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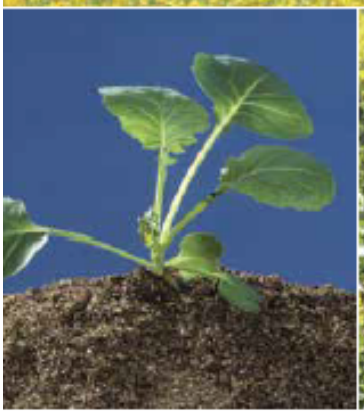
Quality of Australian Canola
2012-13



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AOF Australian Oilseeds Federation

Quality of Australian Canola 2012

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Acknowledgments

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Introduction

Sample Analysis

Canola samples representing the 2012 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 by NIR and 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

Nationally canola set another record in 2012 with an estimated area of 2.395 million hectares. It was the largest crop in the history of the Australian canola industry. Early season prices of around $570/t (port) favoured canola over wheat ($230 APW). Although the area harvested in 2012 was larger than 2011, a lower yield (1.31 t/ha compared to 1.75 t/ha), meant that the national production was slightly lower than the 2011 record harvest at 3,133,000t. Early in 2013, industry sources indicated that production may have been closer to 4 million tonnes when storage, crushing and export volumes were accounted for. Record plantings occurred across all eastern states on the back of the high prices and good subsoil moisture profiles across most of NSW and parts of Victoria.

New South Wales

The 2012 season started with a full profile of subsoil moisture after a second summer of well above average rainfall. Heavy rain in February and March resulted in flooding in the north-west of the state and in the Murrumbidgee and Lachlan valleys.

In many areas little rain fell after mid March, in the lead-up to sowing, therefore, many crops were sown into a seedbed with marginal moisture, but with a full moisture profile underneath. Up to 30% of the crop was sown into dry seedbeds. The resulting establishment started off patchy in early sown crops but rain in late May secured establishment across most areas. Large increases in the area sown with canola occurred mainly in the traditional safer areas of southern and central NSW, but also further west in the low-medium rainfall zone.

In-crop rainfall was highly variable throughout the winter and spring period. Critical rain fell in early-mid July and again in late September in central and southern areas in an otherwise average to significantly below average, winter-spring period. This lack of rainfall reduced opportunities to topdress crops with extra nitrogen and widespread nitrogen deficiency was evident across all winter crop types. A second consecutive season of big crop yields in 2011 and leaching of soil nitrate caused by late summer flooding and waterlogging that occurred prior to sowing all contributes to this nitrogen deficiency. The dry winter coincided with an above average number of frosts which damaged crops in isolated areas, with most impact on crops in central NSW.

Despite the general lack of timely rainfall through winter and spring, spring temperatures were relatively mild. This assisted grain fill and yield potential as well as boosting oil contents, which, despite some variability, fell mostly in the 40-44% range. The dry spring and early summer conditions meant harvest proceeded uninterrupted and finished earlier than normal.

Final estimated production for NSW was a record 960,000 t from an estimated record 670,000 ha, for an average yield of 1.43 t/ha. This compares with the 2011 harvest of 720, 000 t from 390,000 ha for 1.85 t/ha

Victoria

Similar to NSW, Victoria was also primed for a large canola season with good subsoil moisture across many areas, and particularly the north-east where flooding had occurred in March. Other areas still had some subsoil moisture following flooding over the 2010/2011 summer.

An increase in area in the Mallee region was an opportunistic response to poor wheat prices at the time. In this region canola was sown into marginal moisture in late April and early May. Emergence and establishment was patchy, leading to uneven crop growth. The main seasonal break arrived in

late May, but the western Mallee missed this rain. Rainfall was near average in June and July except for the western Mallee which was below average. Rain in July was sufficient for crops to establish and begin accessing subsoil moisture. Similar to N.S.W., rainfall was well below average through spring but was offset by mild temperatures which assisted pod and grain filling.

Harvest commenced early and finished ahead of normal. Yields overall, with the exception of the Mallee, were above expectations. Oil contents were also above expectations considering growing season rainfall was in the Decile 2-3 (bottom 20-30%) range.

Final estimated production for Victoria was 560,000 t from an estimated record area of 430,000 ha, for an average yield of 1.30 t/ha. In 2011 Victoria produced 770,000 t from 370,000 ha for an average yield of 2.08 t/ha

South Australia

An increase in the area sown with canola also occurred in South Australia in 2012. Sowing commenced in early April but dry conditions afterwards resulted in variable establishment and slow early growth. Crops were sown in early May on the Eyre Peninsula and parts of the Yorke Peninsula whilst the rest of the state was sown following the main autumn break in late May.

Rainfall was generally average to below average throughout winter with the last good rain falling in early September. 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 413,000 t from an estimated record area of 295,000 ha, for an average yield of 1.40 t/ha. This compares with the 2011 harvest of 455,000 from 255,000 ha for an average yield of 1.78 t/ha.

Western Australia

Canola area in Western Australia also increased in 2012, again on the price difference between canola and wheat at sowing time. Crops sown in early May in the Northern Agricultural Region on minimal rainfall germinated but then established poorly. Very warm temperatures killed seedlings in patches or over entire paddocks. In other parts of the state crop establishment was generally good.

Rainfall throughout winter was generally average to below average which reduced crop biomass in the central and southern regions. The south coastal and south eastern areas, around Albany and Esperance, experienced above average rainfall from June through to the end of August. Rainfall was generally good in September with some useful falls also in October in southern regions.
As harvest got into full swing, yields were better than expected and higher than industry forecasts. Oil contents were also very good mostly in the 40-45% range.

Final estimated production for Western Australia was a record 1,200,000 t from an estimated 1,000,000 ha, for an average yield of 1.20 t/ha. In 2011 WA produced 1,240,000 t from 800,000 ha for an average yield of 1.55 t/ha.

Pests and Diseases

Canola is subject to a range of pests and diseases on an annual basis. Pest importance has changed over the past decade as cropping rotations have tightened with less pasture in the system. For example, earth mites have declined in importance on many farms. Pest pressure from aphids, heliothis and diamondback moth was generally light, but still warranted control in many localised areas. The dry season overall led to low blackleg disease pressure but almost all sowing seed is treated as a precaution. Despite the dry spring Sclerotinia caused some yield losses in areas that favour the disease.

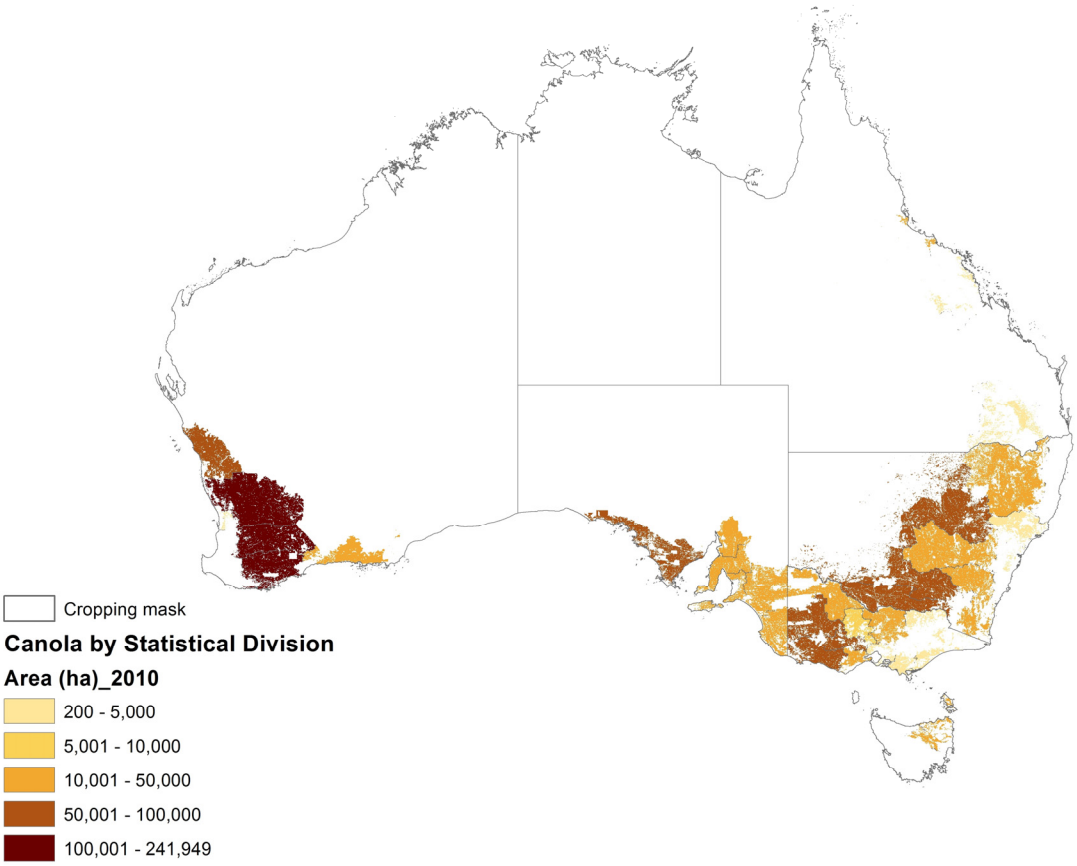

Figure 1: Areas of canola production in Australia
Published with approval of Bureau of Rural Sciences

Yield

The 2012 canola harvest was almost as good as the previous year's record breaker. A massive 2,395,000 hectares were harvested; producing the second largest harvest on record of 3,133,000 tonnes of canola.

