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Quality of Australian Canola 2013

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Introduction

Sample Analysis

Canola samples representing the 2013 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

It was another solid year nationally for canola in 2013. Encouraged by the strong results for canola in 2012/13 the area sown in 2013/14 was only slightly lower than the previous season when a record area was sown. Relative price differences between canola and wheat were not as large at sowing in 2013 as they were in 2012. The narrower price gap between wheat and canola, the need to get rotations back to a more sustainable system and dry conditions at the optimum planting time all contributed to decision making. Production was still the second highest on record at an estimated 3.90 million tonnes, about 330,000 tonnes lower than the record set in 2012/13.

New South Wales

Unlike the 2012 season, 2013 started very dry with most areas receiving very little summer and early autumn rainfall to build subsoil moisture profiles. Summer fallow moisture management through strict weed control was the key to some growers being able to sow some canola early with the majority of growers sowing the crop dry in the lead-up to a more consistent autumn break in mid-May. Establishment on crops dry-sown close to the main autumn break was very good. Little canola was sown west of the Newell Highway in the north of the state as that area missed out on summer rains and were drought affected for the rest of the season.

Sowings were also down in western areas of the centre of the state as the break came too late in those areas. The main production areas remained in the south. Average to well above average rainfall was received in June across most of the central and southern areas, as well as the north-east. Rainfall was below average in July and again in August, except in the south, between Wagga Wagga and Albury. A single rainfall event in mid-September maintained good yield potential. However subsequent dry conditions continually reduced yield potential through to harvest. A major frost event in northern NSW occurred around 20-21 August which impacted all crops, including canola. Up to 80% loss was recorded on some crops. A significant frost or series of frosts from 15-18 October affected crops across a wide area of central and southern NSW, primarily east of the Newell Highway. Losses of 30-70% were common in the worst affected low lying areas along creeks and valleys.

Crops responded to mild temperatures through most of winter and were comparatively early in development by August. Sclerotinia was detected in crops at this early time of the season where the moist and mild conditions favoured its development. Many crops were sprayed for the disease in Sclerotinia-prone areas. Blackleg, whilst not affecting crop yield potential developed at low levels on pods in spring across a wide area of central and southern NSW. The extremely dry spring brought harvest forward, being one of the earliest on record.

Frost damaged grain caused a few issues at some delivery sites but overall most of the poorer quality grain was not retained in the harvest operation. A small number of crops were not harvested and were fed off as stockfeed.

Final estimated production for NSW was 900,000 tonnes from an estimated 600,000 hectares, for an average yield of 1.50 t/ha.

Victoria

Victoria started the season with a dry soil profile in all of the canola growing areas. For this reason the record Mallee area sown in 2012 was down by 33%, the other areas were relatively unchanged.

The seasonal break was erratic. Only the north east region was sown during the optimal period in late April/ early May. Other regions were later than optimal with many dry-sown Mallee crops emerging poorly and some were subsequently abandoned. Significant rain finally fell at the end of May. Average to above average rainfall was recorded through all of winter. Parts of the west Wimmera and south-west Victoria experienced minor to severe waterlogging. North-east and west Mallee rainfall was lower in September. October rainfall was only about 50% of the average in much of northern Victoria, the exception being the Wimmera which was close to normal and south-west Victoria which had an exceptional October.

Wet conditions at petal fall led to a large incidence and moderate severity of Sclerotinia in plant branches in north-east Victoria. Many crops were sprayed with excellent returns on investment, but results were less economical on some crops.

Maximum temperatures were slightly warmer through all of winter which offset the late planting date with crops growing well. September was exceptionally warm, with temperatures 2-5⁰C above average in the Mallee. This hastened maturity and stopped flowering for short periods in September and October. A severe frost affected north-central and north-east Victoria on 18 October which reduced yield potential by an estimated 25% on average. The harsh finish to the season also took its toll on yields. Oil content was generally excellent but some frost affected crops were very low.

Harvest commenced early and finished ahead of normal due to a dry windrowing and harvest period without stoppages. Yields were excellent in the Wimmera and the south-west and generally below expectations in other areas, but were consistent with the rainfall received.

Final estimated production for Victoria was 700,000 tonnes from an estimated area of 400,000 hectares, for an average yield of 1.75 t/ha.

South Australia

A similar area of canola was sown in South Australia in 2013 as had been grown in 2012. Basically no rain fell in SA over summer or autumn 2012-13. Some sowing commenced in mid-April but most crops were sown in mid to late May after the autumn break.

Due to the dry summer and autumn, blackleg had less effect on crops than in the previous years but white leaf spot incidence was higher than previously observed. Downy mildew also was prevalent. Millipedes and earwigs also caused damage to some crops while slaters were also more of a problem than in previous years. The mild, wet spring meant that the diseases Alternaria and Sclerotinia also had an impact on grain yield and pod infection by blackleg was also observed, particularly on the Eyre Peninsula.

Rainfall was generally average to above average throughout winter with reasonable spring rain also occurring for the first time in three years. There were reports of frost damage in the Mallee. As with all eastern states spring was mild allowing crops to fill and oil contents were generally good considering the dry finish. Overall yields were reasonable.

Final estimated production for South Australia was 500,000 tonnes from an estimated area of 300,000 hectares, for an average yield of 1.67 t/ha.

Western Australia

Growers in Western Australia sowed a record area in 2013. The season started well with crop sowing into good seedbed moisture in May. June was a very dry month and seasonal forecasts were for only average rainfall for the following three months. Good rains fell in late July and through August and September which set the crop up for a good yield potential. However, the eastern and north eastern wheat belt remained drier than other more favoured areas to the west and south. The

Geraldton Port zone and districts east of the Great Northern Highway from Wongan Hills and Dalwallinu, and north and east of Merredin experienced a below average season.

Temperatures through spring were above average but crop finishing conditions were good as adequate soil moisture assisted the crop to yield well with solid oil contents. Dry conditions allowed an uninterrupted harvest of good quality grain.

Sclerotinia developed in many crops where conditions in early spring favoured the disease, mainly along the west coast, but also in higher rainfall areas in the south. Fungicide application was required in many instances.

Final estimated production for Western Australia was a record 1.796 million tonnes from an estimated 1.177 million hectares for an average yield of 1.53 t/ha.

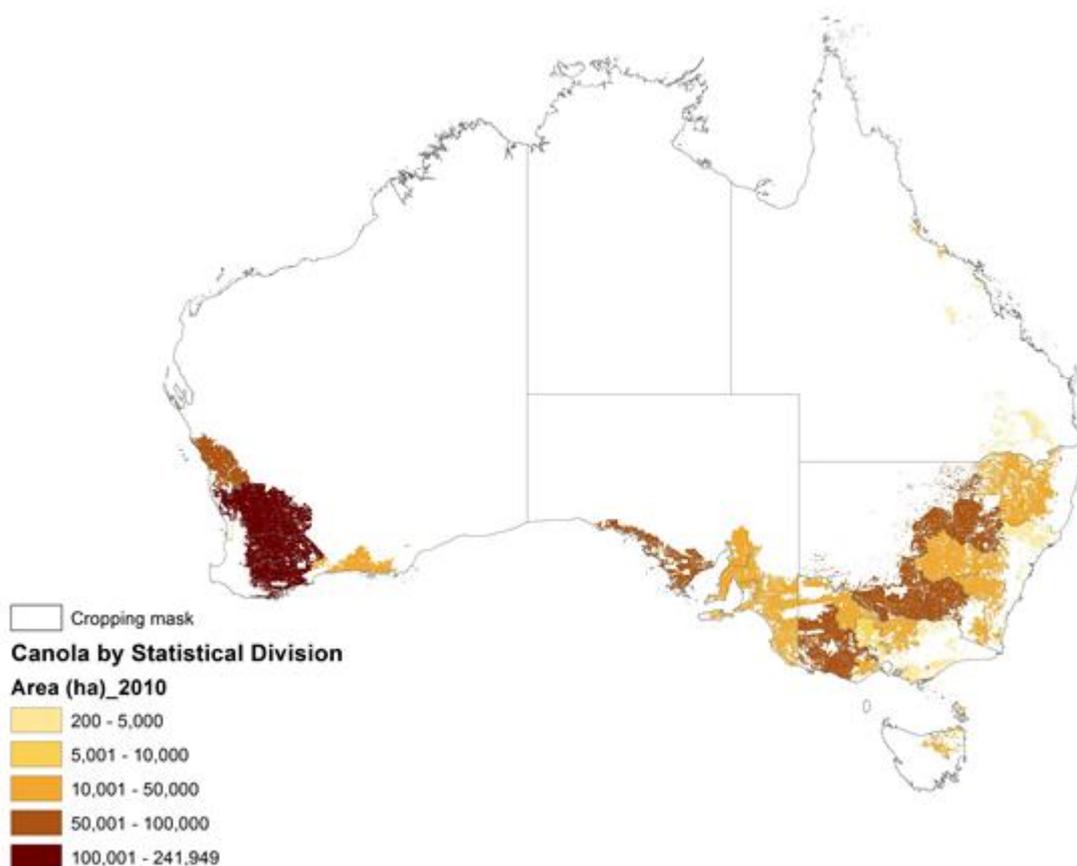


Figure 1: Areas of canola production in Australia
Published with approval of Bureau of Rural Sciences

Yield

The 2013 canola harvest was a record breaker in terms of both area harvested and production, with a massive 2,477,000 hectares harvested, producing a record 3,896,000 tonnes of canola. Both South Australia and Western Australia had set records in terms of production, with Western Australia up an incredible 556,000 tonnes on the last record set in 2011. New South Wales and Victoria also enjoyed the second highest level of production on record.

As area harvested was also a record high, the average yield of 1.57 t/ha was 0.26 t/ha more than the 2012 season but didn't set any records.

Yields ranged from 1.50 t/ha in New South Wales to 1.75 t/ha in Victoria.

Table 1: Canola production in Australia by state 2013

State	Production (kilotonnes)	Area Harvested (kilohectares)	Average Yield (tonnes/hectare)
New South Wales	900	600	1.50
Victoria	700	400	1.75
South Australia	500	300	1.67
Western Australia	1796	1177	1.53
Australia	3896	2477	1.57

Source: AOF

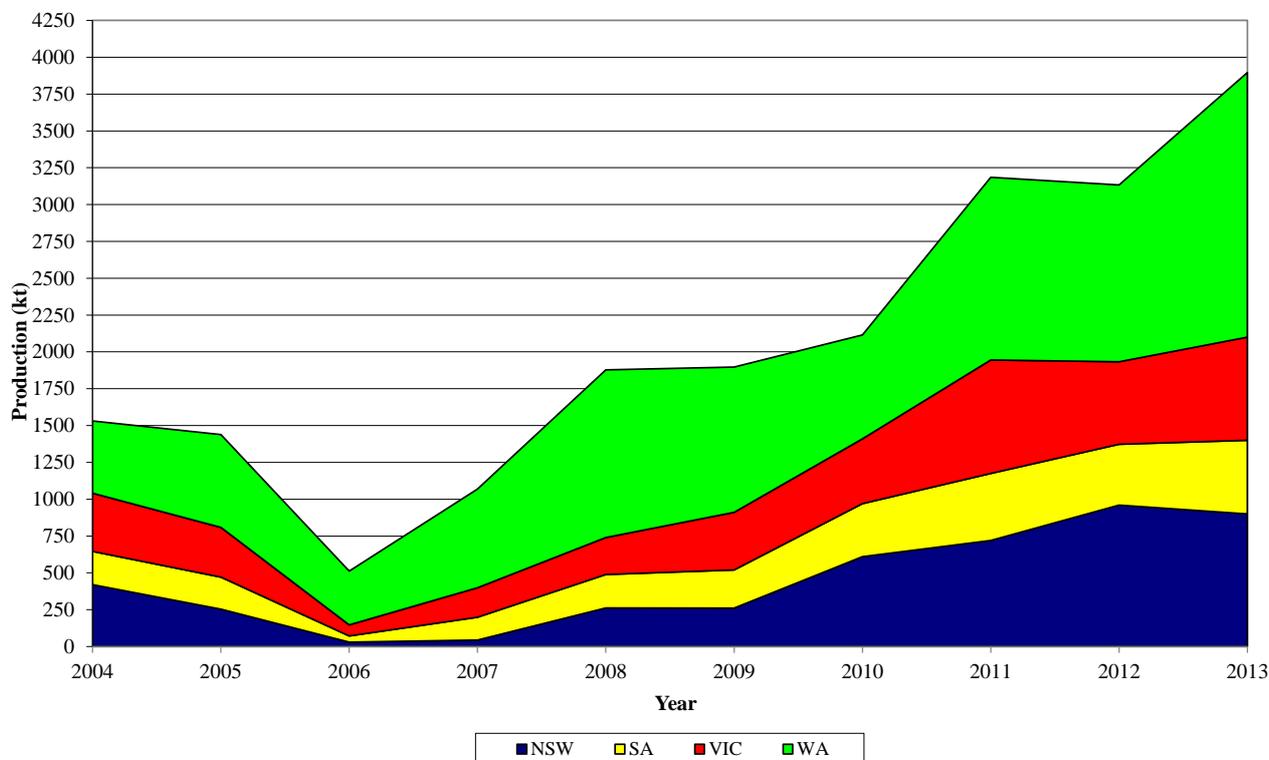


Figure 2: Canola Production in Australia 2004 – 2013

Australian Quality Parameter Summary

The mean regional and state values for all analyses for New South Wales, South Australia and Victoria were calculated on the basis of the tonnages each Site and Grade represents.

