	59.6	20.0	11.3	0.7	1.1	0.3	< 0.1	0.2	0.2	100	7.6	116.6
Tailem Bend	CANO	0.1	4.4	0.3	1.9	60.2	19.5	11.5	0.5	1.0	0.2	0.1	0.1	0.1	100	7.2	116.8
Wolseley	CANO	0.1	4.3	0.3	2.0	61.9	18.6	10.7	0.5	1.1	0.3	< 0.1	0.1	0.1	100	7.3	114.6
Wolseley	CNLT	0.1	4.3	0.3	2.0	62.1	18.1	10.9	0.6	1.0	0.3	0.1	0.1	0.1	100	7.3	114.5
Port Adelaide Mean		**0.1**	**4.3**	**0.3**	**1.9**	**61.2**	**19.0**	**11.0**	**0.5**	**1.0**	**0.2**	**0.1**	**0.1**	**0.1**	**100**	**7.2**	**115.5**
Port Giles																	
Yorke Peninsula																	
Ardrossan	CANO	0.1	4.3	0.3	1.9	61.3	18.3	11.6	0.6	1.1	0.3	< 0.1	0.1	0.1	100	7.2	115.9
Ardrossan	CNLT	0.1	4.2	0.3	1.9	63.9	16.4	10.8	0.6	1.1	0.3	< 0.1	0.1	0.2	100	7.2	113.0
Port Giles Mean		**0.1**	**4.3**	**0.3**	**1.9**	**61.6**	**18.1**	**11.5**	**0.6**	**1.1**	**0.3**	**< 0.1**	**0.1**	**0.1**	**100**	**7.2**	**115.6**
Port Lincoln																	
Eyre Peninsula																	
Cummins	CANO	0.1	4.3	0.3	2.0	62.2	17.8	11.1	0.6	1.2	0.3	< 0.1	0.1	0.1	100	7.3	114.5
Cummins	CNLT	0.1	4.2	0.3	2.0	63.7	16.8	10.8	0.6	1.1	0.3	< 0.1	0.1	0.1	100	7.2	113.2
Pt Lincoln	CANO	0.1	4.3	0.3	2.0	61.9	17.8	11.3	0.6	1.2	0.3	0.1	0.1	0.1	100	7.4	114.7
Pt Lincoln	CNLT	0.1	4.4	0.3	2.0	61.6	18.2	11.2	0.6	1.1	0.2	0.1	0.1	0.1	100	7.4	115.0
Rudall	CANO	0.1	4.3	0.3	2.0	61.1	19.6	10.7	0.5	0.9	0.2	0.1	0.1	0.1	100	7.2	115.6
Ungarra	CANO	0.1	4.4	0.3	2.0	60.5	19.2	11.5	0.5	1.0	0.2	0.1	0.1	0.2	100	7.2	116.5
Yeelanna	CANO	0.1	4.3	0.3	1.9	61.7	18.1	11.4	0.6	1.1	0.3	0.1	0.1	0.1	100	7.2	115.4
Yeelanna	CNLT	0.1	4.4	0.3	2.1	61.6	18.0	11.4	0.6	1.1	0.3	< 0.1	0.1	0.1	100	7.5	115.0
Port Lincoln Mean		**0.1**	**4.3**	**0.3**	**2.0**	**61.9**	**18.0**	**11.2**	**0.6**	**1.1**	**0.3**	**< 0.1**	**0.1**	**0.1**	**100**	**7.3**	**114.8**
S.A. Mean		**0.1**	**4.3**	**0.3**	**2.0**	**61.5**	**18.6**	**11.1**	**0.6**	**1.1**	**0.2**	**0.1**	**0.1**	**0.1**	**100**	**7.3**	**115.2**