The national yield of 1.31 t/ha was 0.45 t/ha less than 2011. The yield varied from a state average of 1.20 t/ha in Western Australia to 1.43 t/ha in New South Wales. Victoria's yield of 1.30 t/ha was the second lowest for the state, only the 0.56 t/ha of 2006 was lower.

Table 1: Canola production in Australia by state 2012

State	Production (kilotonnes)	Area Harvested (kilohectares)	Average Yield (tonnes/hectare)
New South Wales	960	670	1.43
Victoria	560	430	1.30
South Australia	413	295	1.40
Western Australia	1200	1000	1.20
Australia	3133	2395	1.31

Source: AOF Crop Report December 2012

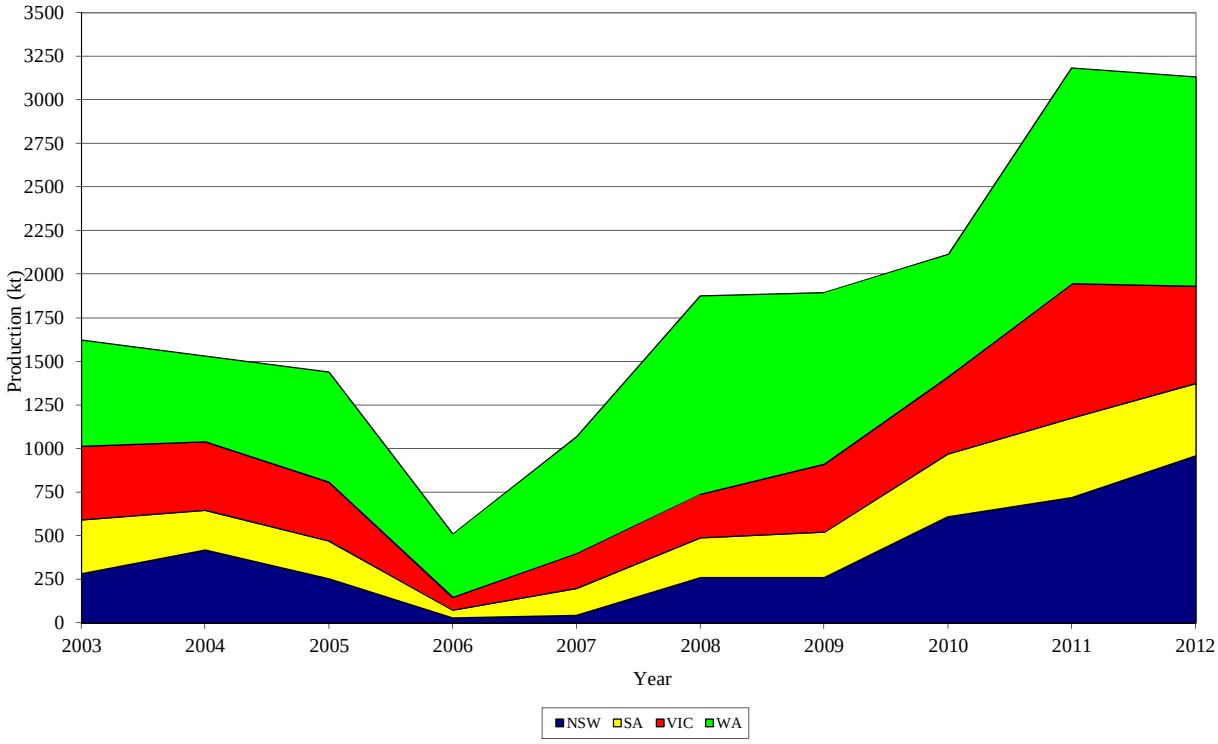

Figure 2: Canola Production in Australia 2003 – 2012

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 tonnage each Site and Grade represents.
This information was not available for Western Australia, so the arithmetic mean instead of the weighted mean is reported.
The Australian mean values were calculated using the sum of the tonnages for each Site and Grade in New South Wales, South Australia and Victoria and the total tonnage for Western Australia.
However, due to tonnages being confidential information, no individual site tonnages can be reported.

Table 2: Average quality of Australian canola 2012

Quality Parameter	Australian Mean
Oil content, % in whole seed @ 6 % moisture	43.4
Protein content, % in oil-free meal @ 10 % moisture	39.3
Glucosinolates, µmoles/g in whole seed @ 6 % moisture	9
Volumetric grain weights, lbs/b	53.6
kg/hL	66.8
Oleic acid concentration (C18:1), % in oil	63.0
Linoleic acid concentration (C18:2), % in oil	18.2
Linolenic acid concentration (C18:3), % in oil	9.8
Erucic acid concentration (C22:1), % in oil	<0.1
Saturated fatty acid concentration, % in oil	7.3
Iodine Value	112.5

Oil Content

The average oil content for the 2012 harvest was 43.4 %. This was a decrease of 0.6 % from the 2011 harvest. Oil content ranged from a low of 37.3 % for the CAN2 grade for the Kwinana Zone in Western Australia to a high of 46.7 % at Hamilton in Victoria.

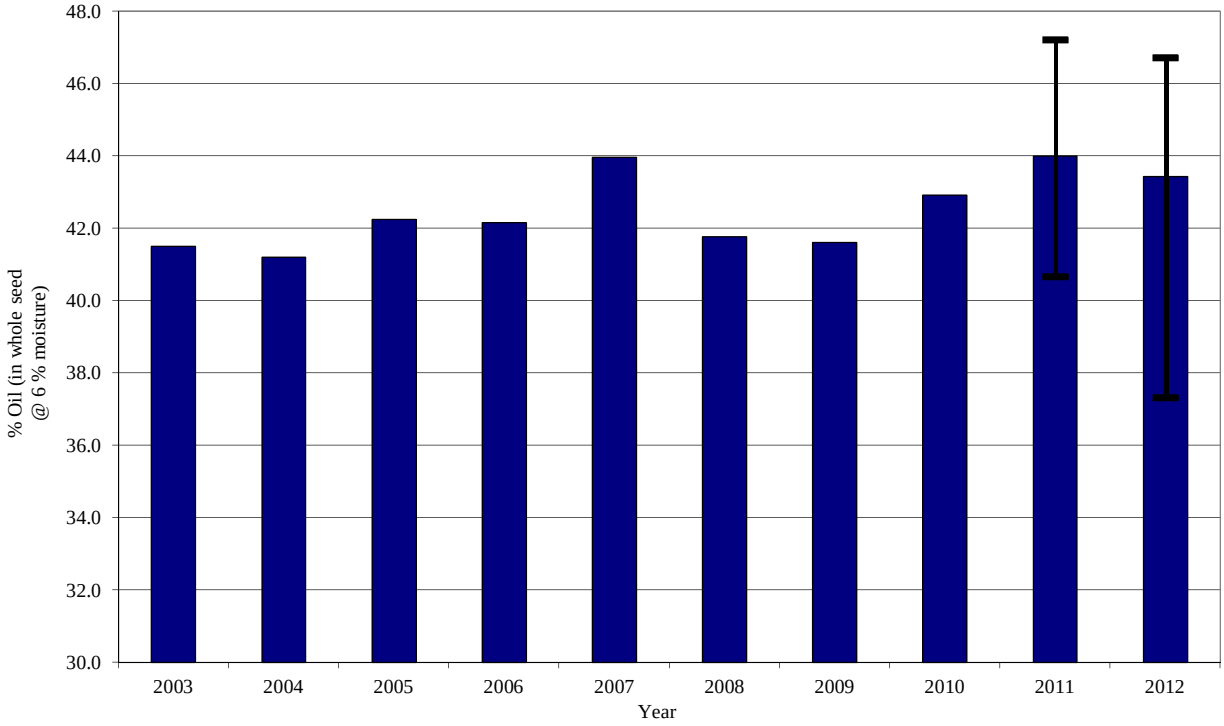

Figure 3: Average Australian oil content 2003 – 2012

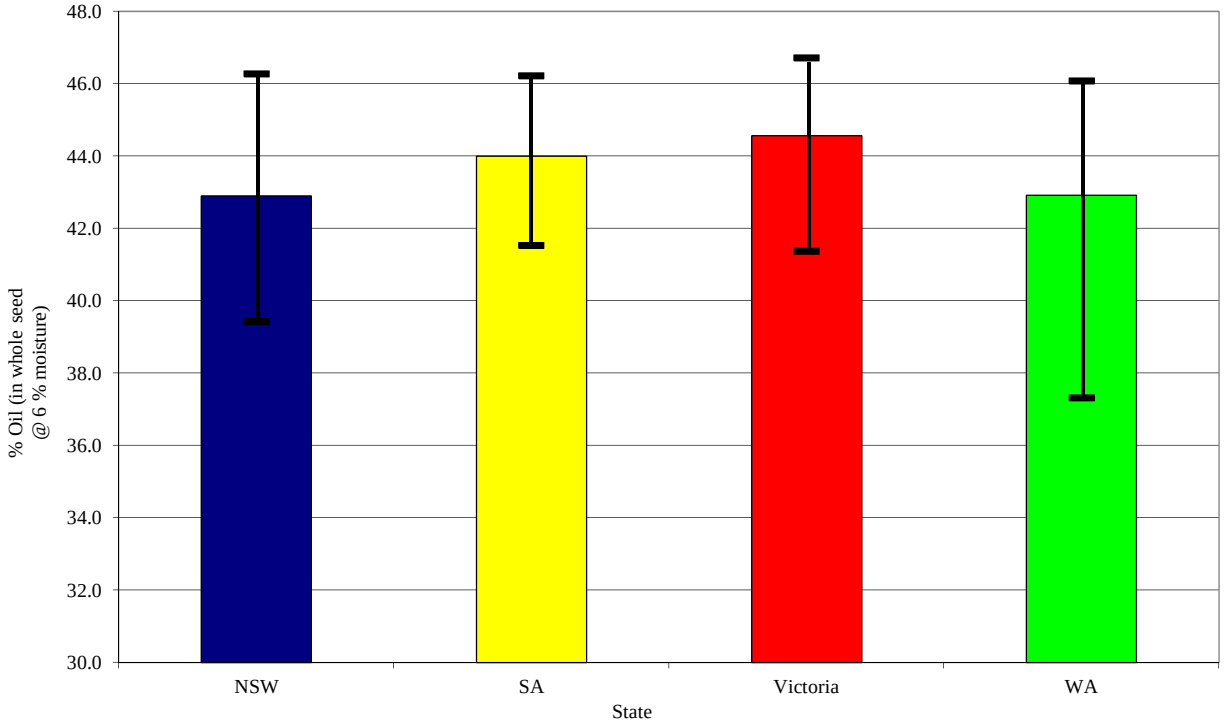

Figure 4: Average oil content by state 2012
Bars show the minimum and maximum for each range