In Western Australia tonnages were only available for port zones and not individual sites. As such the mean for each port zone is the arithmetic mean and the mean for the state is the weighted mean.

The Australian mean values were calculated using the total tonnages for each state.

However, due to tonnages being confidential information, no individual site tonnages can be reported.

Table 2: Average quality of Australian canola 2013

Quality Parameter	Australian Mean
Oil content, % in whole seed @ 6 % moisture	45.7
Protein content, % in oil-free meal @ 10 % moisture	37.2
Glucosinolates, μ moles/g in whole seed @ 6 % moisture	6
Volumetric grain weights, lbs/b	53.2
kg/hL	66.8
Oleic acid concentration (C18:1), % in oil	62.4
Linoleic acid concentration (C18:2), % in oil	18.4
Linolenic acid concentration (C18:3), % in oil	10.4
Erucic acid concentration (C22:1), % in oil	< 0.1
Saturated fatty acid concentration, % in oil	7.2
Iodine Value	113.8

Oil Content

The average oil content for the 2013 harvest was 45.7 %. This was the highest on record, with an increase of 2.3 % from the 2012 harvest. Oil content ranged from a low of 40.5 % for the CAN grade for Moree-Haddads in New South Wales to a high of 49.6 % at Katanning in Western Australia.

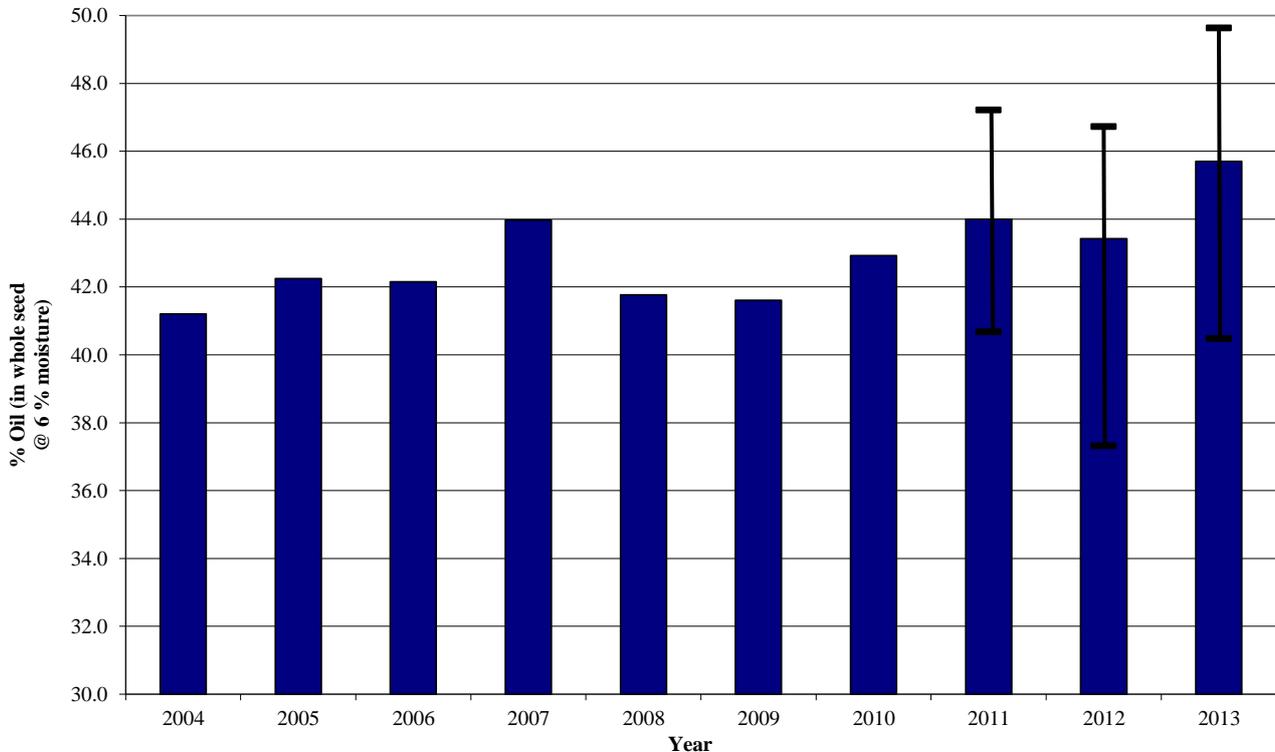


Figure 3: Average Australian oil content 2004 - 2013

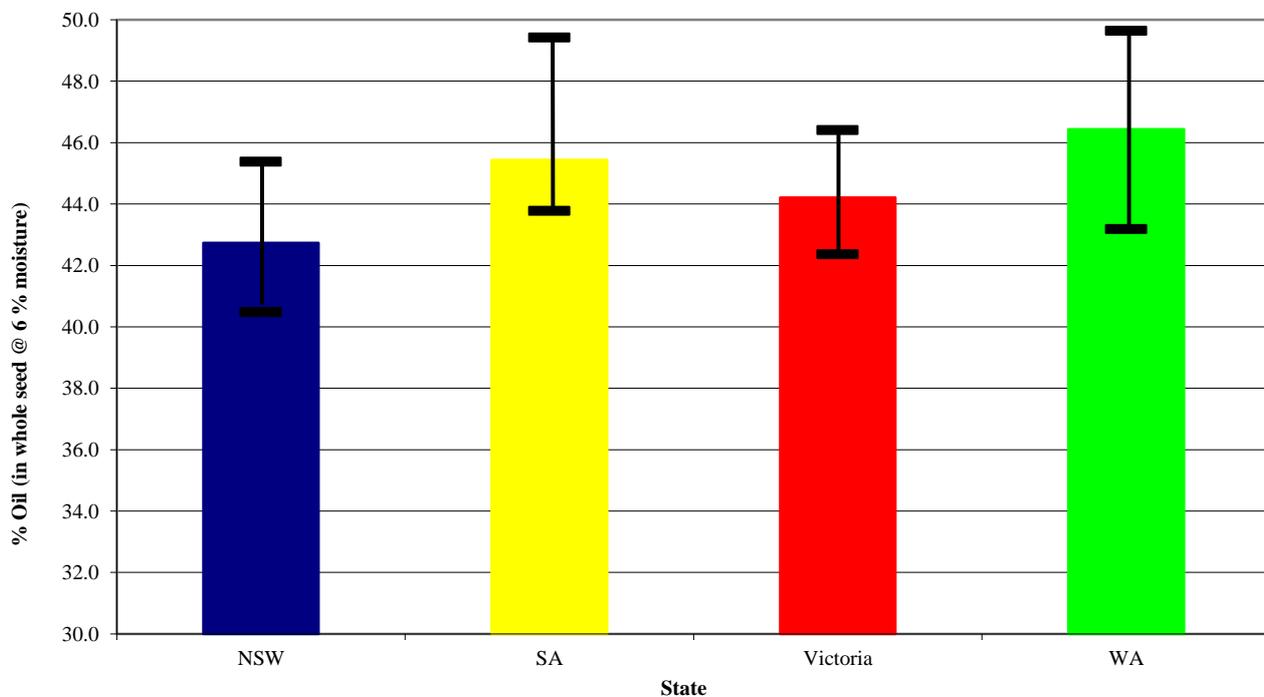


Figure 4: Average oil content by state 2013

Bars show the minimum and maximum for each range

Protein Content

The average protein content for the 2013 harvest was 37.3 % in oil free meal. This was a decrease of 2.0 % from the 2012 harvest. Protein content ranged from 33.3 % at Dumbleyung in Western Australia to 43.7 % at Moree-Haddads in New South Wales.

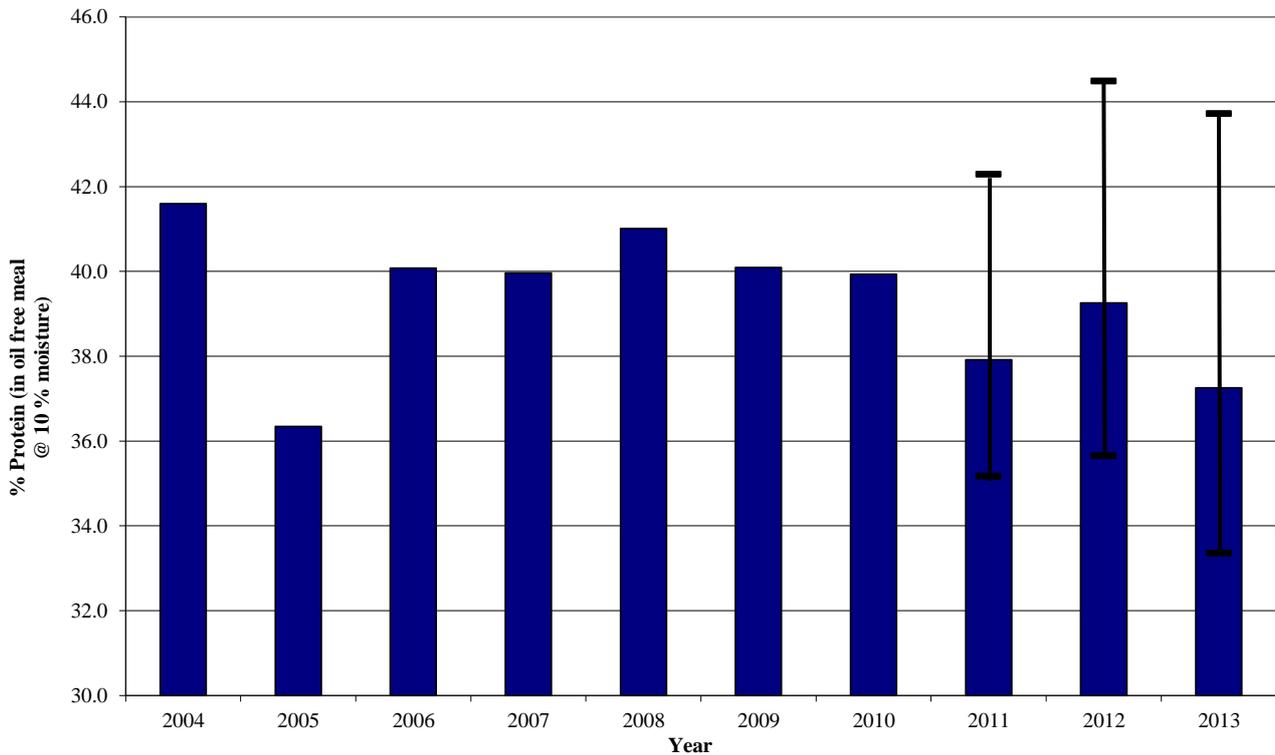


Figure 5: Average Australian protein content 2004 - 2013

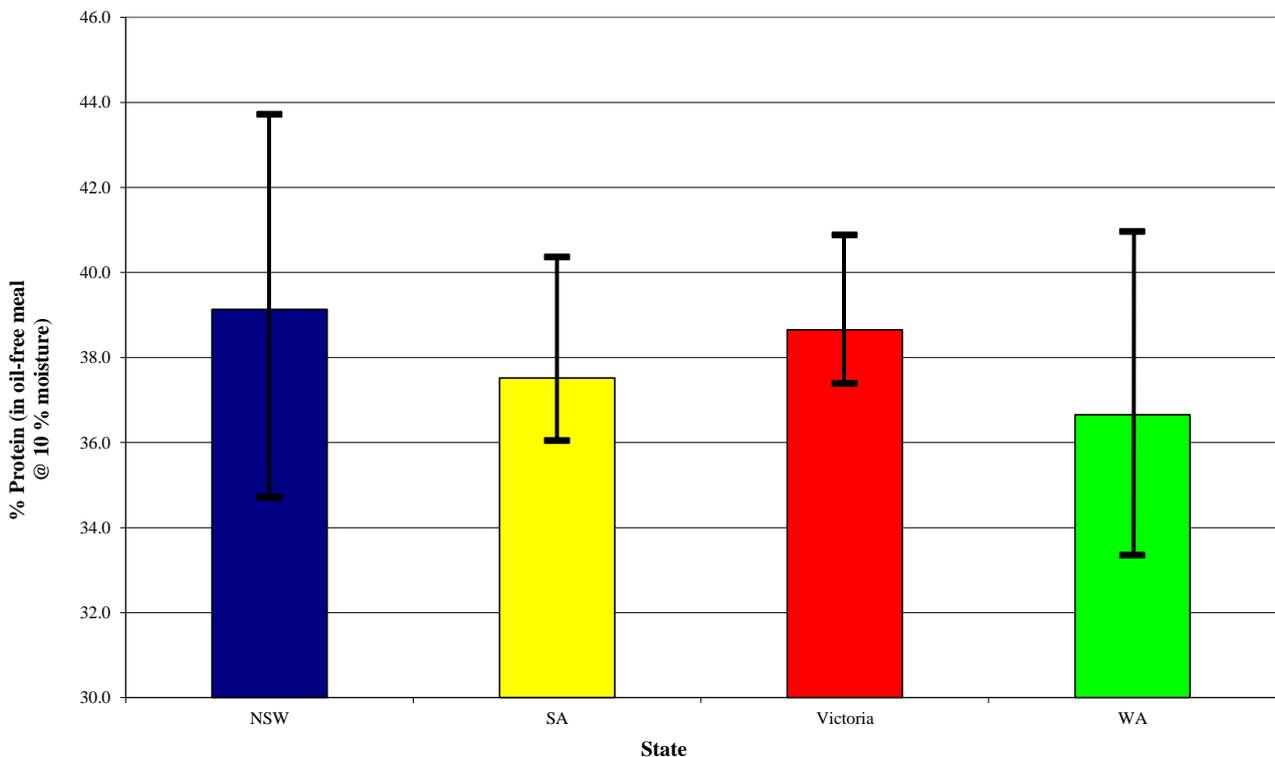


Figure 6: Average protein content by state 2013
Bars show the minimum and maximum for each range

Glucosinolate Concentration

The average glucosinolate content for the 2013 harvest was 6 $\mu\text{moles/g}$, a steady decline since the record in 2010 of 10 $\mu\text{moles/g}$. The average dropped 3% from last year's harvest. Glucosinolate content ranged from 3 $\mu\text{moles/g}$ at multiple sites in Western Australia and South Australia to 13 $\mu\text{moles/g}$ at Trajere in New South Wales.