[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																	
Goroke	CAN	< 0.1	4.3	0.3	2.0	62.5	18.4	10.5	0.5	1.0	0.3	< 0.1	< 0.1	0.1	100	7.1	114.2
Horsham	CANG	0.1	4.3	0.3	2.1	60.9	18.8	11.4	0.6	1.0	0.3	< 0.1	0.1	0.2	100	7.5	115.7
Murtoa Sub	CAN	0.1	4.3	0.3	2.0	62.9	18.0	10.3	0.5	1.1	0.3	< 0.1	0.1	0.1	100	7.3	113.2
Naracoorte	CAN	0.1	4.4	0.3	2.0	61.1	18.8	10.9	0.6	1.2	0.3	< 0.1	0.1	0.2	100	7.5	114.9
Natimuk	CAN	0.1	4.2	0.3	2.0	63.5	17.5	10.1	0.6	1.2	0.3	0.1	0.1	0.1	100	7.3	112.4
Warracknabeal	CAN	0.1	4.3	0.3	2.0	62.9	17.7	10.7	0.6	1.1	0.2	< 0.1	0.1	0.1	100	7.3	113.8
Ouyen																	
Ouyen	CAN	0.1	4.2	0.3	2.1	62.1	18.0	11.1	0.5	0.9	0.2	0.3	0.1	0.1	100	7.2	114.8
Rainbow	CAN	0.1	4.2	0.3	2.0	61.6	18.6	11.3	0.5	0.9	0.2	< 0.1	0.1	0.1	100	7.1	115.9
Swan Hill																	
Piangil	CAN	0.1	4.4	0.3	2.0	61.7	18.4	11.2	0.5	0.9	0.2	0.1	0.1	0.1	100	7.2	115.4
Quambatook	CAN	0.1	4.4	0.3	2.0	61.4	18.9	11.2	0.4	0.9	0.2	< 0.1	0.1	0.1	100	7.1	115.9
Swan Hill	CAN	0.1	4.3	0.3	2.1	61.1	19.0	11.1	0.5	0.9	0.2	0.1	0.1	0.1	100	7.2	115.7
North West Mean		**0.1**	**4.3**	**0.3**	**2.0**	**62.3**	**18.2**	**10.7**	**0.5**	**1.0**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**7.3**	**114.3**
South East Vic																	
Marong East																	
Elmore	CAN	0.1	4.1	0.3	1.9	63.2	17.6	10.5	0.6	1.2	0.3	< 0.1	0.1	0.1	100	7.1	113.5
Oaklands	CAN	0.1	4.4	0.3	1.9	60.8	19.6	10.5	0.6	1.1	0.3	0.1	0.1	0.2	100	7.4	114.9
St James	CANG	0.1	4.4	0.3	2.0	61.9	19.3	10.0	0.5	1.0	0.2	< 0.1	0.2	0.2	100	7.4	113.8
Tocumwal	CAN	0.1	4.3	0.3	1.8	61.3	19.1	10.5	0.7	1.3	0.3	0.1	0.1	0.2	100	7.3	114.5
Marong South																	
Dunolly Sub	CAN	0.1	4.4	0.3	1.9	60.7	19.4	10.9	0.6	1.2	0.3	0.1	0.1	0.1	100	7.3	115.6
South East Mean		**0.1**	**4.3**	**0.3**	**1.9**	**61.7**	**18.9**	**10.5**	**0.6**	**1.2**	**0.3**	**< 0.1**	**0.1**	**0.2**	**100**	**7.3**	**114.4**
Victoria Mean		**0.1**	**4.3**	**0.3**	**2.0**	**62.1**	**18.4**	**10.7**	**0.6**	**1.1**	**0.2**	**< 0.1**	**0.1**	**0.1**	**100**	**7.3**	**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: 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																	
Albany Borden Cranbrook Gairdner Kojaneerup Tambellup Wellstead	CAN1 & 2	0.1	4.4	0.3	2.0	59.8	20.4	10.9	0.5	1.0	0.2	< 0.1	0.1	0.1	100	7.4	116.4
Bokal Hyden Katanning Lake Grace Newdegate Nyabing Wagin	CAN1 & 2	0.1	4.5	0.3	1.9	59.2	20.8	10.5	0.6	1.3	0.3	0.2	0.1	0.2	100	7.5	115.9
Cranbrook Wellstead	CAG1 & 2	0.1	4.6	0.4	2.0	59.9	20.9	10.0	0.6	1.0	0.3	< 0.1	0.2	0.2	100	7.7	115.0
Esperance																	
Beaumont Cascades Lake Varley Mount Madden Munglinup Ravensthorpe West River	CAN1 & 2	0.1	4.5	0.4	1.8	61.7	19.3	9.9	0.6	1.1	0.3	< 0.1	0.1	0.2	100	7.4	113.6
Esperance	CAG1 & 2	0.1	4.7	0.4	2.0	60.1	20.3	10.2	0.6	1.0	0.3	< 0.1	0.2	0.1	100	7.9	114.7
Esperance	CAN1 & 2	0.1	4.5	0.3	2.0	60.1	20.3	10.7	0.5	1.0	0.2	0.1	0.1	0.1	100	7.4	116.0
Geraldton																	
Carnamah Mingenew	CAN1	0.1	4.5	0.3	1.9	62.4	19.9	8.6	0.6	1.1	0.3	< 0.1	0.2	0.1	100	7.5	111.9
Geraldton	CAG1 & 2	0.1	4.5	0.4	1.9	61.5	21.1	8.2	0.6	1.0	0.3	< 0.1	0.2	0.1	100	7.6	112.1
Geraldton Northampton Yuna	CAN1 & 2	0.1	4.5	0.3	1.9	62.0	20.2	8.6	0.6	1.1	0.3	0.1	0.2	0.1	100	7.5	112.1