Protein Content

The average protein content for the 2012 harvest was 39.3 % in oil free meal. This was an increase of 1.3 % from the 2011. Protein content ranged from 35.6 % at Yarrawonga in Victoria to 44.5 % at Condobolin in New South Wales.

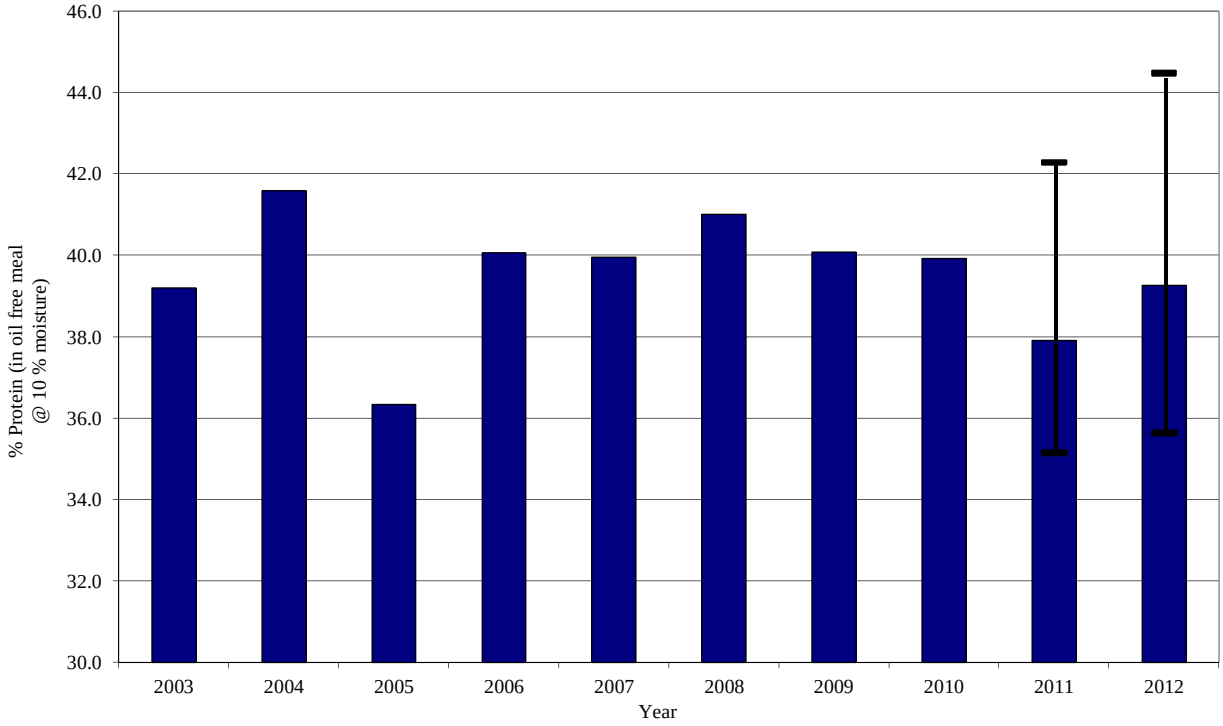

Figure 5: Average Australian protein content 2003 – 2012

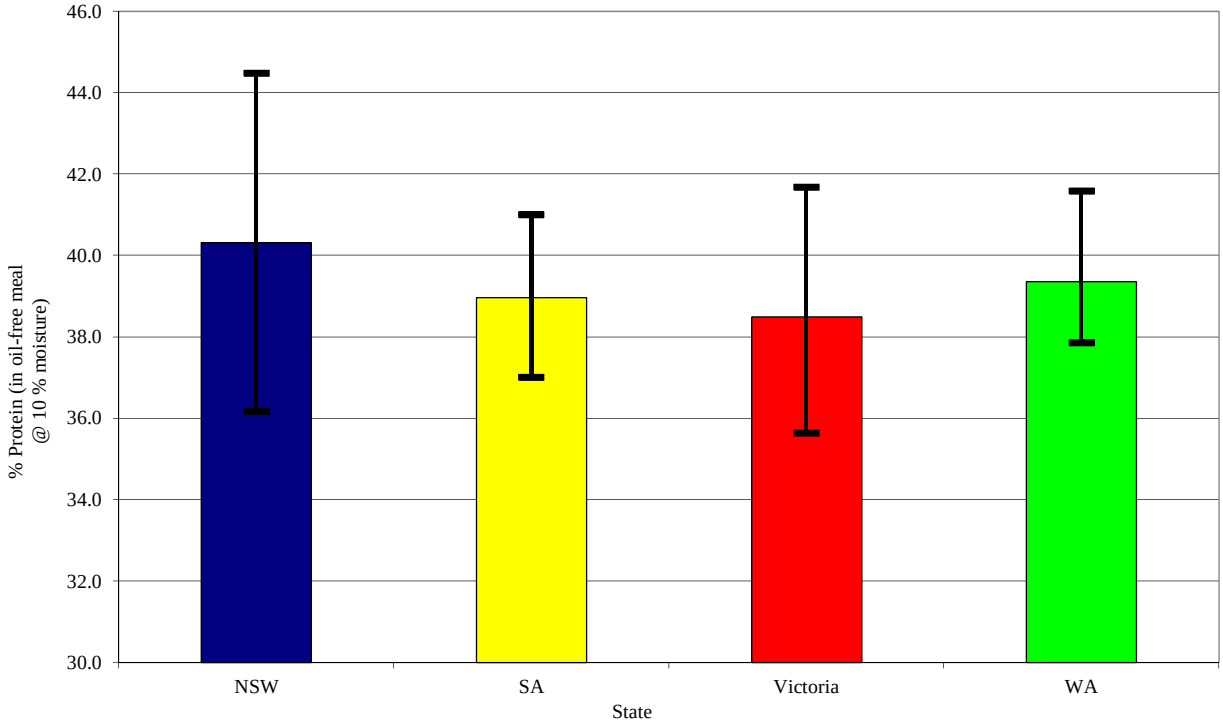

Figure 6: Average protein content by state 2012
Bars show the minimum and maximum for each range

Glucosinolate Concentration

The average glucosinolate content for the 2012 harvest was 9 µmoles/g. This was the same as the 2011 season. Glucosinolate content ranged from 4 µmoles/g at multiple sites to 19 µmoles/g for the CAN2 grade for the Kwinana Zone in Western Australia.