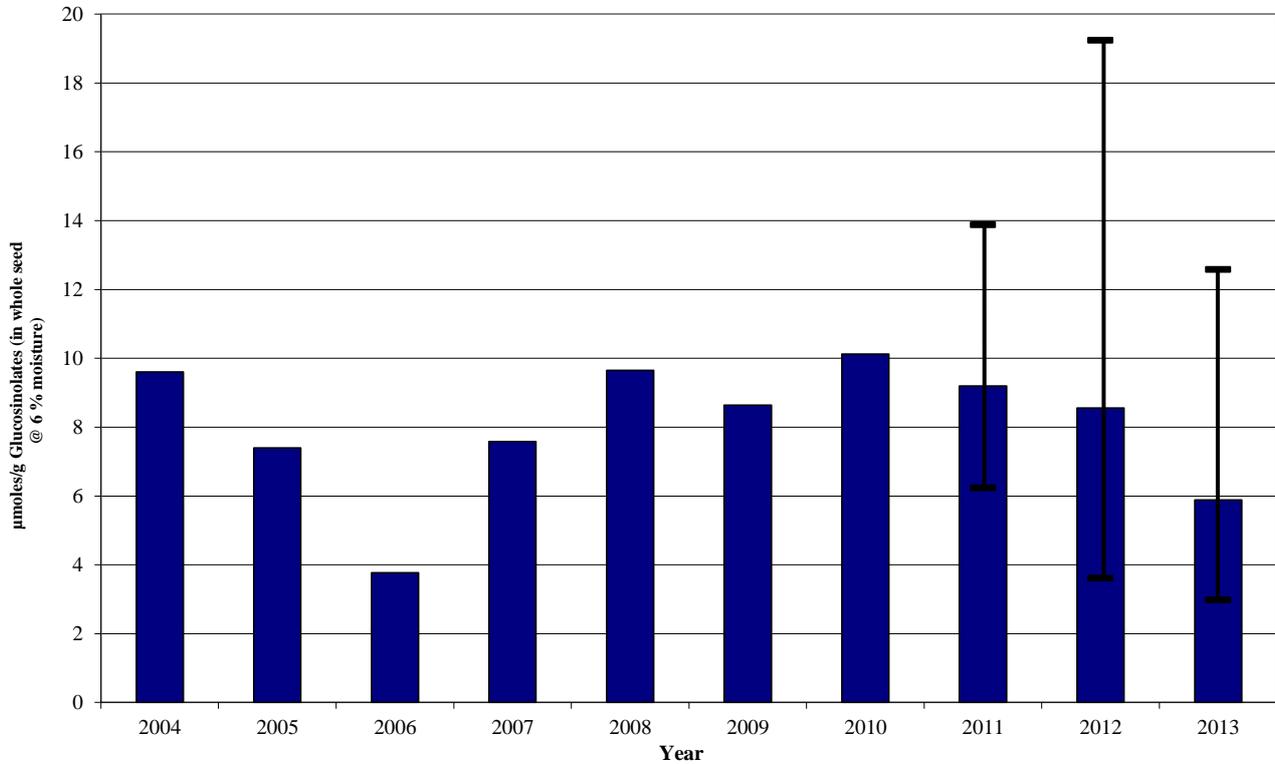


Figure 7: Average Australian glucosinolate content 2004 – 2013

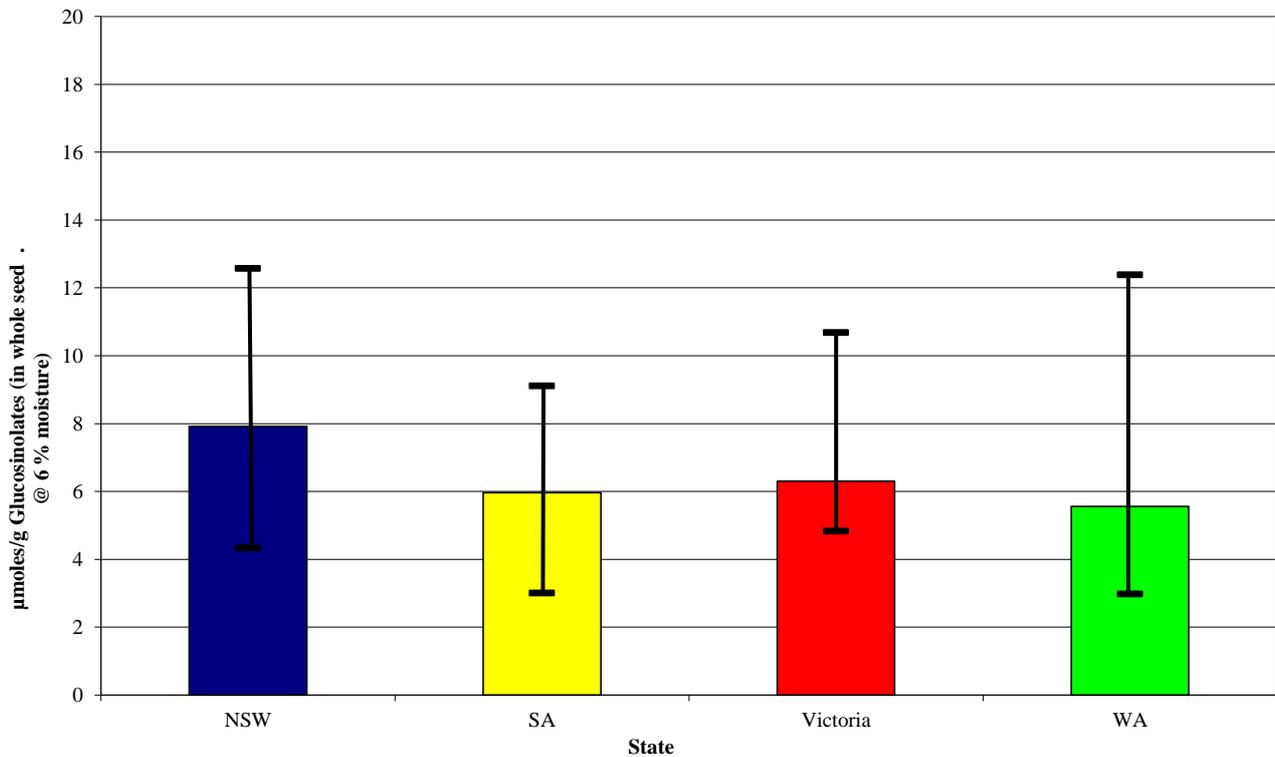


Figure 8: Average glucosinolate content by state 2013
 Bars show the minimum and maximum for each range

Fatty Acid Composition

Oleic Acid

The average oleic acid (C18:1) concentration in the oil produced from the 2013 harvest was 62.8 %, a minor decrease from the record set in 2012. The oleic concentration ranged from 59.3 % for the CAN1 grade for the McLevie Region in Western Australia to 69.6 % at Trajere in New South Wales.

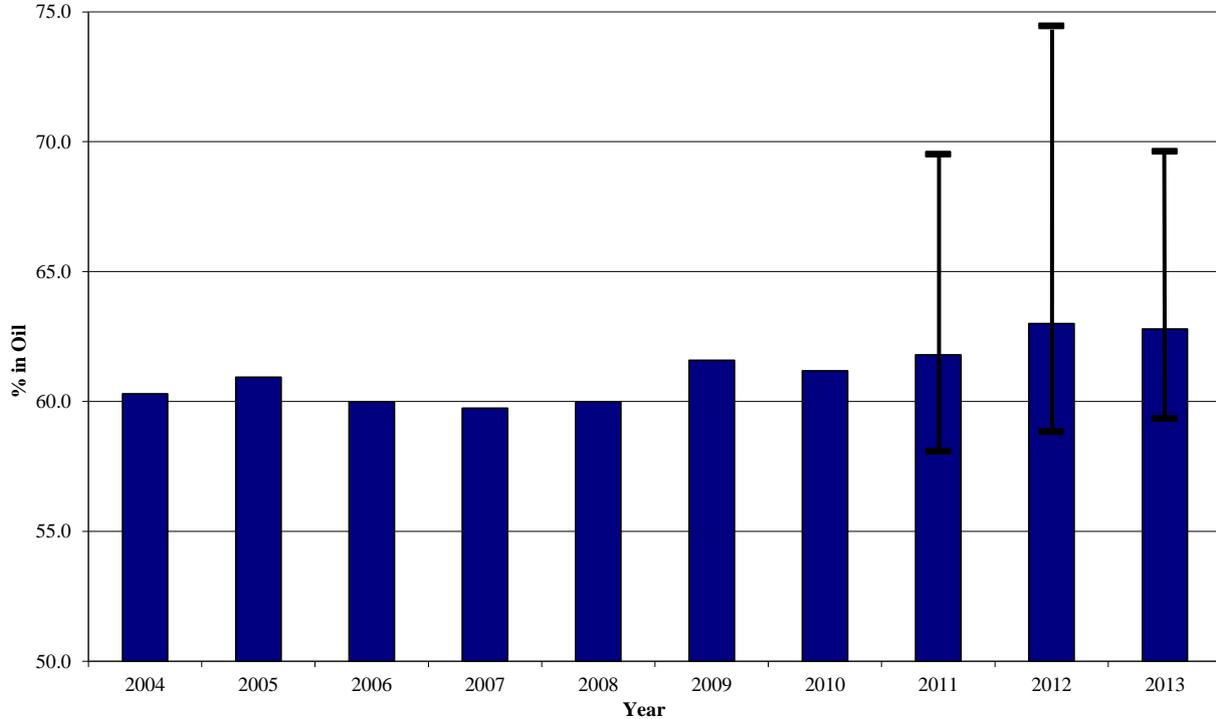


Figure 9: Average Australian oleic acid concentration in canola oil 2004 – 2013

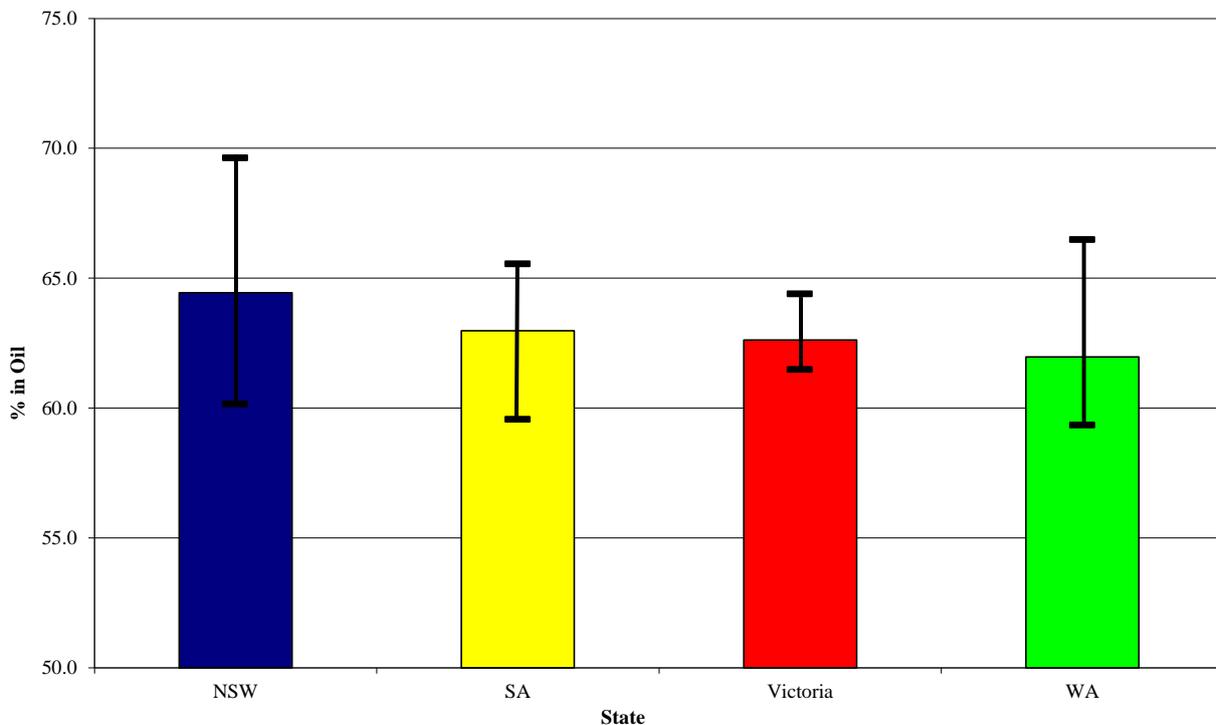


Figure 10: Average oleic acid concentration by state 2013
Bars show the minimum and maximum for each range

Linoleic Acid

The average linoleic acid (C18:2) concentration in oil produced from the 2013 harvest was 18.2 %, the same as last year and the equal lowest in the twenty year history of this book. The concentration ranged from 12.9 % at Trajere to 23.9 % at Condobolin, both in New South Wales.