[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 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
Kwinana																	
Avon Carrabin Hines Hill Kellerberrin MGC Narembeen Quairading York	CAN1 & 2	0.1	4.5	0.3	1.9	60.6	20.6	9.8	0.6	1.1	0.3	< 0.1	0.1	0.1	100	7.5	114.6
Brookton Bulyee Dale Narrakine Wickepin	CAN1 & 2	0.1	4.3	0.3	1.9	61.1	19.9	10.1	0.6	1.2	0.3	< 0.1	0.1	0.1	100	7.3	114.7
Calingiri Koorda Kwinana McLevie Miling Moora Nembudding Piawaning Wongan Hills	CAN1 & 2	0.1	4.6	0.3	1.9	60.3	20.7	9.8	0.5	1.1	0.3	0.2	0.1	0.1	100	7.4	114.6
Carrabin Wongan Hills York	CAG1 & 2	< 0.1	4.5	0.4	2.0	61.8	20.0	9.3	0.6	1.0	0.3	< 0.1	0.2	0.0	100	7.5	113.3
W.A. Mean		**0.1**	**4.5**	**0.3**	**1.9**	**60.6**	**20.3**	**10.0**	**0.6**	**1.1**	**0.3**	**< 0.1**	**0.1**	**0.1**	**100**	**7.5**	**114.7**