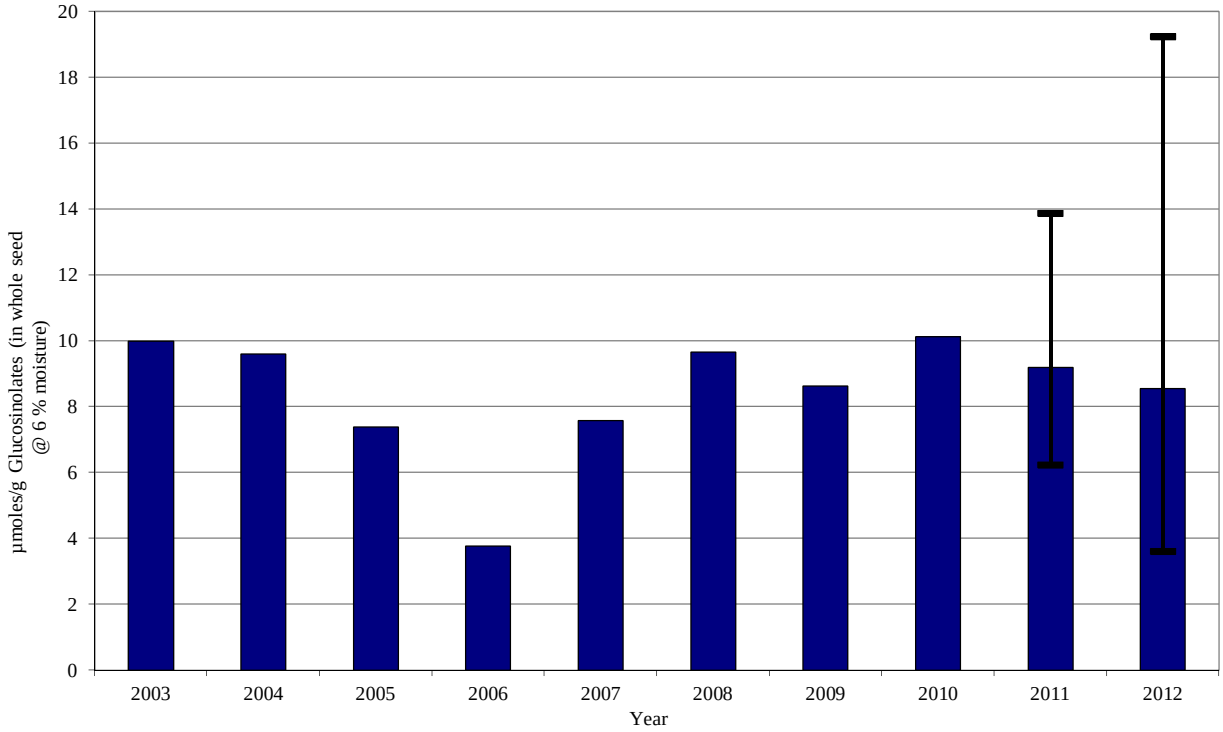

Figure 7: Average Australian glucosinolate content 2003 – 2012

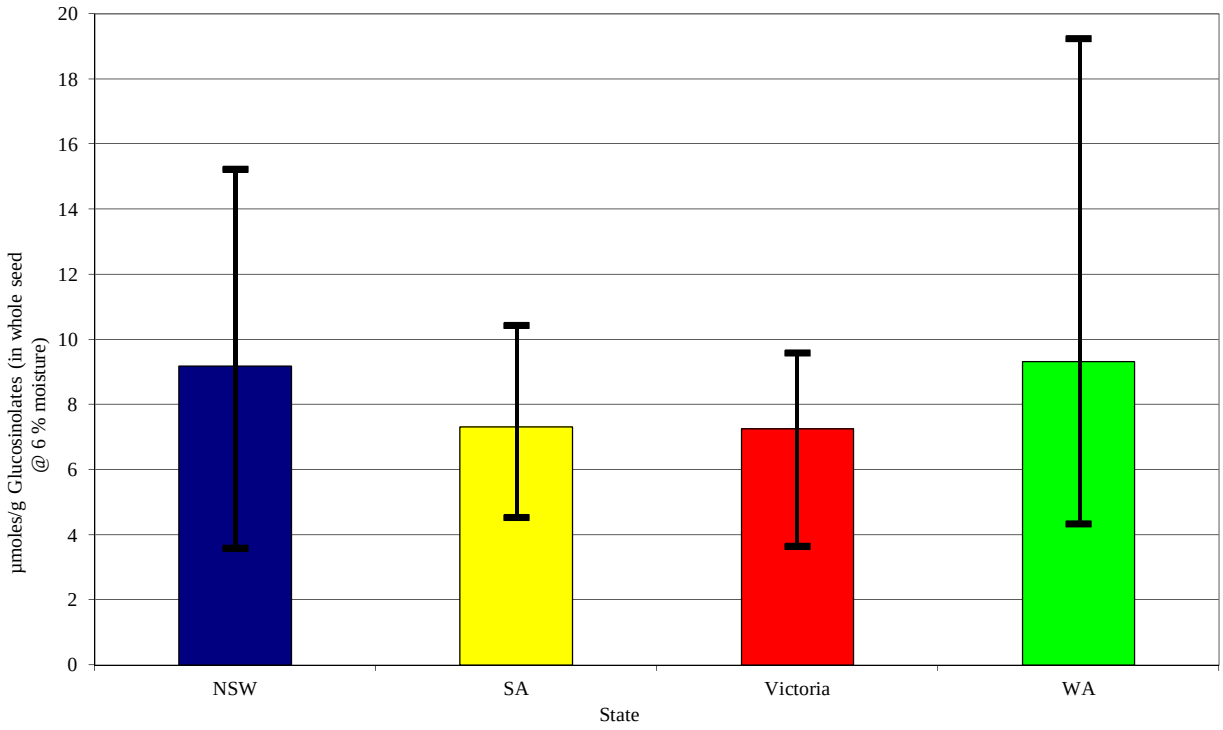

Figure 8: Average glucosinolate content by state 2012
Bars show the minimum and maximum for each range

Fatty Acid Composition

Oleic Acid

The average oleic acid (C18:1) concentration in the oil produced from the 2012 harvest was 63.0 %. This was 1.2 % higher than 2011 and the highest recorded since the inception of this book. The oleic concentration ranged from 58.8 % for the CAN2 grade for the Kwinana Zone in Western Australia to 74.5 % at Back Creek in New South Wales.

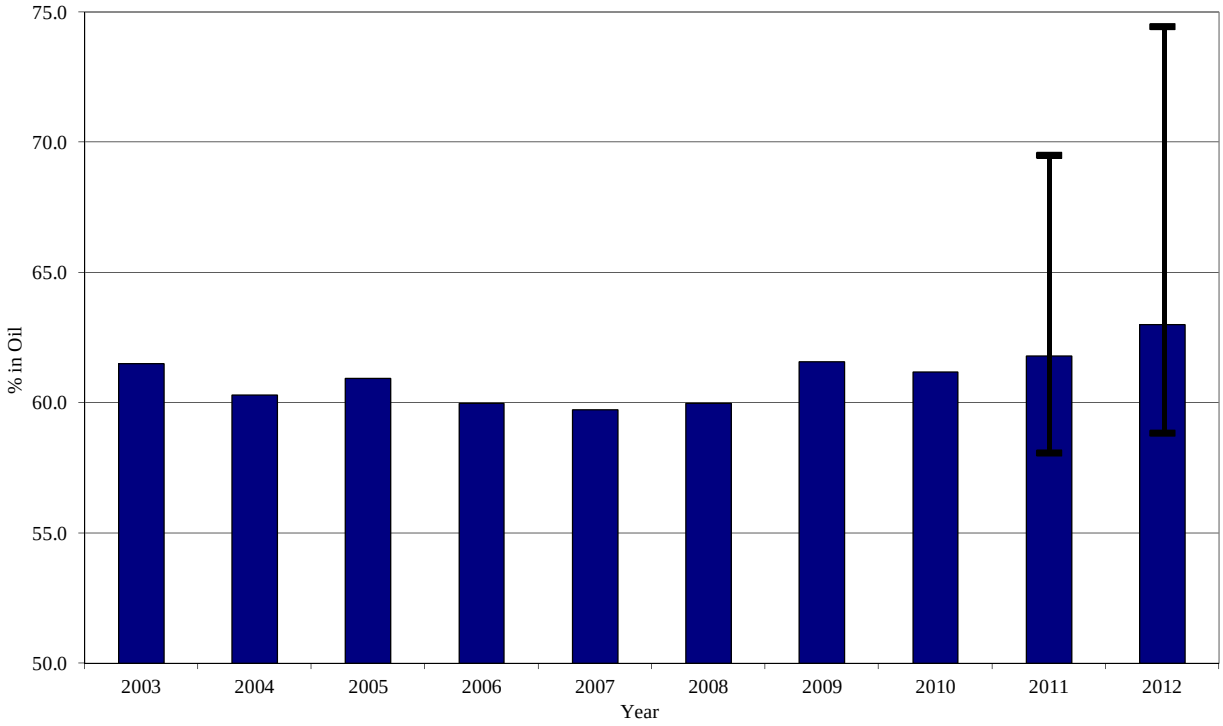

Figure 9: Average Australian oleic acid concentration in canola oil 2003 – 2012

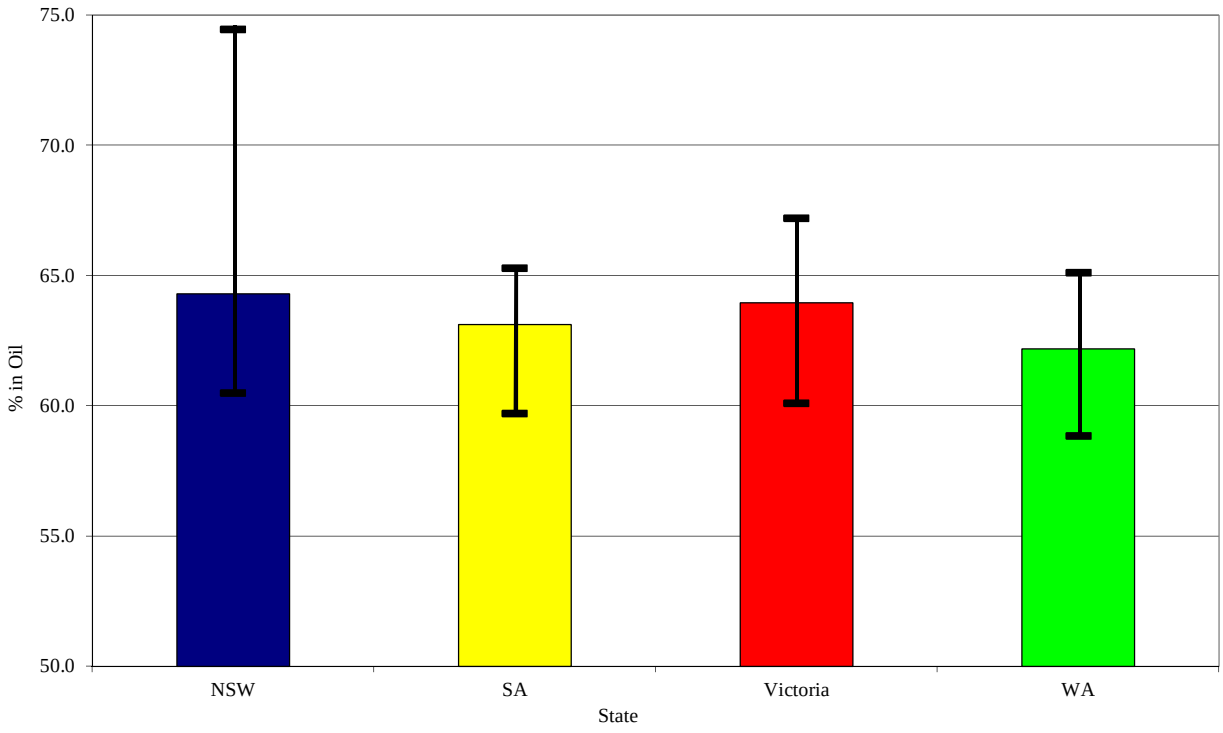

Figure 10: Average oleic acid concentration by state 2012
Bars show the minimum and maximum for each range

Linoleic Acid

The average linoleic acid (C18:2) concentration in oil produced from the 2012 harvest was 18.2 %. This was 0.5 % lower than 2011 and the lowest in the eighteen year history of this book. The concentration ranged from 13.8 % at Back Creek in New South Wales to 21.0 % at Parkes Sub in New South Wales.