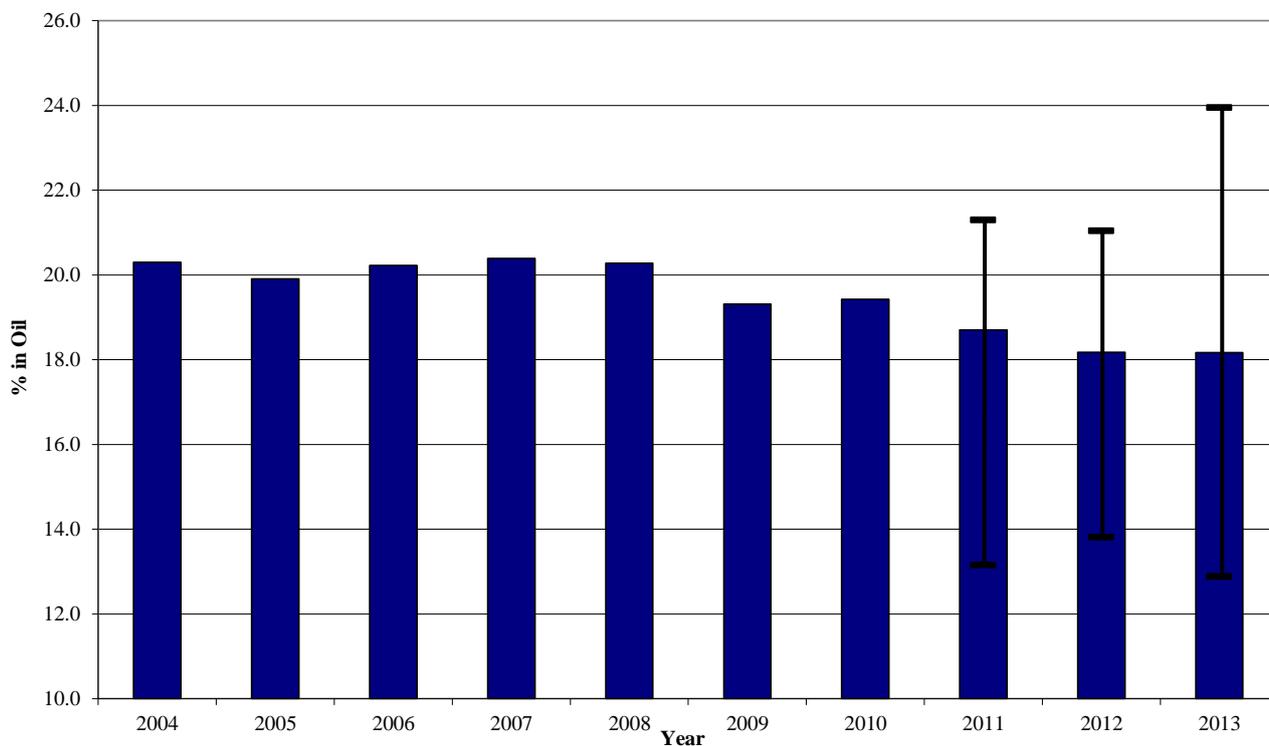


Figure 11: Average Australian linoleic acid concentration in canola oil 2004 – 2013

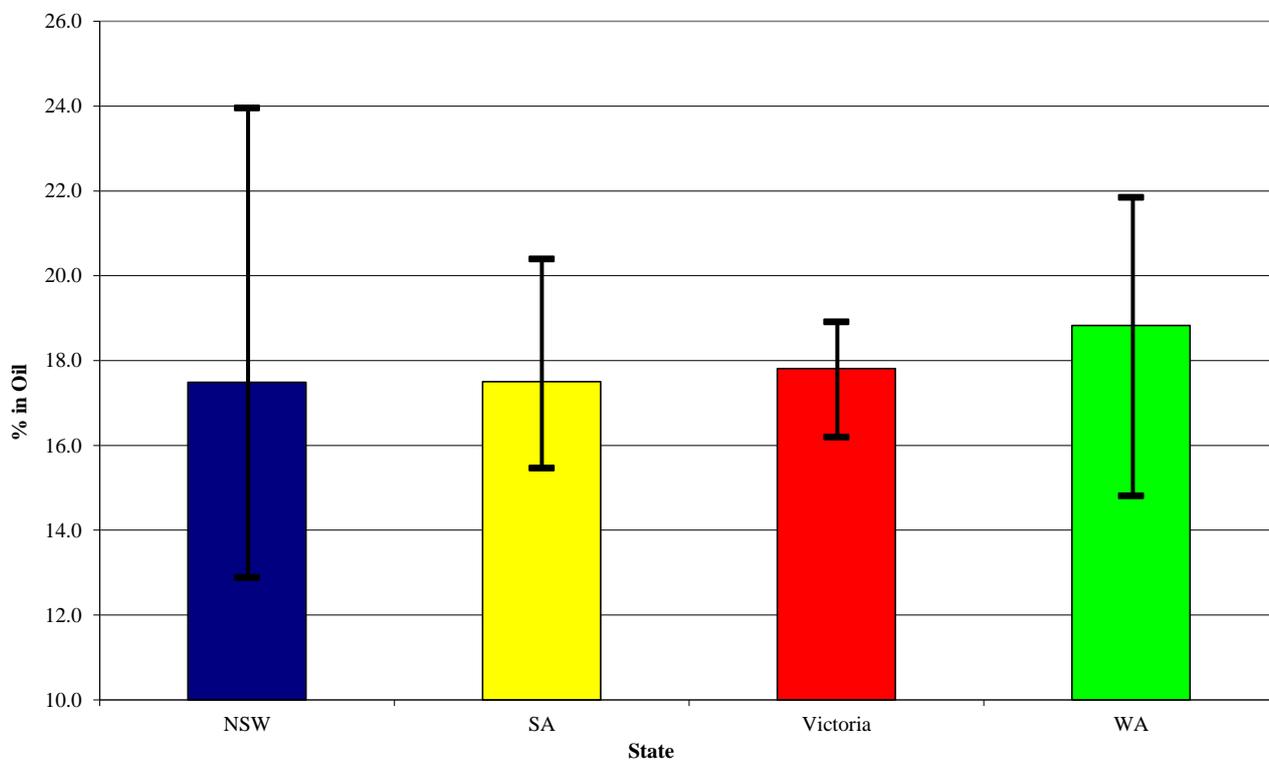


Figure 12: Average linoleic acid concentration by state 2013
Bars show the minimum and maximum for each range

Linolenic Acid

The linolenic acid (C18:3) concentration for 2013 was 10.2 % this was a minor 0.3 % higher than the 2012 harvest. Linolenic acid concentrations ranged from 3.0 % at Condobolin in New South Wales to 11.6 % at Millicent in South Australia.

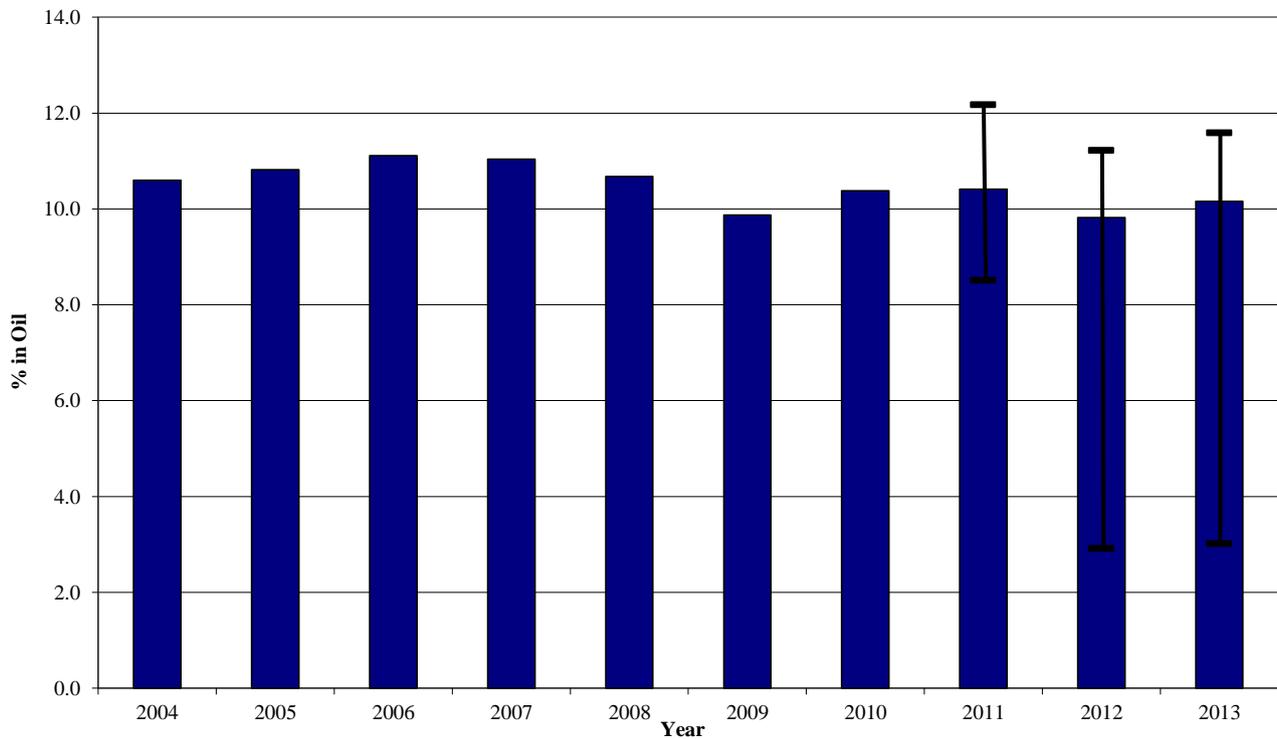


Figure 13: Average Australian linolenic concentration in canola oil 2004 – 2013

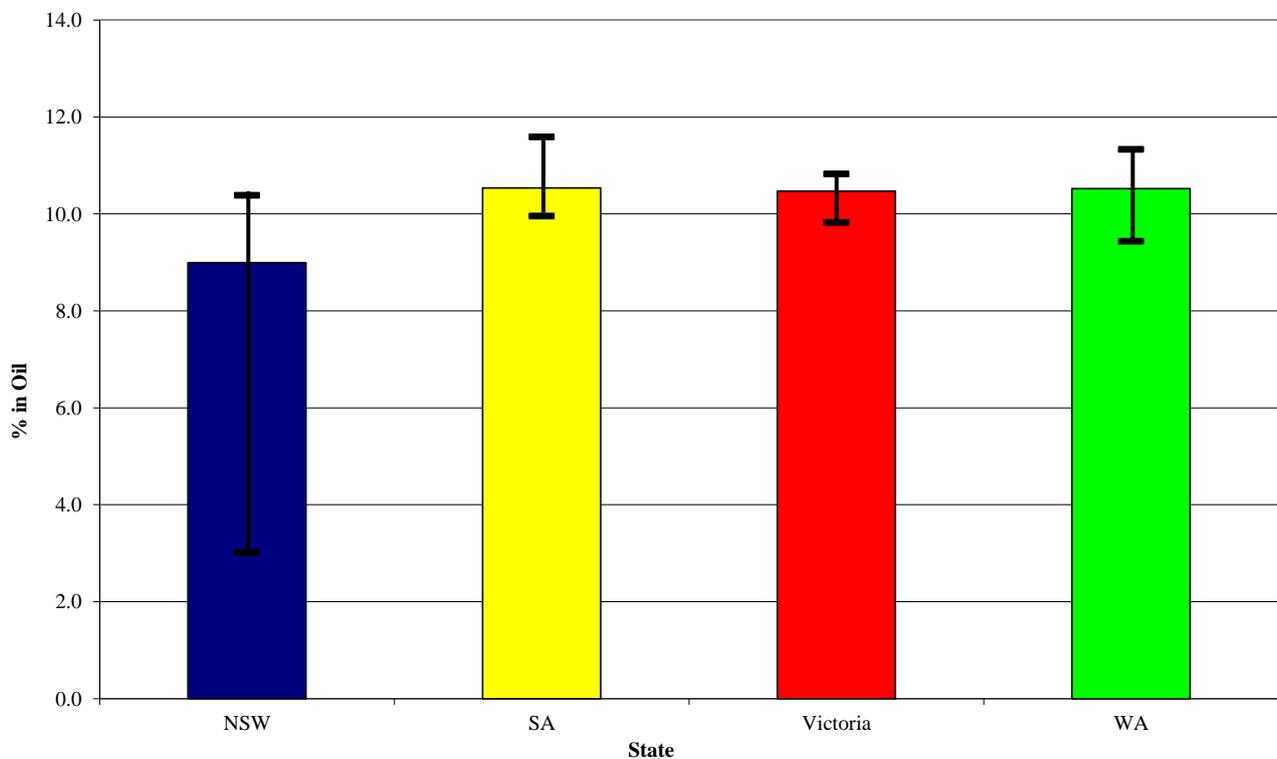


Figure 14: Average linolenic acid concentration by state 2013
Bars show the minimum and maximum for each range

Saturated Fatty Acid

The average saturated fatty acid concentration for the 2013 harvest was 7.3 %, exactly the same as last years' harvest. Saturated fatty acid concentration ranged from 6.7 % at multiple sites in Western Australia (Bokal, Broomehill, Cranbrook, Geraldton and MGC) to 8.3 % at Stockinbingal in New South Wales.