[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)			
	NSW	SA	Vic	WA	NSW	SA	Vic	WA	NSW	SA	Vic	WA
ATR Cobbler	43.1	45.9	45.3	42.2	40.1	36.7	38.9	38.8	12	11	10	13
AV Garnet	43.9	48.3	48.0	*	38.9	34.2	35.5	*	11	10	14	*
CB Agamax	42.6	46.6	46.2	*	39.6	34.6	35.3	*	7	8	6	*
CB Argyle	44.4	46.8	46.3	44.1	42.7	38.6	41.0	40.3	5	3	6	4
CB Eclipse RR	42.1	*	*	42.7	38.9	*	*	37.0	9	*	*	6
CB Jardee HT	43.0	44.6	44.4	41.5	39.8	36.6	37.8	39.3	8	8	7	9
CB Junee HT	*	47.6	*	*	*	33.3	*	*	*	5	*	*
CB Mallee HT	41.9	44.3	43.7	41.4	40.1	36.2	38.3	38.4	10	8	10	9
CB Scaddan	42.8	43.9	44.0	41.3	40.0	36.5	38.2	38.5	9	7	7	8
CB Tanami	41.7	44.2	42.8	40.4	40.3	36.4	38.4	39.1	13	10	12	13
CB Telfer	44.0	46.9	45.9	43.4	42.0	37.8	39.7	40.0	6	5	4	4
CB Tumby HT	42.6	45.0	45.0	42.7	40.8	37.1	38.0	38.4	9	9	7	9
CBWA-097	*	*	*	39.5	*	*	*	36.6	*	*	*	9
CHYB-1035	*	*	*	37.4	*	*	*	41.3	*	*	*	7
CHYB-127	43.0	46.1	44.4	43.1	39.5	35.7	38.5	38.5	9	5	8	4
CrusherTT	42.7	45.8	45.2	44.4	39.3	36.4	37.8	38.4	13	10	17	11
Fighter TT (T2181)	43.0	45.0	44.7	41.2	42.9	39.3	40.3	41.0	17	17	17	21
GT Cougar	43.5	*	*	40.4	38.0	*	*	36.6	11	*	*	14
GT Mustang	45.0	*	*	40.9	40.3	*	*	38.7	10	*	*	15
GT Scorpion	41.1	*	*	39.8	39.3	*	*	37.2	10	*	*	14
GT61	43.2	*	*	43.3	40.5	*	*	37.4	7	*	*	8
Hyola 404RR	45.9	*	*	44.9	40.6	*	*	38.5	8	*	*	7
Hyola 433	44.5	47.6	47.3	41.0	39.5	36.0	36.7	43.6	9	10	11	8
Hyola 444TT (T98002)	43.8	45.6	45.8	*	41.6	40.5	41.5	*	9	9	7	*
Hyola 50	43.6	48.2	47.8	*	40.2	35.3	36.1	*	8	9	8	*
Hyola 502RR	*	*	*	41.6	*	*	*	39.3	*	*	*	8
Hyola 505RR	44.4	*	*	44.9	41.9	*	*	39.9	8	*	*	6
Hyola 555TT (T2522)	44.2	46.1	45.6	45.6	40.2	38.0	39.6	39.5	10	10	8	10
Hyola 571CL	43.7	46.0	45.3	42.1	39.9	37.4	38.4	40.1	14	11	14	15
Hyola 575CL	44.5	47.1	46.0	42.9	40.3	37.4	39.0	40.6	7	8	6	10
Hyola 606RR	43.5	*	*	47.1	41.8	*	*	36.8	8	*	*	4
Hyola 676CL	45.5	48.3	47.5	46.7	42.2	38.8	40.0	41.2	5	5	4	6
Hyola 751TT	43.1	45.7	45.2	44.8	39.8	37.1	39.2	39.1	10	8	7	7
Monola 76TT	45.5	47.3	47.6	46.8	41.3	37.8	39.0	39.0	8	7	6	6
Monola 77TT	46.1	47.5	47.9	*	41.5	38.1	39.0	*	5	4	4	*
N04D-2318	43.3	44.8	44.8	43.0	41.5	39.0	39.1	40.7	6	6	6	7
NG298	42.2	*	*	40.7	39.9	*	*	37.7	4	*	*	4
NG304	42.5	*	*	40.7	39.8	*	*	37.5	9	*	*	10
NL110	45.6	47.8	48.0	47.1	41.6	38.3	39.3	39.7	6	5	4	5
NL120	46.3	48.4	48.2	46.4	41.6	37.6	38.9	39.8	6	5	5	5
NT045	45.5	47.6	46.5	45.1	40.7	37.3	39.6	40.7	5	5	4	5
NT049	47.3	48.6	48.8	47.2	39.0	35.6	36.6	38.3	4	5	3	4
Pioneer 07N398I	44.2	46.5	45.7	42.9	40.0	36.8	37.9	39.2	9	8	9	11
Pioneer 07N406I	45.0	47.3	47.0	46.8	39.9	36.8	38.4	36.9	7	7	11	11
Pioneer 08N020R	*	*	*	42.0	*	*	*	38.1	*	*	*	7
Pioneer 08N021R	43.7	*	*	42.4	40.0	*	*	39.3	10	*	*	9
Pioneer 08N102I	42.8	44.7	45.1	42.3	39.5	36.5	36.5	38.6	12	13	12	13
Pioneer 44Y84	44.7	46.6	46.1	44.2	39.7	36.7	38.1	38.4	8	7	9	8
Pioneer 45Y82	43.6	45.6	45.4	42.6	39.5	36.7	37.5	39.0	9	10	8	8
Pioneer 46Y20	45.6	*	*	45.1	41.2	*	*	39.4	8	*	*	7
Pioneer 46Y78	44.3	47.0	46.6	*	41.2	36.9	38.7	*	9	7	9	*
Pioneer 46Y83	44.4	47.2	46.3	45.7	39.5	35.9	38.4	38.3	7	7	8	8
RT123	44.7	*	*	*	40.7	*	*	*	8	*	*	*
SMPTHC101	*	*	44.9	*	*	*	36.5	*	*	*	4	*
SMPTHC102	*	47.6	46.7	*	*	34.7	37.1	*	*	8	8	*
SMPTHC103	*	46.2	44.9	*	*	35.6	37.4	*	*	9	8	*
SMPTHC104	*	46.3	46.3	*	*	37.4	39.6	*	*	10	9	*
SMPTHC105	*	45.3	44.9	*	*	37.1	41.4	*	*	10	10	*

* Variety not grown in state.

Table 11 (Continued): 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)			
	NSW	SA	Vic	WA	NSW	SA	Vic	WA	NSW	SA	Vic	WA
T2214	45.0	46.2	*	*	41.2	38.2	*	*	8	6	*	*
Tarcoola	*	48.3	*	*	*	36.9	*	*	*	8	*	*
Tawriffic TT	45.6	48.0	47.5	44.6	40.7	36.9	38.8	40.2	6	5	4	7
Thumper TT (T2214)	*	47.3	46.6	45.2	*	37.5	39.6	40.9	*	8	7	7
Victory V3001	42.8	45.6	45.1	*	37.7	35.0	35.8	*	13	11	15	*
Juncea Canola												
Oasis CL	46.5	47.0	*	*	44.3	41.2	*	*	5	3	*	*
Sahara CL	41.2	43.7	*	*	43.8	41.9	*	*	9	9	*	*
SARDI515M	46.3	47.7	*	*	43.1	38.4	*	*	11	9	*	*

* Variety not grown in state.

Please note Victorian averages are not for the entire state. They are calculated on a selection of sites only.

Definitions

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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