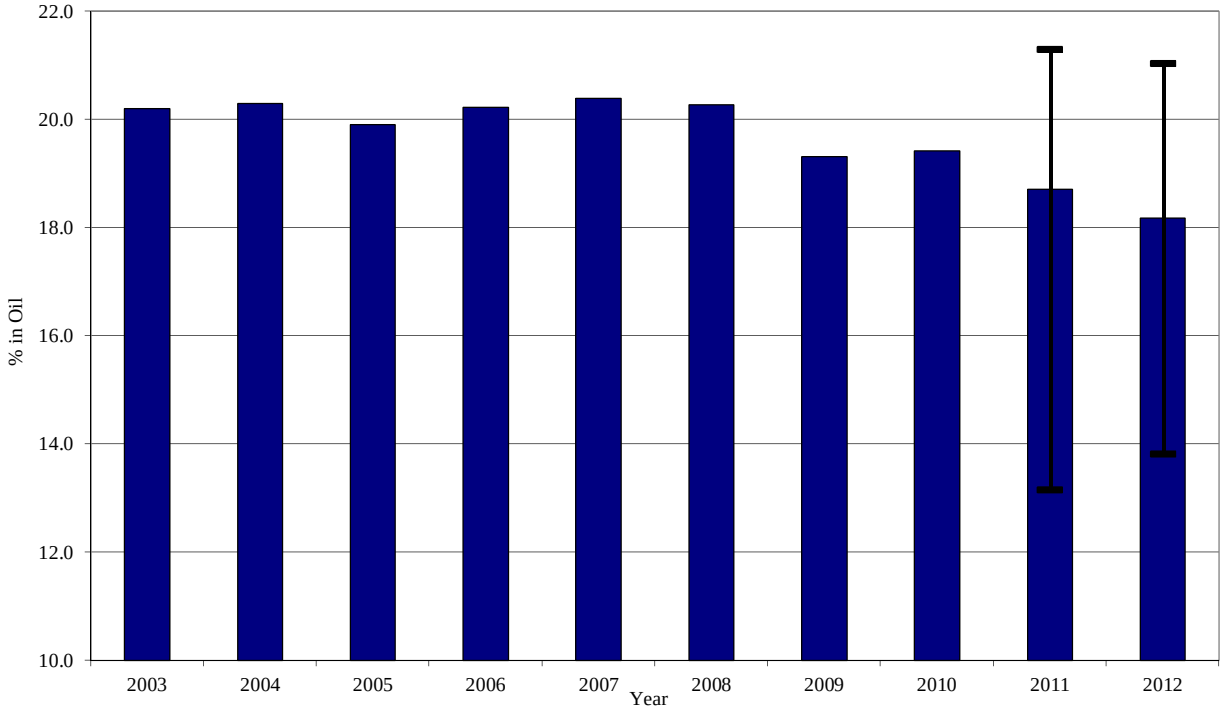

Figure 11: Average Australian linoleic acid concentration in canola oil 2003 – 2012

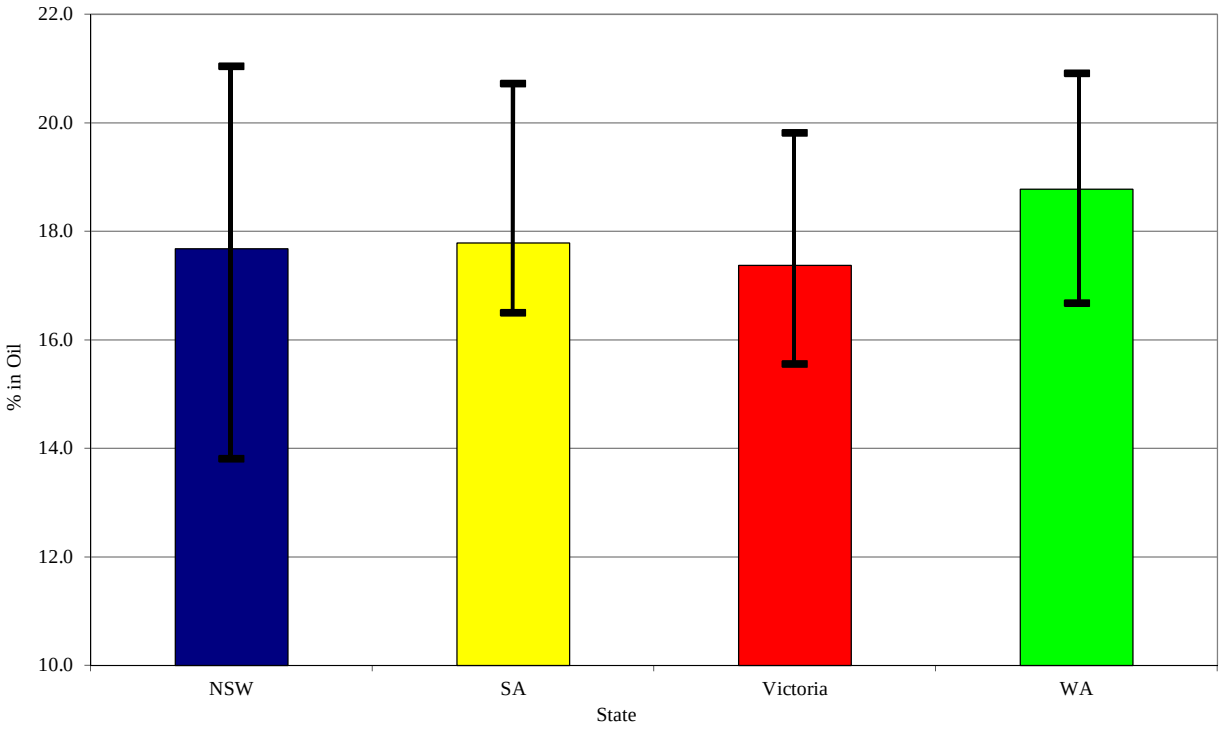

Figure 12: Average linoleic acid concentration by state 2012
Bars show the minimum and maximum for each range

Linolenic Acid

The linolenic acid (C18:3) concentration for 2012 was 9.8 % this was 0.6 % lower than the 2011 harvest. Linolenic acid concentrations ranged from 2.9 % at multiple sites in New South Wales to 11.2 % at Parilla in South Australia for the second year in a row.