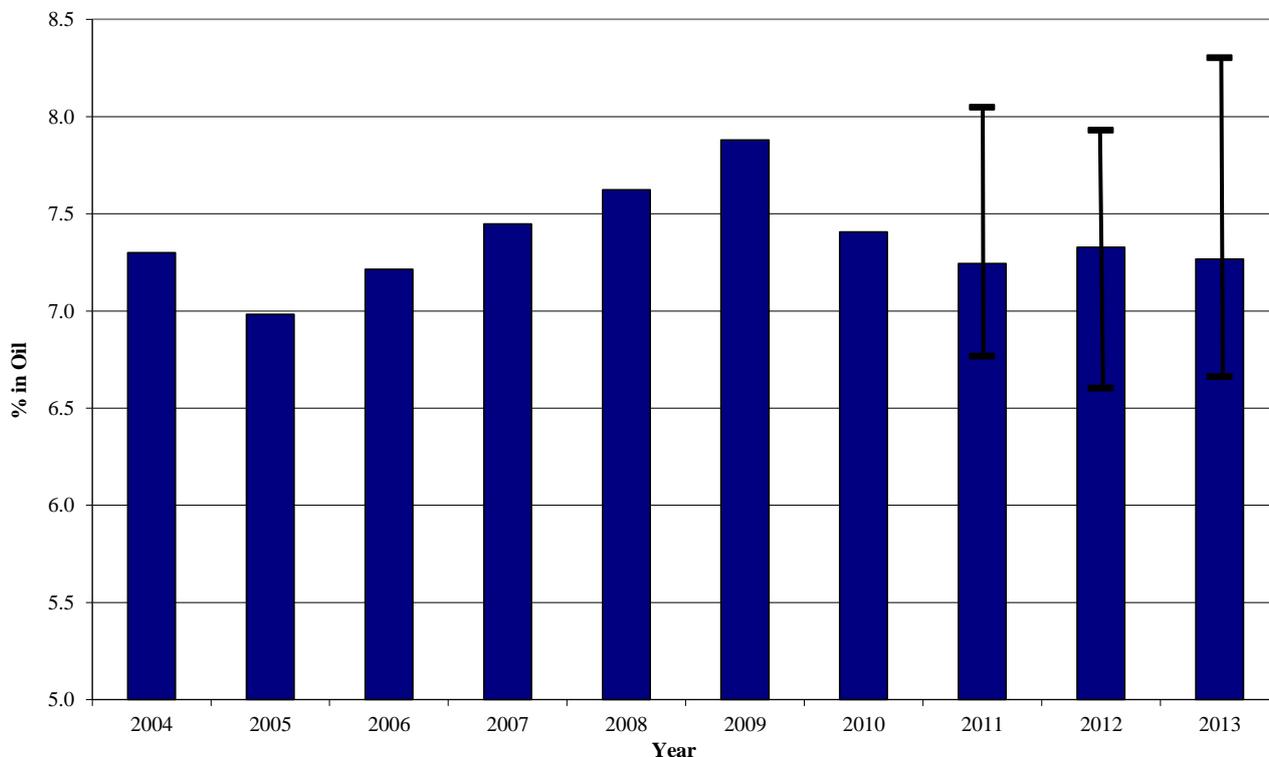


Figure 15: Average Australian saturated fatty acid concentration in canola oil 2004 – 2013

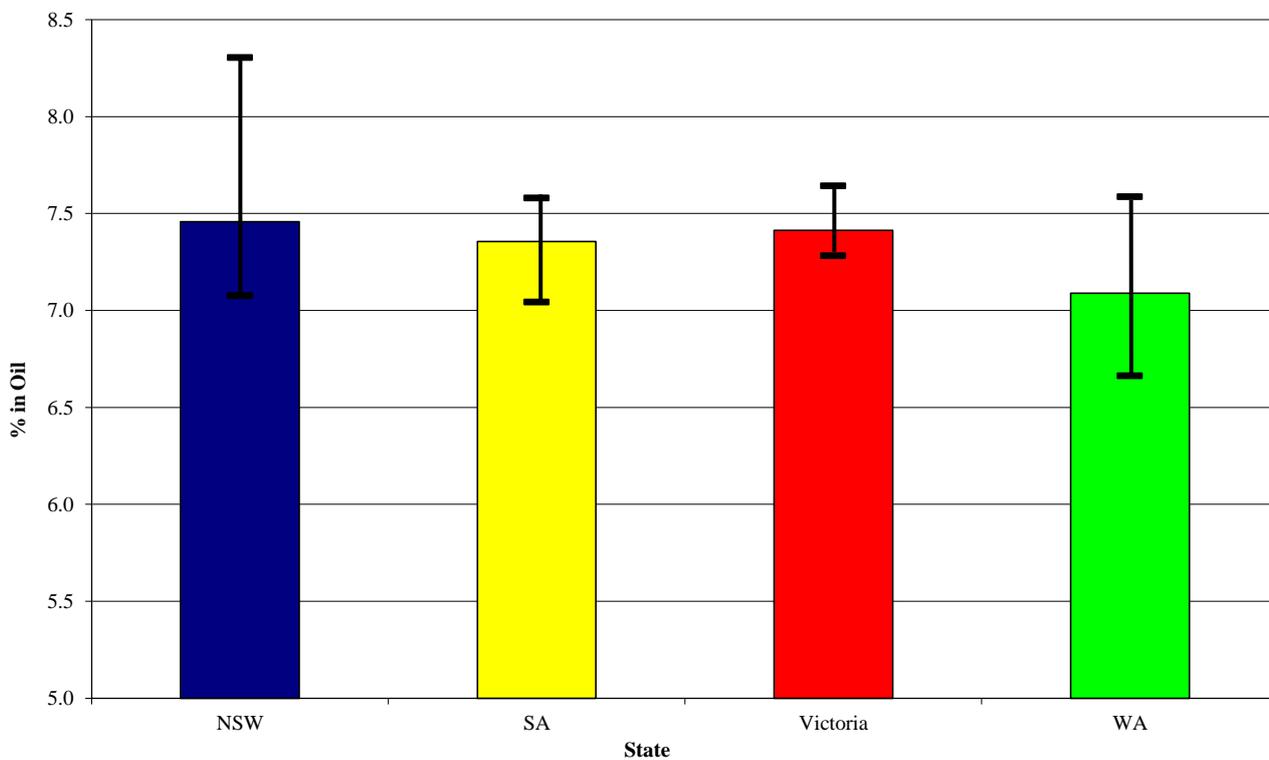


Figure 16: Average saturated fatty acid concentration by state 2013
Bars show the minimum and maximum for each range

Iodine Value

The average Iodine Value for the 2013 harvest was 113.1. This is the second lowest since 2004, with the lowest occurring last year at 112.5. Iodine Value ranged from 105.2 at Condobolin in New South Wales to 117.5 at Geraldton in Western Australia.