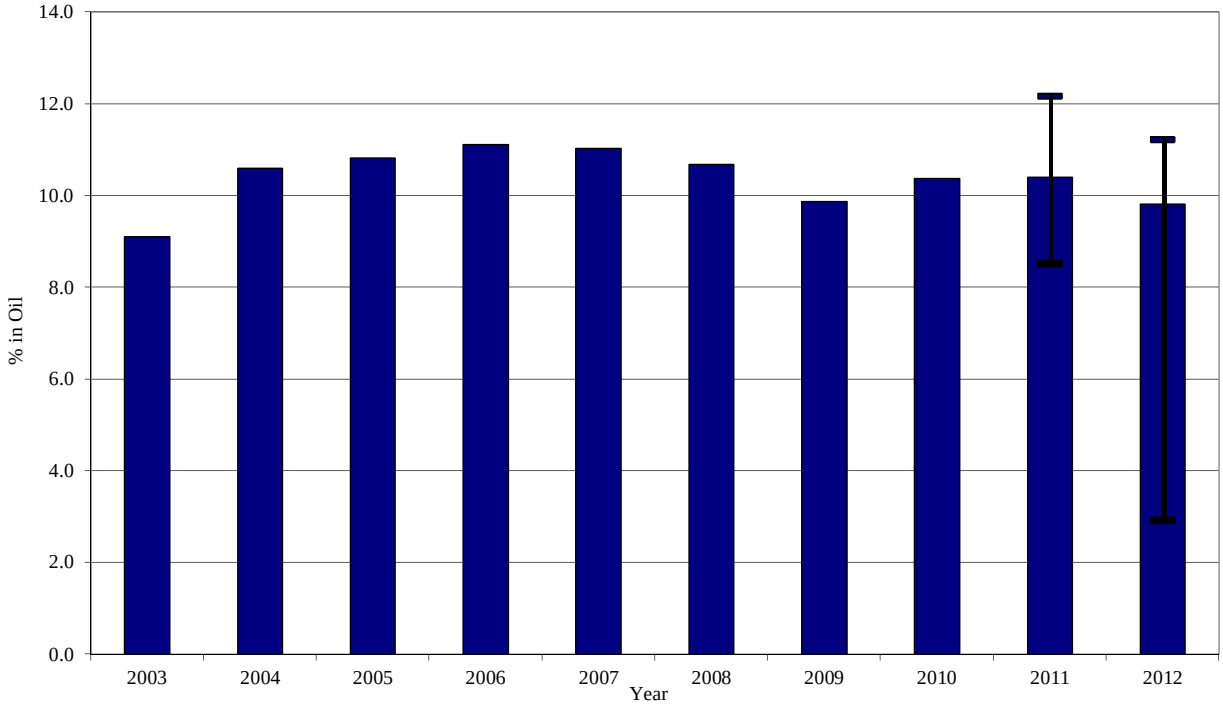

Figure 13: Average Australian linolenic concentration in canola oil 2003 – 2012

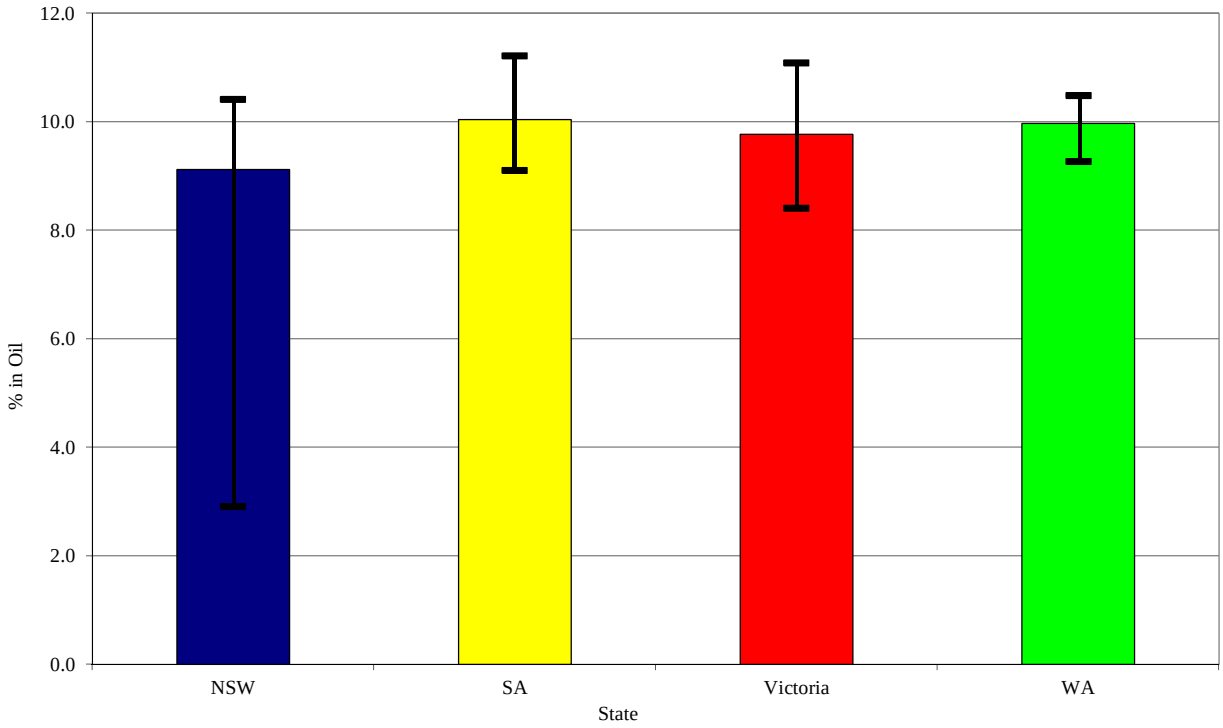

Figure 14: Average linolenic acid concentration by state 2012
Bars show the minimum and maximum for each range

Saturated Fatty Acid

The average saturated fatty acid concentration for the 2012 harvest was 7.3 %. This was a 0.1 % increase from the 2011 harvest. Saturated fatty acid concentration ranged from 6.6 % at Condobolin in New South Wales to 7.9 % at Caroona in New South Wales and the CAG2 grade in the Esperance Zone in Western Australia.

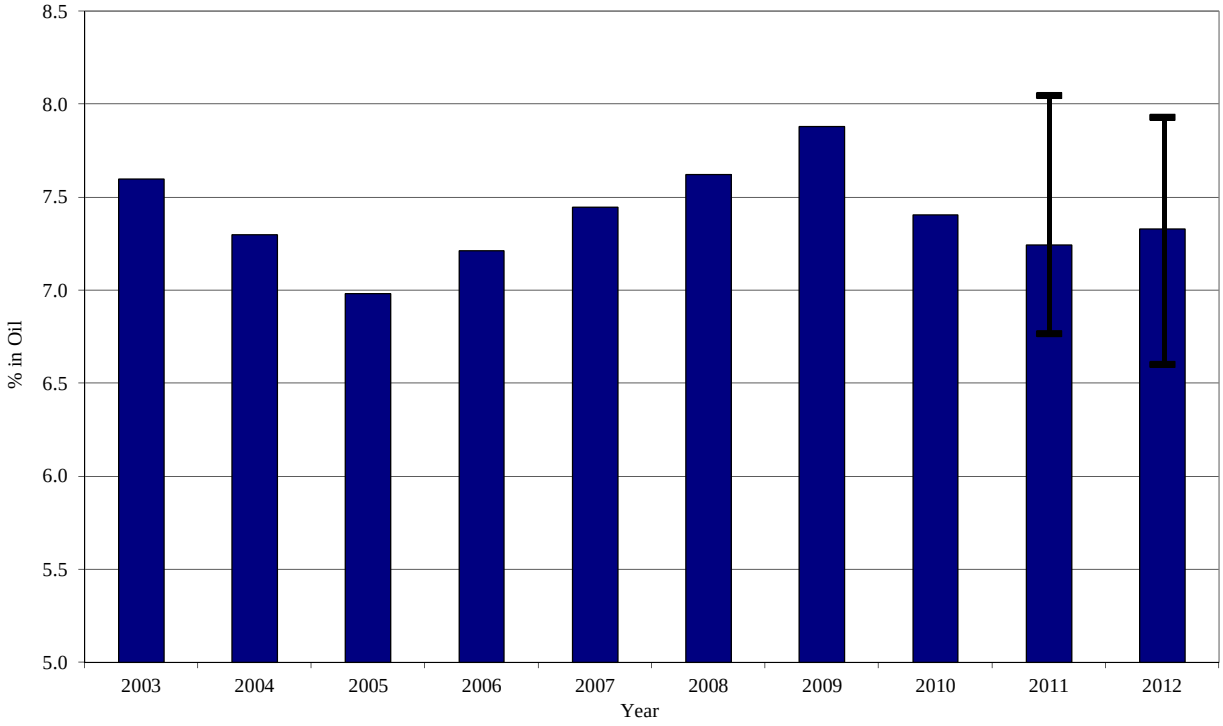

Figure 15: Average Australian saturated fatty acid concentration in canola oil 2003 – 2012

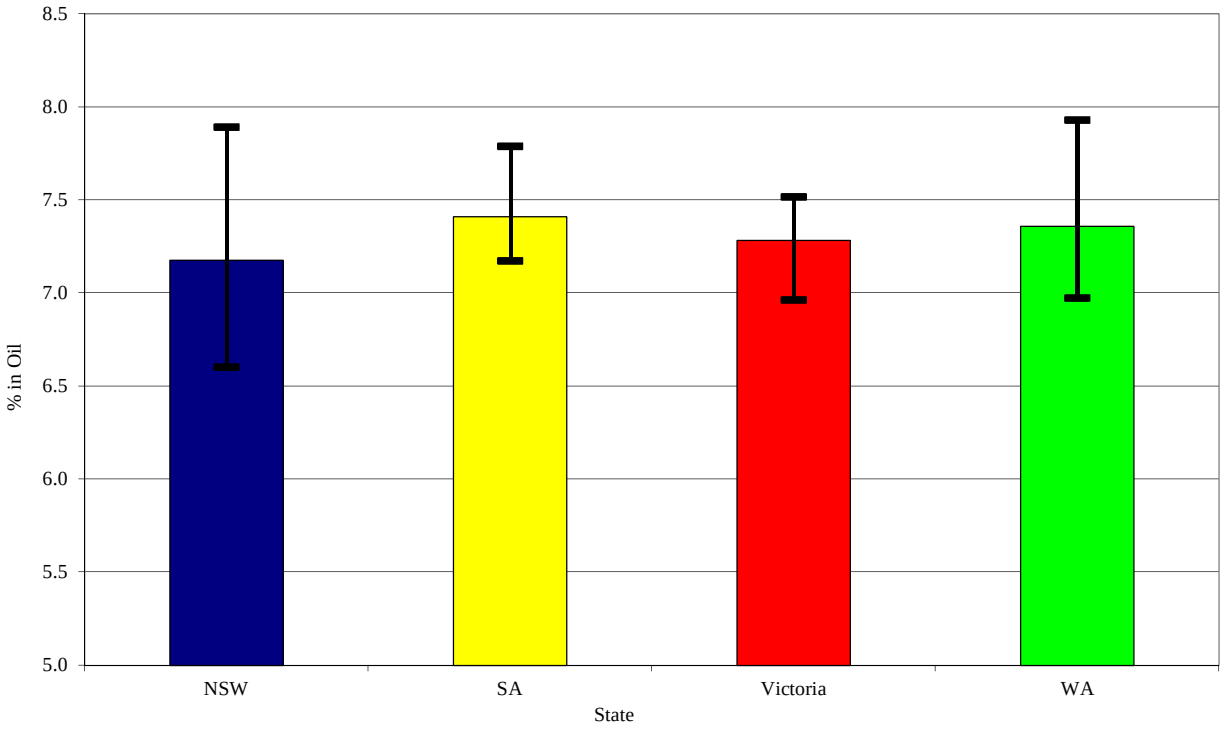

Figure 16: Average saturated fatty acid concentration by state 2012
Bars show the minimum and maximum for each range

Iodine Value

The average iodine value for the 2012 harvest was 112.5. This is the lowest since 2004. Iodine value ranged from 96.8 in Back Creek in New South Wales to 116.3 in Parilla in South Australia.