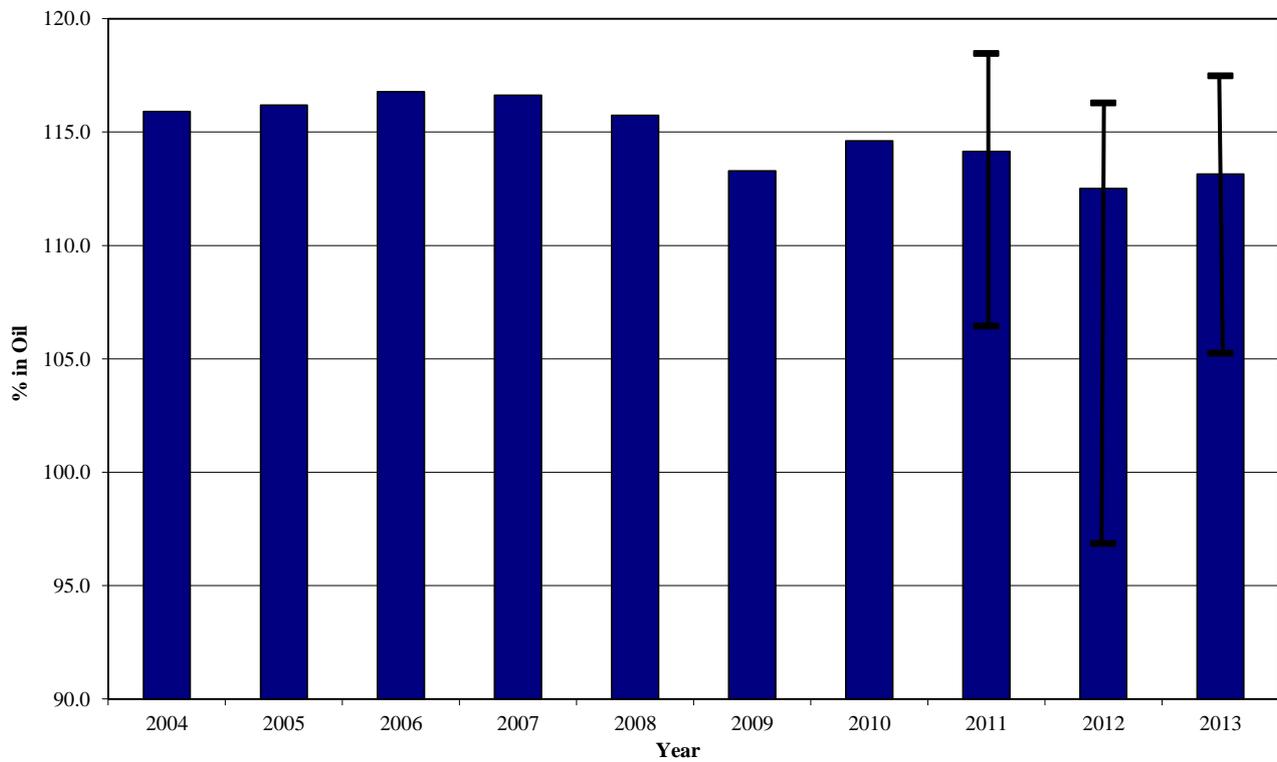


Figure 17: Average Australian Iodine Value in canola oil 2004 – 2013

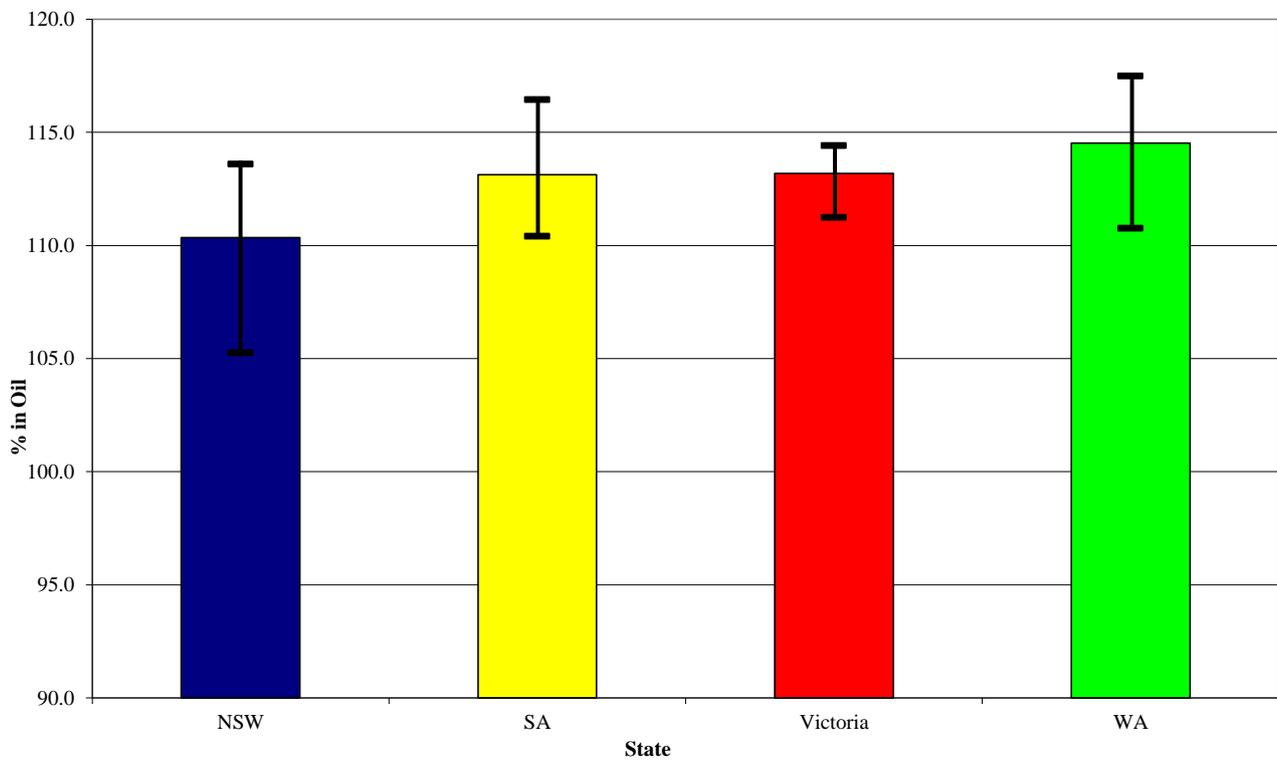


Figure 18: Average Iodine Value by state 2013

Bars show the minimum and maximum for each range

Quality Data by State

Table 3: Quality Data – New South Wales

<u>Region/ Zone/</u>		³ Glucosinolates			⁴ Grain Weight	
Receiveal Site	Grade	¹ Oil	² Protein	µmoles/g	lbs/b	kg/hL
<u>Northern NSW</u>						
Moree						
Moree-Haddads	CAN	40.5	43.7	7	54.2	67.6
Werris Creek						
Neilrex	CAN	42.5	43.2	8	53.5	66.6
Premer	CAN	41.6	43.6	7	54.0	67.3
Quirindi	CAN	41.3	42.9	8	53.9	67.1
Northern Mean		40.9	43.4	8	54.0	67.4
<u>Central NSW</u>						
Dubbo						
Curban	CAN	41.1	43.0	8	54.6	68.0
Manildra	CAN	43.1	39.1	8	53.6	66.8
Mungeribar	CAN	41.6	41.4	7	53.6	66.8
Narwonah	CAN	44.7	35.7	9	54.0	67.3
Nyngan	CAN	44.9	38.6	9	53.4	66.5
Parkes						
Back Creek	CAN	42.0	37.4	10	54.6	68.0
Bogan Gate	CAN	43.7	37.0	11	53.7	66.9
Bribbaree	CAN	41.7	38.6	8	54.2	67.5
Canowindra	CAN	42.2	38.9	7	54.0	67.3
Caragabal	CAN	43.0	37.5	4	53.8	67.0
Condobolin	CAN	42.4	38.2	8	53.8	67.0
Condobolin	CAMM	43.1	38.1	4	53.8	67.0
Cowra	CAN	43.3	40.5	7	53.6	66.8
Greenethorpe	CAN	42.4	39.5	10	53.8	67.0
Milvale	CAN	41.8	39.2	9	54.1	67.4
Parkes Sub	CAN	44.2	37.6	10	53.6	66.8
Parkes Sub	CANG	43.6	37.7	6	53.7	66.9
Red Bend	CAN	43.3	38.4	7	54.0	67.3
Trajere	CAN	44.8	34.7	13	53.6	66.8
Central Mean		42.8	38.6	8	53.8	67.1
<u>Southern NSW</u>						
Griffith						
Barellan	CAN	45.1	37.6	9	54.0	67.3
Coleambally	CAN	43.8	38.2	7	53.8	67.0
Hanwood	CAN	44.1	39.2	8	52.3	65.2
Narrandera	CAN	45.2	38.6	5	54.3	67.7
Tabbita	CAN	44.4	38.5	8	53.6	66.8
Wagga Wagga						
Boorowa	CAN	43.1	39.0	8	54.4	67.8
Boree Creek	CAN	42.4	39.8	8	53.5	66.6
Coolamon	CAN	42.4	39.0	6	54.0	67.3
Cootamundra	CAN	44.0	38.4	7	54.0	67.3
Culcairn	CAN	44.1	37.6	6	53.5	66.7
Harden	CAN	43.4	39.4	10	53.9	67.2
Henty West	CAN	45.4	37.5	7	53.3	66.5
Junee	CAN	43.6	38.7	8	54.3	67.7
Lockhart	CANG	43.5	37.5	6	53.7	66.9
Matong	CAN	42.1	38.9	9	53.6	66.8
Milbrulong	CAN	43.7	38.7	5	53.4	66.6

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

<u>Region/ Zone/</u>		³ Glucosinolates			⁴ Grain Weight	
Receival Site	Grade	¹ Oil	² Protein	µmoles/g	lbs/b	kg/hL
Wagga Wagga cont.						
Pleasant Hills	CAN	45.1	36.5	8	53.4	66.5
Rand	CAN	42.5	38.2	9	54.4	67.8
Yuluma	CAN	42.4	37.9	8	54.2	67.6
West Wyalong						
Ardlethan	CAN	42.8	38.4	9	54.4	67.8
Ariah Park	CAN	41.5	39.5	8	54.4	67.8
Maimuru	CAN	44.2	38.8	8	53.5	66.7
Stockinbingal	CANG	43.5	37.5	7	54.3	67.7
Temora	CAN	41.8	38.4	9	54.3	67.6
Southern Mean		43.5	38.3	8	53.9	67.1
<u>NSW Mean</u>		<u>42.7</u>	<u>39.1</u>	<u>8</u>	<u>53.9</u>	<u>67.1</u>
<i>NSW Min</i>		<i>40.5</i>	<i>34.7</i>	<i>4</i>	<i>52.3</i>	<i>65.2</i>
<i>NSW Max</i>		<i>45.4</i>	<i>43.7</i>	<i>13</i>	<i>54.6</i>	<i>68.0</i>

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

<u>Port/ Zone/</u>				³ Glucosinolates	⁴ Grain Weight	
Receival Site	Grade	¹ Oil	² Protein	µmoles/g	lbs/b	kg/hL
<u>Portland/Geelong</u>						
Portland						
Dooen	CANO	44.4	38.5	7	53.1	66.1
Portland/Geelong Mean		44.4	38.5	7	53.1	66.1
<u>Port Adelaide</u>						
Adelaide Area						
Port Adelaide	CANO	44.6	40.4	3	54.2	67.5
Murray Mallee						
Parilla	CANO	43.8	40.3	5	54.8	68.3
Northern Area						
Andrews	CANO	44.8	36.0	7	53.8	67.0
Bowmans	CANO	45.3	36.9	7	53.2	66.3
Gladstone	CANO	44.3	37.7	7	54.2	67.5
Roseworthy	CANO	44.9	37.2	9	53.6	66.8
South East						
Frances	CANO	45.6	36.9	7	53.6	66.8
Keith	CANO	44.8	37.4	6	54.0	67.3
Millicent	CANO	49.4	36.1	3	53.0	66.0
Tailem Bend	CANO	44.7	38.1	6	54.0	67.3
Wolseley	CANO	45.2	37.0	7	53.4	66.5
Port Adelaide Mean		45.1	37.5	7	53.6	66.9
<u>Port Giles</u>						
Yorke Peninsula						
Ardrossan	CANO	44.3	38.0	6	53.2	66.3
Port Giles Mean		44.3	38.0	6	53.2	66.3
<u>Port Lincoln</u>						
Eyre Peninsula						
Cummins	CANO	46.1	37.8	5	52.3	65.3
Port Lincoln	CANO	46.6	37.2	5	53.0	66.0
Rudall	CANO	45.7	36.6	6	54.0	67.3
Ungarra	CANO	46.1	36.7	4	54.6	68.0
Yeelanna	CANO	45.6	37.4	6	53.4	66.5
Port Lincoln Mean		46.3	37.4	5	52.9	65.9
<u>SA Mean</u>		<u>45.4</u>	<u>37.5</u>	<u>6</u>	<u>53.3</u>	<u>66.5</u>
<i>SA Min</i>		<i>43.8</i>	<i>36.0</i>	<i>3</i>	<i>52.3</i>	<i>65.3</i>
<i>SA Max</i>		<i>49.4</i>	<i>40.4</i>	<i>9</i>	<i>54.8</i>	<i>68.3</i>

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

<u>Region/ Zone/</u>	<u>Grade</u>	¹ <u>Oil</u>	² <u>Protein</u>	³ <u>Glucosinolates</u> <u>µmoles/g</u>	⁴ <u>Grain Weight</u> <u>lbs/b</u>	<u>kg/hL</u>
<u>North West Vic</u>						
Horsham	CAN	42.7	40.9	7	54.4	67.8
Ouyen	CAN	44.7	37.4	9	53.6	66.8
Swan Hill	CAN	42.3	38.5	11	53.8	67.0
North West Mean		42.9	40.1	7	54.2	67.5
<u>South East Vic</u>						
Marong East	CAN	46.4	37.6	5	53.1	66.1
Marong South	CAN	43.6	37.8	6	54.5	67.9
South East Mean		45.1	37.7	6	53.7	66.9
<u>Victoria Mean</u>						
		44.2	38.7	6	53.9	67.2
Victoria Min		42.3	37.4	5	53.1	66.1
Victoria Max		46.4	40.9	11	54.5	67.9

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 6: Quality Data – Western Australia

Port Zone/ Receival Site		Grade	¹ Oil	² Protein	³ Glucosinolates µmoles/g	⁴ Grain Weight lbs/b kg/hL	
Albany							
Albany	CAN1		46.7	36.0	6	53.3	66.4
Bokal	CAN1		46.0	35.5	11	53.2	66.3
Boyup Brook	CAN1		45.9	36.4	7	53.6	66.8
Broomehill	CAN1		48.7	35.1	4	53.7	66.9
Cranbrook	CAN1		47.5	35.4	6	53.7	66.9
Darken	CAG1		46.8	36.4	4	52.9	65.9
Dumbleyung	CAN1		46.6	33.3	10	53.4	66.5
Hyden	CAN1		47.4	36.6	3	54.0	67.3
Karlgarin	CAN1		45.1	36.9	7	53.8	67.0
Katanning	CAN1		49.6	34.8	3	53.6	66.8
Kojoneerup	CAN1		47.1	38.1	3	53.0	66.0
Kojonup	CAN1		46.6	36.7	7	53.8	67.0
Lake Grace	CAN1		47.0	35.8	6	53.6	66.8
Newdegate	CAN1		47.0	35.1	7	53.8	67.0
Nyabing	CAN1		47.9	35.0	3	53.8	67.0
Tambellup	CAG1		48.4	34.6	6	53.0	66.0
Albany Zone Mean			47.2	35.7	6	53.5	66.6
Esperance							
Esperance	CAG1		46.7	36.8	3	53.7	66.9
Esperance	CAN1		46.3	36.9	5	54.1	67.4
Esperance	CAN1HE		46.2	36.2	4	53.8	67.0
Lake Varley	CAN1		45.7	35.6	10	53.7	66.9
Mt Madden	CAN1		47.1	35.7	6	53.7	66.9
Ravensthorpe	CAN1		47.2	35.9	5	52.8	65.8
Esperance Zone Mean			46.5	36.2	5	53.6	66.8
Geraldton							
Geraldton	CAG1		46.2	38.2	4	53.6	66.8
Geraldton	CAN1		45.5	39.3	4	53.4	66.5
Northampton	CAN1		44.8	41.0	5	53.2	66.3
Geraldton Zone Mean			45.5	39.5	4	53.4	66.5
Kwinana							
Avon	CANHK		46.4	37.7	3	53.9	67.1
Doodlakine	CAN1		44.1	37.7	8	54.3	67.6
Greenhills	CAG1		49.1	36.9	5	52.3	65.3
Jennacubbine	CAG1		46.5	37.1	5	54.0	67.3
Kalannie	CAN1		43.2	39.1	6	54.3	67.6
Kellerberrin	CAN1		46.1	37.0	3	53.8	67.0
Kondut	CAG1		46.9	37.6	5	54.0	67.3
Koorda	CAN1		45.4	38.9	3	54.5	67.9
Manmanning	CAN1		43.5	38.7	5	54.5	67.9
McLevie	CAN1		44.1	38.3	4	54.0	67.3
MGC	CAG1		46.6	37.2	3	53.3	66.4
MGC	CAN1		47.9	34.7	7	52.8	65.8
Moora	CAN1		45.3	37.5	3	54.4	67.8
Mukinbudin	CAN1		46.2	35.4	12	53.5	66.6
Narrakine	CAN1		47.2	34.1	10	52.9	65.9
Narrakine	CANHK		47.8	35.8	7	53.6	66.8
Nembudding	CAN1		45.3	37.8	3	54.1	67.4

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/ Receiveal Site		Grade	¹ Oil	² Protein	³ Glucosinolates µmoles/g	⁴ Grain Weight lbs/b kg/hL	
Kwinana cont.							
Regans Ford	CAN1		45.3	37.6	8	53.6	66.8
Wagin	CAN1		45.1	35.6	10	53.8	67.0
Wongan Hills	CAG1		45.8	36.1	6	53.9	67.1
York	CAN1		46.8	36.0	6	53.4	66.5
Yoting	CAN1		46.4	36.6	5	53.3	66.4
Kwinana Zone Mean			45.9	37.0	6	53.7	66.9
WA Mean			46.4	36.7	6	53.6	66.8
<i>WA Min</i>			<i>43.2</i>	<i>33.3</i>	<i>3</i>	<i>52.3</i>	<i>65.3</i>
<i>WA Max</i>			<i>49.6</i>	<i>41.0</i>	<i>12</i>	<i>54.5</i>	<i>67.9</i>