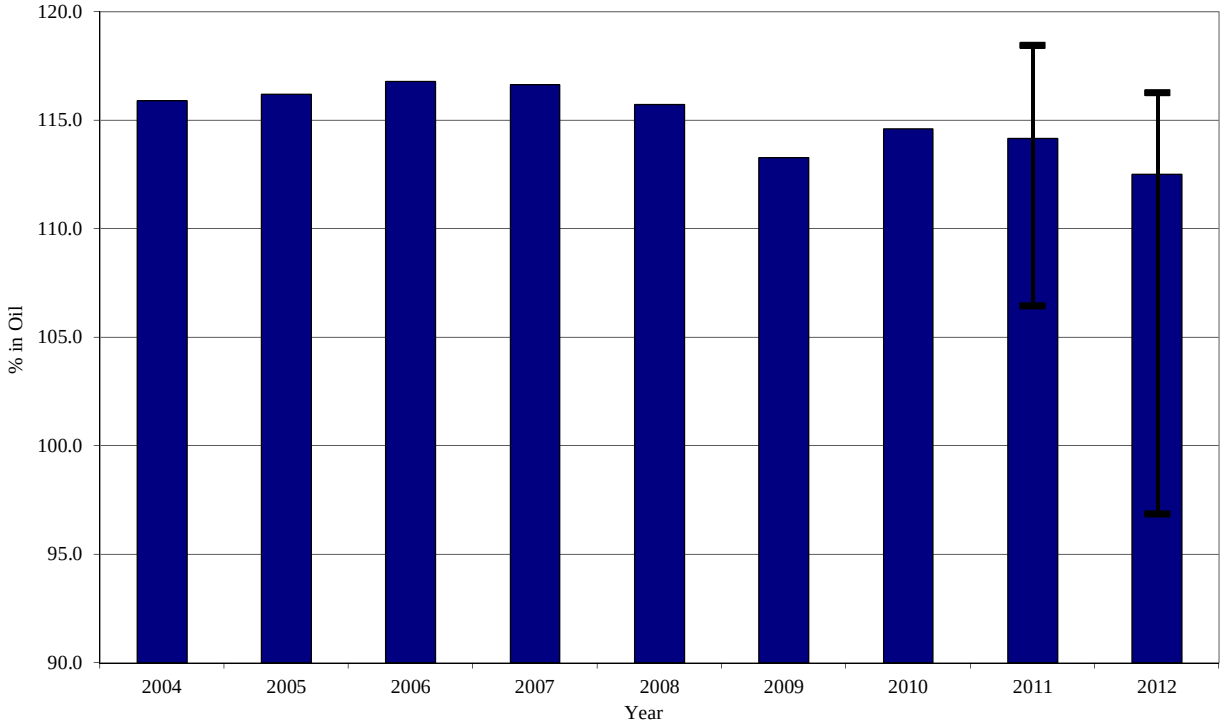

Figure 17: Average Australian iodine value in canola oil 2004 – 2012

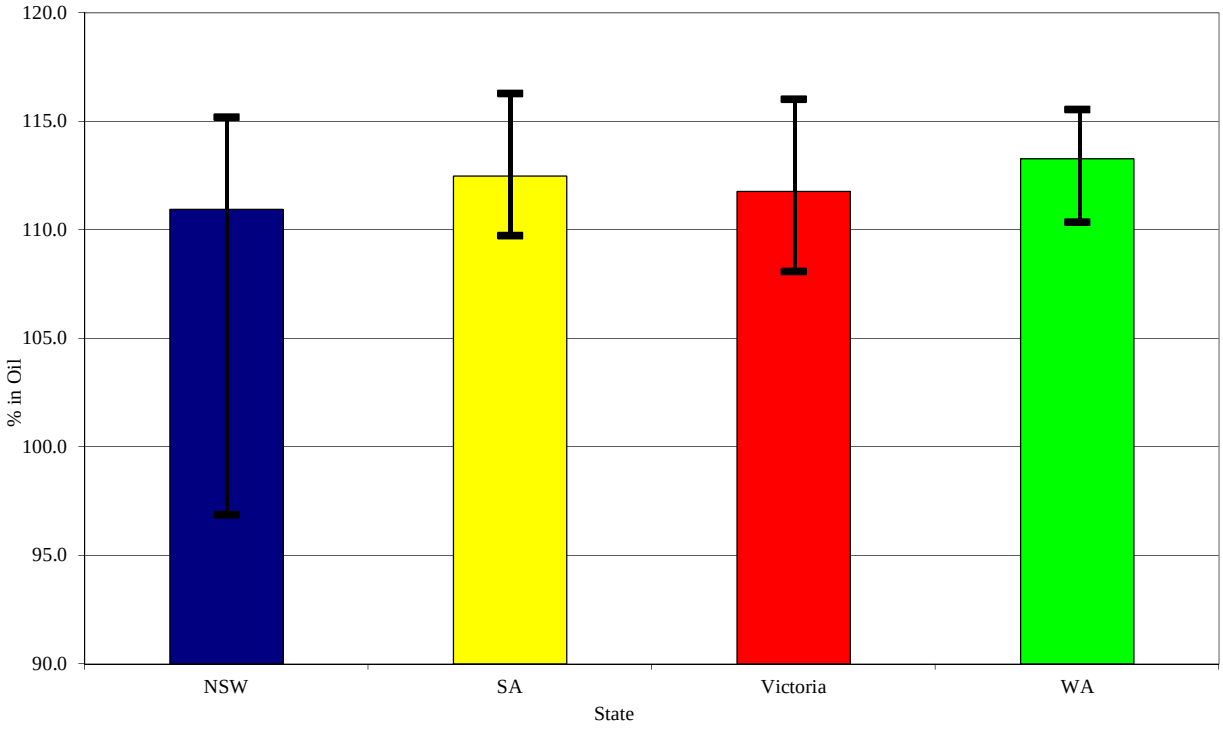

Figure 18: Average iodine value by state 2012
Bars show the minimum and maximum for each range

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-Haddads	CAN	41.4	40.9	9	53.2	66.3
Werris Creek						
Caroona	CAN	40.8	41.9	10	53.9	67.1
Neilrex	CAN	43.3	41.0	11	52.8	65.8
Premer	CAN	42.0	40.4	9	53.4	66.5
Quirindi	CAN	41.9	40.2	10	53.7	66.9
Ulamambri	CAN	43.0	40.7	7	53.6	66.8
Northern Mean		**41.7**	**40.8**	**9**	**53.3**	**66.4**
Central NSW						
Dubbo						
Armatree	CAN	42.0	42.4	8	55.1	68.6
Coonamble	CAN	39.4	43.6	9	54.6	68.0
Curban	CAN	42.6	40.3	9	53.4	66.5
Gilgandra	CAN	43.2	40.9	11	53.7	66.9
Manildra	CAMM	43.7	41.7	11	52.9	65.9
Manildra	CAN	43.9	41.0	10	53.1	66.1
Mungeribar	CANG	44.6	42.6	9	53.0	66.0
Mungeribar	CANG	43.8	42.8	8	52.8	65.8
Muronbung	CNH1	39.4	43.5	15	52.8	65.8
Narwonah	CAN	42.6	42.6	14	54.0	67.3
Nevertire	CAN	41.6	42.4	10	54.0	67.3
Nyngan	CAN	39.7	43.3	13	54.1	67.4
Wongarbon	CAN	43.2	39.9	9	52.4	65.4
Parkes						
Back Creek	CGH1	46.3	39.0	10	50.8	63.4
Bogan Gate	CAN	41.8	40.6	12	53.6	66.8
Bribbaree	CAN	44.1	38.5	7	53.6	66.8
Canowindra	CAN	43.4	39.4	8	52.7	65.6
Caragabal	CAN	43.5	38.0	9	53.4	66.5
Condobolin	CAMM	41.5	44.5	7	52.8	65.8
Condobolin	CAN	41.6	42.3	8	53.9	67.1
Cowra	CAN	44.1	37.6	9	53.0	66.0
Greenethorpe	CAN	44.4	37.8	9	53.1	66.1
Kadungle	CAMM	43.9	41.9	9	52.0	64.9
Kadungle	CAN	43.5	41.5	11	53.7	66.9
Koorawatha	CAN	43.3	39.9	10	53.7	66.9
Milvale	CAN	45.6	38.4	8	53.0	66.0
Parkes Sub	CAMM	40.7	41.9	11	51.9	64.8
Parkes Sub	CAN	42.5	39.5	10	53.7	66.9
Parkes Sub	CANG	44.4	39.6	6	53.4	66.5
Red Bend	CAN	42.5	39.5	11	53.3	66.4
Weedallion	CAN	45.0	37.0	9	53.0	66.0
Wirrinya	CAN	43.5	38.6	7	53.4	66.5
Central Mean		**43.1**	**40.3**	**9**	**53.4**	**66.6**
Southern NSW						
Griffith						
Barellan	CAN	43.2	40.8	9	52.9	65.9
Coleambaly	CAN	43.4	39.5	7	53.5	66.7
Merriwagga	CAN	40.0	40.3	12	52.7	65.6
Narrandra	CAN	44.9	39.2	5	53.2	66.3
Rankin Springs	CAN	41.9	40.4	9	54.5	67.9
Tabbita	CAN	43.5	38.5	7	53.2	66.3