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

<u>Region/ Zone/</u>																		² Iodine	
Receival Site	Grade	14:0	16:0	16:1	17:0	17:1	18:0	18:1	18:2	18:3	20:0	20:1	22:0	22:1	24:0	24:1	Total	¹ Sat.	Value
<u>Northern NSW</u>																			
Moree																			
Moree-Haddads	CAN	0.1	3.9	0.3	0.2	0.2	2.3	64.7	17.1	9.4	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.2	111.0
Werris Creek																			
Neilrex	CAN	0.1	4.3	0.3	0.2	0.1	2.3	63.5	18.5	8.5	0.6	1.1	0.3	0.1	0.1	0.1	100	7.8	110.1
Premier	CAN	0.1	4.1	0.3	0.2	0.1	2.2	64.5	17.7	8.7	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.5	110.0
Quirindi	CAN	0.1	4.1	0.3	0.2	0.2	2.2	63.9	18.4	8.6	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.5	110.4
Northern NSW Mean		0.1	4.1	0.3	0.2	0.2	2.2	64.4	17.6	8.9	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.5	110.2
<u>Central NSW</u>																			
Dubbo																			
Curban	CAN	0.1	4.2	0.3	0.2	0.2	2.1	62.3	19.2	9.5	0.5	1.0	0.3	0.1	0.1	0.1	100	7.4	112.7
Manildra	CAN	0.1	4.2	0.3	0.1	0.1	2.1	65.3	16.8	8.7	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.5	109.3
Mungeribar	CAN	0.1	4.3	0.3	0.2	0.2	2.1	62.6	18.9	9.4	0.5	1.0	0.3	0.1	0.1	0.1	100	7.5	112.2
Narwonah	CAN	0.1	4.5	0.3	0.2	0.2	2.1	63.7	18.5	8.5	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.8	110.1
Nyngan	CAN	0.1	4.1	0.3	0.2	0.2	2.1	62.4	18.7	10.1	0.4	0.9	0.2	<0.1	0.1	0.1	100	7.3	113.5
Parkes																			
Back Creek	CAN	0.1	4.2	0.3	0.1	0.1	1.9	65.7	16.1	9.1	0.6	1.1	0.3	<0.1	0.2	0.1	100	7.4	109.4
Bogan Gate	CAN	0.1	4.1	0.3	0.1	0.1	1.9	67.2	15.0	8.9	0.6	1.2	0.4	<0.1	0.1	0.1	100	7.2	108.2
Bribbaree	CAN	0.1	4.4	0.3	0.1	0.1	1.9	65.4	16.4	9.0	0.6	1.1	0.4	<0.1	0.1	0.1	100	7.6	109.4
Canowindra	CAN	0.1	4.3	0.3	0.1	0.1	2.0	65.4	16.5	8.9	0.6	1.1	0.4	<0.1	0.1	0.2	100	7.6	109.1
Caragabal	CAN	0.1	4.2	0.3	0.1	0.1	1.8	65.4	16.3	9.3	0.6	1.1	0.3	0.1	0.1	0.1	100	7.3	109.9
Condobolin	CAMM	0.1	4.4	0.3	0.1	0.2	2.4	64.0	23.9	3.0	0.4	0.8	0.2	<0.1	0.1	0.1	100	7.7	105.2
Condobolin	CAN	0.1	4.4	0.3	0.2	0.2	2.0	62.4	19.0	9.5	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.5	112.5
Cowra	CAN	0.1	4.2	0.3	0.2	0.2	2.0	64.8	17.0	9.0	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.4	110.0
Greenethorpe	CAN	0.1	4.4	0.3	0.1	0.1	2.0	64.8	16.7	9.2	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.7	109.9
Milvale	CAN	0.1	4.3	0.3	0.2	0.1	1.9	65.3	16.2	9.1	0.6	1.2	0.4	<0.1	0.1	0.1	100	7.6	109.3
Parkes Sub	CAN	0.1	4.1	0.3	0.1	0.1	2.0	65.5	16.4	9.1	0.5	1.1	0.3	<0.1	0.1	0.1	100	7.4	109.7
Parkes Sub	CANG	0.1	4.2	0.3	0.1	0.1	2.4	62.4	19.0	9.3	0.6	1.0	0.3	<0.1	0.1	0.1	100	7.8	111.9
Red Bend	CAN	0.1	4.2	0.3	0.1	0.1	2.0	64.8	17.0	9.1	0.6	1.1	0.3	0.1	0.1	0.1	100	7.4	110.2
Trajere	CAN	0.1	4.0	0.3	0.1	0.1	1.8	69.6	12.9	8.7	0.6	1.2	0.3	<0.1	0.1	0.1	100	7.1	106.2
Central NSW Mean		0.1	4.2	0.3	0.1	0.1	2.0	64.5	17.5	8.9	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.4	110.3
<u>Southern NSW</u>																			
Griffith																			
Barellan	CAN	0.1	4.0	0.3	0.2	0.1	2.1	64.1	16.8	10.4	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.3	112.3
Coleambally	CAN	0.1	4.2	0.3	0.1	0.1	1.9	63.9	17.4	9.9	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.2	112.1
Hanwood	CAN	0.1	4.1	0.3	0.2	0.1	2.2	63.8	17.1	10.1	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.4	112.0
Narrandera	CAN	0.1	4.5	0.3	0.1	0.1	1.9	62.1	19.4	9.6	0.5	0.9	0.3	<0.1	0.1	0.1	100	7.5	113.1
Tabbita	CAN	0.1	4.1	0.3	0.2	0.2	2.2	63.3	17.3	10.3	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.4	112.5
Wagga Wagga																			
Boorowa	CAN	0.1	4.2	0.3	0.1	0.1	1.9	65.0	16.6	9.2	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.4	110.0
Boree Creek	CAN	0.1	4.2	0.3	0.1	0.1	2.0	65.1	16.5	9.3	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.5	110.1
Coolamon	CAN	0.1	4.4	0.3	0.2	0.1	2.1	62.9	18.5	9.3	0.6	1.0	0.3	<0.1	0.1	0.1	100	7.8	111.6
Cootamundra	CAN	0.1	4.2	0.3	0.2	0.1	2.1	65.2	16.5	9.1	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.5	109.6
Culcairn	CAN	0.1	4.2	0.3	0.1	0.1	1.9	62.8	18.2	10.2	0.5	1.1	0.3	<0.1	0.1	0.1	100	7.2	113.3
Harden	CAN	0.1	4.2	0.3	0.2	0.2	2.0	64.7	16.8	9.4	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.4	110.4
Henty West	CAN	0.1	4.1	0.3	0.1	0.1	2.0	65.2	16.4	9.6	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.2	110.6
Junee	CAN	0.1	4.2	0.3	0.1	0.1	2.0	65.1	16.5	9.2	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.5	109.7
Lockhart	CANG	0.1	4.7	0.3	0.2	0.1	2.3	61.2	19.0	10.0	0.5	1.0	0.3	<0.1	0.1	0.1	100	8.2	112.8
Matong	CAN	0.1	4.4	0.3	0.2	0.1	2.2	63.1	17.8	9.6	0.6	1.0	0.3	<0.1	0.1	0.1	100	7.9	111.3
Milbrulong	CAN	0.1	4.3	0.3	0.2	0.1	2.1	64.0	17.1	9.6	0.6	1.1	0.4	<0.1	0.1	0.1	100	7.7	110.8
Pleasant Hills	CAN	0.1	4.2	0.3	0.2	0.1	2.1	63.3	17.3	10.1	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.6	112.1
Rand	CAN	0.1	4.3	0.3	0.2	0.1	2.0	64.8	16.4	9.5	0.6	1.1	0.4	<0.1	0.1	0.2	100	7.6	110.1
Yuluma	CAN	0.1	4.4	0.3	0.2	0.1	2.1	63.9	17.3	9.5	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.7	110.8

¹Sat - Sum of the saturated fatty acids including 14:0, 16:0, 17:0, 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

<u>Region/ Zone/</u>																	² Iodine		
<u>Receival Site</u>	<u>Grade</u>	<u>14:0</u>	<u>16:0</u>	<u>16:1</u>	<u>17:0</u>	<u>17:1</u>	<u>18:0</u>	<u>18:1</u>	<u>18:2</u>	<u>18:3</u>	<u>20:0</u>	<u>20:1</u>	<u>22:0</u>	<u>22:1</u>	<u>24:0</u>	<u>24:1</u>	<u>Total</u>	¹ Sat.	<u>Value</u>
Wyalong																			
Ardlethan	CAN	0.1	4.4	0.3	0.1	0.1	2.0	65.3	16.3	9.1	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.6	109.4
Ariah Park	CAN	0.1	4.5	0.3	0.1	0.1	2.0	64.2	17.3	9.0	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.8	110.0
Maimuru	CAN	0.1	4.1	0.3	0.1	0.1	2.0	65.8	15.8	9.3	0.6	1.2	0.4	<0.1	0.1	0.1	100	7.4	109.4
Stockinbingal	CANG	0.1	4.9	0.3	0.2	0.1	2.1	60.1	19.9	10.0	0.6	1.0	0.4	<0.1	0.1	0.1	100	8.3	113.6
Temora	CAN	0.1	4.4	0.3	0.1	0.1	1.9	64.8	17.0	9.0	0.6	1.1	0.3	0.1	0.1	0.1	100	7.5	109.9
Southern NSW Mean		0.1	4.3	0.3	0.2	0.1	2.0	64.1	17.2	9.5	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.6	111.0
NSW Mean		0.1	4.2	0.3	0.2	0.1	2.0	64.4	17.5	9.0	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.5	110.4
<i>NSW Min</i>		<i>0.1</i>	<i>4.0</i>	<i>0.3</i>	<i>0.1</i>	<i>0.1</i>	<i>1.8</i>	<i>60.1</i>	<i>12.9</i>	<i>3.0</i>	<i>0.4</i>	<i>0.8</i>	<i>0.2</i>	<i><0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>100</i>	<i>7.1</i>	<i>105.2</i>
<i>NSW Max</i>		<i>0.1</i>	<i>4.9</i>	<i>0.3</i>	<i>0.2</i>	<i>0.2</i>	<i>2.4</i>	<i>69.6</i>	<i>23.9</i>	<i>10.4</i>	<i>0.6</i>	<i>1.2</i>	<i>0.4</i>	<i><0.1</i>	<i>0.2</i>	<i>0.2</i>	<i>100</i>	<i>8.3</i>	<i>113.6</i>

¹Sat - Sum of the saturated fatty acids including 14:0, 16:0, 17:0, 18:0, 20:0 and 24:0

² Iodine Value - Calculated from the fatty acid composition

Table 8: Fatty Acid Composition – South Australia

<u>Port/ Zone/</u>																	² Iodine		
<u>Receival Site</u>	<u>Grade</u>	<u>14:0</u>	<u>16:0</u>	<u>16:1</u>	<u>17:0</u>	<u>17:1</u>	<u>18:0</u>	<u>18:1</u>	<u>18:2</u>	<u>18:3</u>	<u>20:0</u>	<u>20:1</u>	<u>22:0</u>	<u>22:1</u>	<u>24:0</u>	<u>24:1</u>	<u>Total</u>	¹ Sat.	<u>Value</u>
<u>Portland/Geelong</u>																			
Portland																			
Dooen	CANO	0.1	4.0	0.3	0.2	0.1	1.9	64.4	16.4	10.4	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.1	112.3
Portland/Geelong Mean		0.1	4.0	0.3	0.2	0.1	1.9	64.4	16.4	10.4	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.1	112.3
<u>Port Adelaide</u>																			
Adelaide Area																			
Port Adelaide	CANO	0.1	4.4	0.3	0.2	0.1	1.9	61.6	18.8	10.6	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.4	114.4
Murray Mallee																			
Parilla	CANO	0.1	4.7	0.3	0.2	0.1	1.9	59.6	20.4	11.1	0.4	0.9	0.2	<0.1	0.1	0.1	100.0	7.6	116.4
Northern Area																			
Andrews	CANO	0.1	4.3	0.3	0.1	0.1	1.9	65.5	15.5	10.0	0.6	1.1	0.4	<0.1	0.1	0.2	100	7.4	110.4
Bowmans	CANO	0.1	4.2	0.3	0.2	0.1	2.1	63.5	16.9	10.4	0.6	1.0	0.3	<0.1	0.1	0.1	100	7.5	112.3
Gladstone	CANO	0.1	4.2	0.3	0.1	0.1	1.9	64.9	16.4	10.0	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.2	111.3
Roseworthy	CANO	0.1	4.3	0.3	0.1	0.1	2.0	64.2	16.4	10.2	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.6	111.4
South East																			
Frances	CANO	0.1	4.2	0.3	0.1	0.1	1.8	61.5	18.5	11.3	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.1	115.6
Keith	CANO	0.1	4.2	0.3	0.2	0.2	2.0	62.1	17.7	11.1	0.5	1.0	0.3	0.1	0.1	0.1	100	7.4	114.2
Millicent	CANO	0.1	4.1	0.3	0.2	0.1	1.8	61.3	18.4	11.6	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.0	116.0
Tailem Bend	CANO	0.1	4.2	0.3	0.2	0.2	2.0	62.8	17.4	10.8	0.5	1.0	0.3	0.1	0.1	0.1	100	7.3	113.5
Wolseley	CANO	0.1	4.2	0.3	0.2	0.2	1.9	62.5	17.6	10.8	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.5	113.5
Port Adelaide Mean		0.1	4.2	0.3	0.2	0.1	2.0	63.2	17.2	10.6	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.4	112.9
<u>Pt Giles</u>																			
Yorke Peninsula																			
Ardrossan	CANO	0.1	4.2	0.3	0.2	0.2	2.0	62.4	17.8	10.7	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.4	113.7
Port Giles Mean		0.1	4.2	0.3	0.2	0.2	2.0	62.4	17.8	10.7	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.4	113.7
<u>Pt Lincoln</u>																			
Eyre Peninsula																			
Cummins	CANO	0.1	4.2	0.3	0.2	0.1	1.9	63.7	16.9	10.4	0.5	1.1	0.3	0.1	0.1	0.1	100	7.3	112.5
Port Lincoln	CANO	0.1	4.3	0.3	0.1	0.1	1.8	61.7	19.0	10.5	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.3	114.4
Rudall	CANO	0.1	4.3	0.3	0.2	0.2	1.9	62.2	19.0	10.0	0.5	0.9	0.2	0.1	0.1	0.1	100	7.3	113.5
Ungarra	CANO	0.1	4.3	0.3	0.2	0.2	1.8	62.5	18.3	10.3	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.2	113.5
Yeelanna	CANO	0.1	4.1	0.3	0.2	0.2	2.0	63.2	17.6	10.3	0.5	1.0	0.3	0.1	0.1	0.1	100	7.2	112.9
Port Lincoln Mean		0.1	4.3	0.3	0.2	0.1	1.9	62.7	18.0	10.4	0.5	1.0	0.3	0.1	0.1	0.1	100	7.3	113.5
<u>SA Mean</u>		0.1	4.2	0.3	0.2	0.1	1.9	63.0	17.5	10.5	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.4	113.1
<i>SA Min</i>		<i>0.1</i>	<i>4.0</i>	<i>0.3</i>	<i>0.1</i>	<i>0.1</i>	<i>1.8</i>	<i>59.6</i>	<i>15.5</i>	<i>10.0</i>	<i>0.4</i>	<i>0.9</i>	<i>0.2</i>	<i><0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>100</i>	<i>7.0</i>	<i>110.4</i>
<i>SA Max</i>		<i>0.1</i>	<i>4.7</i>	<i>0.3</i>	<i>0.2</i>	<i>0.2</i>	<i>2.1</i>	<i>65.5</i>	<i>20.4</i>	<i>11.6</i>	<i>0.6</i>	<i>1.1</i>	<i>0.4</i>	<i>0.1</i>	<i>0.1</i>	<i>0.2</i>	<i>100</i>	<i>7.6</i>	<i>116.4</i>

¹Sat - Sum of the saturated fatty acids including 14:0, 16:0, 17:0, 18:0, 20:0 and 24:0

² Iodine Value - Calculated from the fatty acid composition

Table 9: Fatty Acid Composition – Victoria

<u>Region/ Zone</u>	Grade	14:0	16:0	16:1	17:0	17:1	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
<u>North West Vic</u>																			
Horsham Zone	CAN	0.1	4.3	0.3	0.1	0.1	1.8	64.4	16.2	10.3	0.5	1.2	0.3	0.1	0.1	0.2	100	7.3	111.7
Ouyen Zone	CAN	0.1	4.4	0.3	0.2	0.2	2.2	61.5	18.5	10.8	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.6	114.2
Swan Hill Zone	CAN	0.1	4.4	0.3	0.1	0.2	1.9	63.9	17.0	9.8	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.5	111.2
North West Mean		0.1	4.3	0.3	0.2	0.1	1.9	63.9	16.6	10.3	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.4	112.0
<u>South East Vic</u>																			
Marong East Zone	CAN	0.1	4.4	0.3	0.2	0.3	1.8	61.5	18.9	10.6	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.3	114.4
Marong South Zone	CAN	0.1	4.3	0.3	0.2	0.2	2.3	62.0	18.3	10.5	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.6	113.6
South East Mean		0.1	4.4	0.3	0.2	0.3	2.0	61.7	18.6	10.6	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.5	114.0
<u>Victoria Mean</u>		0.1	4.3	0.3	0.2	0.2	2.0	62.6	17.8	10.5	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.4	113.2
<i>Victoria Min</i>		<i>0.1</i>	<i>4.3</i>	<i>0.3</i>	<i>0.1</i>	<i>0.1</i>	<i>1.8</i>	<i>61.5</i>	<i>16.2</i>	<i>9.8</i>	<i>0.5</i>	<i>0.9</i>	<i>0.2</i>	<i><0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>100</i>	<i>7.3</i>	<i>111.2</i>
<i>Victoria Max</i>		<i>0.1</i>	<i>4.4</i>	<i>0.3</i>	<i>0.2</i>	<i>0.3</i>	<i>2.3</i>	<i>64.4</i>	<i>18.9</i>	<i>10.8</i>	<i>0.6</i>	<i>1.2</i>	<i>0.3</i>	<i>0.1</i>	<i>0.1</i>	<i>0.2</i>	<i>100</i>	<i>7.6</i>	<i>114.4</i>

¹Sat - Sum of the saturated fatty acids including 14:0, 16:0, 17:0, 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		Grade	14:0	16:0	16:1	17:0	17:1	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	CAN1	0.1	4.0	0.3	0.1	0.1	1.7	63.1	17.2	11.1	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.8	114.4	
Bokal	CAN1	0.1	3.9	0.3	0.1	0.1	1.7	66.5	14.8	10.2	0.5	1.2	0.3	<0.1	0.1	0.2	100	6.7	110.7	
Boyup Brook	CAN1	0.1	4.0	0.3	0.1	0.1	1.8	63.8	17.5	10.2	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.9	113.0	
Broomehill	CAN1	0.1	4.0	0.3	0.1	0.1	1.7	64.3	16.8	10.7	0.5	1.1	0.3	<0.1	0.1	0.1	100	6.7	113.5	
Cranbrook	CAN1	0.1	4.1	0.3	0.1	0.1	1.7	63.4	17.3	10.9	0.5	1.2	0.3	<0.1	0.1	0.1	100	6.7	114.3	
Darken	CAG1	0.1	4.4	0.3	0.1	0.1	1.9	61.6	18.8	11.0	0.4	1.0	0.2	<0.1	0.1	0.1	100	7.1	115.4	
Dumbleyung	CAN1	0.1	4.1	0.3	0.1	0.1	1.7	64.2	16.8	10.6	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.9	113.1	
Hyden	CAN1	0.1	4.4	0.3	0.1	0.1	1.7	60.2	21.0	10.1	0.5	1.0	0.3	0.1	0.1	0.2	100	7.2	115.5	
Karlgarin	CAN1	0.1	4.4	0.3	0.1	0.1	1.8	60.5	19.7	10.6	0.6	1.2	0.3	0.1	0.1	0.2	100	7.4	115.0	
Katanning	CAN1	0.1	4.1	0.3	0.1	0.1	1.8	64.1	16.5	11.0	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.9	113.5	
Kojoneerup	CAN1	0.1	4.1	0.3	0.1	0.1	1.7	61.6	18.5	11.3	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.9	115.9	
Kojonup	CAN1	0.1	4.1	0.3	0.1	0.1	1.8	64.5	16.4	10.4	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.0	112.3	
Lake Grace	CAN1	0.1	4.5	0.3	0.1	0.1	1.7	60.2	20.4	10.5	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.3	115.7	
Newdegate	CAN1	0.1	4.3	0.3	0.1	0.1	1.7	61.9	19.0	10.3	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.2	114.2	
Nyabing	CAN1	0.1	4.5	0.3	0.1	0.1	1.7	60.1	20.2	10.9	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.3	116.3	
Tambellup	CAG1	0.1	4.5	0.3	0.1	0.1	1.9	61.8	18.9	10.4	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.4	114.1	
Albany Zone Mean			0.1	4.2	0.3	0.1	0.1	1.8	62.6	18.1	10.6	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.0	114.2
Esperance																				
Esperance	CAG1	0.1	4.5	0.3	0.1	0.1	2.0	61.1	18.9	10.9	0.5	1.0	0.2	<0.1	0.1	0.2	100	7.5	114.9	
Esperance	CAN1	0.1	4.4	0.3	0.1	0.1	1.7	62.2	18.3	10.9	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.1	114.6	
Esperance	CANIHE	0.1	4.2	0.3	0.1	0.1	1.7	62.7	17.9	10.8	0.5	1.1	0.3	0.1	0.1	0.2	100	6.9	114.4	
Lake Varley	CAN1	0.1	4.3	0.3	0.1	0.1	1.7	61.6	18.9	10.6	0.5	1.2	0.3	0.1	0.1	0.2	100	7.2	114.5	
Mt Madden	CAN1	0.1	4.2	0.3	0.1	0.1	1.8	62.8	18.1	10.6	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.0	114.2	
Ravensthorpe	CAN1	0.1	4.2	0.3	0.1	0.1	1.7	62.1	18.1	11.1	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.0	114.9	
Esperance Zone Mean			0.1	4.3	0.3	0.1	0.1	1.7	62.1	18.4	10.8	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.1	114.6
Geraldton																				
Geraldton	CAG1	0.1	4.3	0.3	0.2	0.2	1.9	61.4	19.3	10.4	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.3	114.6	
Geraldton	CAN1	0.1	4.2	0.3	0.1	0.1	1.6	59.5	21.5	10.7	0.4	1.0	0.3	<0.1	0.1	0.1	100	6.7	117.5	
Northampton	CAN1	0.1	4.2	0.3	0.1	0.2	1.6	60.4	20.5	10.6	0.5	1.1	0.3	<0.1	0.1	0.1	100	6.8	116.3	
Geraldton Zone Mean			0.1	4.2	0.3	0.1	0.2	1.7	60.4	20.4	10.6	0.5	1.1	0.2	<0.1	0.1	0.1	100	6.9	116.1
Kwinana																				
Avon	CANHK	0.1	4.4	0.3	0.1	0.1	1.7	61.4	20.1	10.3	0.4	0.9	0.2	<0.1	<0.1	0.1	100	6.8	115.6	
Doodlakine	CAN1	0.1	4.4	0.3	0.1	0.1	1.8	61.8	19.3	10.1	0.5	1.1	0.2	0.1	0.1	0.1	100	7.2	114.2	
Greenhills	CAG1	0.1	4.3	0.3	0.1	0.1	2.0	62.0	19.6	9.9	0.4	1.0	0.2	<0.1	<0.1	0.1	100	7.1	114.1	
Jennacubbine	CAG1	0.1	4.5	0.3	0.2	0.1	2.0	61.7	19.5	9.9	0.4	1.0	0.2	<0.1	0.1	0.1	100	7.4	113.8	
Kalannie	CAN1	0.1	4.6	0.3	0.1	0.1	1.7	60.1	21.4	9.8	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.3	115.3	
Kellerberrin	CAN1	0.1	4.5	0.3	0.1	0.1	1.8	60.2	20.5	10.5	0.5	1.0	0.2	0.1	0.1	0.2	100	7.3	115.8	
Kondut	CAG1	0.1	4.4	0.3	0.2	0.1	2.1	62.9	18.7	9.4	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	112.3	
Koorda	CAN1	0.1	4.6	0.3	0.1	0.1	1.8	60.6	21.0	9.5	0.4	0.9	0.2	<0.1	0.1	0.1	100	7.4	114.5	
Manmanning	CAN1	0.1	4.6	0.3	0.1	0.1	1.7	60.2	21.0	10.1	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.3	115.5	
McLevie	CAN1	0.1	4.7	0.3	0.1	0.2	1.7	59.3	21.8	9.9	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.3	115.8	
MGC	CAG1	0.1	4.4	0.3	0.1	0.1	2.0	61.6	19.5	10.1	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.3	114.3	
MGC	CAN1	0.1	4.1	0.3	0.1	0.1	1.6	63.4	17.6	10.7	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.7	114.2	
Moora	CAN1	0.1	4.6	0.3	0.1	0.1	1.7	59.5	21.4	10.3	0.5	1.0	0.2	<0.1	0.1	0.2	100	7.3	116.3	
Mukinbudin	CAN1	0.1	4.3	0.3	0.1	0.1	1.6	61.6	19.0	10.5	0.5	1.2	0.4	<0.1	0.1	0.2	100	7.2	114.5	
Narrakine	CAN1	0.1	4.0	0.3	0.1	0.1	1.7	63.8	16.9	10.8	0.5	1.2	0.3	<0.1	0.1	0.1	100	6.8	113.7	
Narrakine	CANHK	0.1	4.0	0.3	0.1	0.1	1.7	65.8	15.3	10.3	0.5	1.2	0.3	<0.1	0.1	0.2	100	6.8	111.4	
Nembudding	CAN1	0.1	4.7	0.3	0.1	0.1	1.7	59.4	21.7	10.2	0.5	0.9	0.2	<0.1	0.1	0.2	100	7.4	116.2	
Regans Ford	CAN1	0.1	4.2	0.3	0.1	0.1	1.6	63.8	16.8	10.9	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.9	113.6	
Wagin	CAN1	0.1	4.2	0.3	0.1	0.2	1.8	64.6	16.2	10.2	0.6	1.2	0.4	<0.1	0.1	0.2	100	7.2	111.5	
Wongan Hills	CAG1	0.1	4.5	0.3	0.2	0.1	2.0	62.0	19.1	9.7	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.6	112.9	
York	CAN1	0.1	4.2	0.3	0.1	0.1	1.7	62.2	19.1	10.3	0.5	1.0	0.3	<0.1	0.1	0.2	100	6.9	114.5	
Yoting	CAN1	0.1	4.5	0.3	0.1	0.1	1.7	60.7	20.3	10.2	0.5	1.0	0.3	<0.1	0.1	0.2	100	7.3	115.1	
Kwinana Zone Mean			0.1	4.4	0.3	0.1	0.1	1.8	61.8	19.4	10.2	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.2	114.3
WA Mean			0.1	4.3	0.3	0.1	0.1	1.8	62.0	18.9	10.4	0.5	1.1	0.3	<0.1	0.1	0.1	100	7.1	114.4
WA Min			0.1	3.9	0.3	0.1	0.1	1.6	59.3	14.8	9.4	0.4	0.9	0.2	<0.1	<0.1	0.1	100	6.7	110.7
WA Max			0.1	4.7	0.3	0.2	0.2	2.1	66.5	21.8	11.3	0.6	1.2	0.4	0.1	0.1	0.2	100	7.6	117.5

¹Sat - Sum of the saturated fatty acids including 14:0, 16:0, 17:0, 18:0, 20:0 and 24:0

² Iodine Value - Calculated from the fatty acid composition

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).

The term Juncea Canola is used for mustard (*Brassica juncea*) varieties which have oil and meal quality similar to canola. Fatty acid profiles of the oil and the level of and types of glucosinolates in the meal all meet the quality specifications for canola.

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 μ moles 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 chondrometer and reported as both pounds/bushel and kilograms/hectolitre.



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