[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						
Boorowa	CAN	45.1	37.7	9	53.2	66.3
Boree Creek	CAN	42.2	40.3	9	54.0	67.3
Coolamon	CAN	44.4	39.7	5	52.7	65.6
Cootamundra	CAN	45.3	37.7	9	54.1	67.4
Cunningar	CAN	44.8	38.5	9	54.7	68.2
Harden	CAN	44.5	37.3	9	53.3	66.4
Henty West	CAN	45.6	36.2	6	54.4	67.8
Illabo	CAN	43.7	38.1	11	54.2	67.6
Junee	CAN	44.9	38.5	7	53.6	66.8
Lockhart	CANG	44.5	38.0	5	51.4	64.1
Matong	CAN	41.1	41.1	14	54.2	67.5
Milbrulong	CAN	45.7	38.0	7	52.6	65.5
Pleasant Hills	CAN	44.5	38.1	7	53.4	66.6
Rand	CAN	43.8	39.3	9	53.8	67.1
Yerong Creek	CAN	45.0	38.0	11	54.0	67.3
Yuluma	CAN	42.8	41.0	4	53.5	66.6
West Wyalong						
Stockinbingal	CANG	44.4	40.2	7	53.1	66.1
West Wyalong						
Ardlethan	CAN	44.3	42.6	12	54.3	67.7
Maimuru	CAN	44.2	38.4	9	54.0	67.3
Temora	CAN	44.3	39.0	10	52.8	65.8
Wyalong	CAN	44.5	40.4	9	52.8	65.8
Southern Mean		**44.1**	**39.1**	**8**	**53.4**	**66.5**
NSW Mean		**42.9**	**40.3**	**9**	**53.4**	**66.5**
NSW Min		*39.4*	*36.2*	*4*	*50.8*	*63.4*
NSW Max		*46.3*	*44.5*	*15*	*55.1*	*68.6*

[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 4: Quality Data – South Australia

Port/ Zone/ Receival Site	Grade	[1] Oil	[2] Protein	[3] Glucosinolates µmoles/g	[4] Grain Weight lbs/b	kg/hL
Port Adelaide						
Adelaide Area						
Pt Adelaide	CANO	42.3	39.8	5	54.8	68.3
Murray Mallee						
Parilla	CANO	42.4	40.9	7	54.6	68.0
Northern Area						
Andrews	CANO	42.3	40.1	10	53.5	66.6
Bowmans	CANO	42.8	39.9	6	53.8	67.0
Caltowie	CANO	41.5	41.0	10	53.8	67.0
Roseworthy	CANO	42.2	40.7	9	53.6	66.8
South East						
Frances	CANO	44.8	37.2	7	54.1	67.4
Keith	CANO	42.6	38.8	8	53.8	67.0
Millicent	CANO	44.0	38.4	5	53.1	66.1
Tailem Bend	CANO	44.0	38.4	7	53.6	66.8
Wolseley	CANO	43.4	39.0	9	53.4	66.5
Port Adelaide Mean		**43.0**	**39.4**	**8**	**53.7**	**66.9**
Port Giles						
Yorke Peninsula						
Ardrossan	CANO	44.4	38.5	7	53.1	66.1
Port Giles Mean		**44.4**	**38.5**	**7**	**53.1**	**66.1**
Port Lincoln						
Eyre Peninsula						
Cummins	CANO	46.2	38.1	6	53.8	67.0
Pt Lincoln	CANO	45.1	38.7	7	53.0	66.0
Rudall	CANO	42.7	39.7	6	54.2	67.5
Ungarra	CANO	43.9	37.0	8	54.4	67.8
Yeelanna	CANO	43.9	38.7	10	53.6	66.8
Port Lincoln Mean		**45.4**	**38.4**	**7**	**53.5**	**66.7**
SA Mean		**44.0**	**39.0**	**7**	**53.6**	**66.8**
SA Min		*41.5*	*37.0*	*5*	*53.0*	*66.0*
SA Max		*46.2*	*41.0*	*10*	*54.8*	*68.3*

[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						
Murtoa	CAN	43.7	40.3	10	52.9	65.9
Natimuk	CAN	42.6	39.1	9	52.3	65.3
Warracknabeal	CAN	41.4	41.7	7	54.1	67.4
Ouyen						
Beulah	CAN	43.2	41.1	6	53.0	66.0
Rainbow	CAN	43.0	40.3	7	54.5	67.9
Swan Hill						
Quambatook	CAN	43.6	37.9	4	53.5	66.6
North West Mean		**43.1**	**40.0**	**8**	**53.0**	**66.1**
South East Vic						
Marong East						
Barnes Crossing	CAN	43.8	38.9	8	52.1	65.0
Dookie	CAN	44.3	38.3	9	52.9	65.9
Elmore	CAN	45.7	37.6	5	52.4	65.4
Oaklands	CAN	42.9	39.5	9	53.7	66.9
Yarrawonga	CAN	46.3	35.6	8	52.4	65.4
Marong South						
Berrybank	CAN	44.9	37.3	9	52.1	65.0
Boort	CAN	44.7	37.9	6	53.8	67.0
Donald	CAN	43.0	39.9	6	54.5	67.9
Dunolly	CAN	45.4	37.7	6	51.6	64.4
Hamilton	CAN	46.7	37.4	6	52.0	64.9
Westmere	CAN	45.7	39.0	6	53.4	66.5
Willaura	CAN	46.4	37.0	4	51.7	64.5
South East Mean		**45.2**	**37.8**	**7**	**52.7**	**65.7**
Victoria Mean		**44.6**	**38.5**	**7**	**52.8**	**65.8**
Victoria Min		*41.4*	*35.6*	*4*	*51.6*	*64.4*
Victoria Max		*46.7*	*41.7*	*10*	*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	Grade	[1] Oil	[2] Protein	[3] Glucosinolates µmoles/g	[4] Grain Weight lbs/b	kg/hL
Albany						
Albany	CAG1	45.2	38.9	7	54.0	67.3
Albany	CAN1	42.6	38.8	10	54.3	67.7
Albany	CAN1&2	42.4	37.9	10	54.5	67.9
Albany	CAN2	42.3	38.3	11	54.3	67.7
Albany Zone Mean		**43.1**	**38.5**	**10**	**54.3**	**67.6**
Esperance						
Esperance	CAG1	46.1	38.4	4	53.7	66.9
Esperance	CAG2	43.8	39.3	7	54.6	68.0
Esperance	CAN1	43.0	38.9	10	54.0	67.3
Esperance Zone Mean		**44.3**	**38.9**	**7**	**54.1**	**67.4**
Geraldton						
Geraldton	CAG1	44.6	39.3	4	54.0	67.3
Geraldton	CAN1	43.7	41.1	9	53.6	66.8
Geraldton	CAN2	43.3	40.6	10	52.8	65.8
Geraldton Zone Mean		**43.9**	**40.3**	**8**	**53.4**	**66.6**
Kwinana						
Kwinana	CAG1	43.6	38.7	6	53.9	67.1
Kwinana	CAN1	42.3	40.0	10	54.0	67.3
Kwinana	CAN1&2	42.7	39.1	8	53.8	67.0
Kwinana	CAN2	37.3	41.6	19	54.3	67.6
Kwinana Zone Mean		**41.5**	**39.9**	**11**	**54.0**	**67.3**
York						
York	CAN1	40.9	39.5	13	54.4	67.8
York Zone Mean		**40.9**	**39.5**	**13**	**54.4**	**67.8**
WA Mean		**42.9**	**39.4**	**9**	**54.0**	**67.3**
WA Min		*37.3*	*37.9*	*4*	*52.8*	*65.8*
WA Max		*46.1*	*41.6*	*19*	*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

Fatty Acid Composition by State

Table 7: Fatty Acid Composition – New South Wales

Region/ 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
Northern NSW																			
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																			
Caroona	CAN	0.1	4.3	0.3	0.2	0.2	2.4	61.4	19.4	9.7	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.9	112.8
Neilrex	CAN	0.1	4.1	0.3	0.2	0.1	2.2	62.3	18.9	9.9	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	113.2
Premer	CAN	0.1	4.1	0.3	0.2	0.1	2.2	62.1	19.0	9.7	0.5	1.0	0.2	0.1	0.1	0.1	100	7.4	112.9
Quirindi	CAN	0.1	4.1	0.3	0.2	0.2	2.3	63.3	18.0	9.7	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	112.1
Ulamambri	CAN	0.1	4.3	0.3	0.1	0.1	1.8	62.4	19.5	9.4	0.5	1.1	0.2	0.1	0.1	0.1	100	7.0	113.2
Northern NSW Mean		**0.1**	**4.0**	**0.3**	**0.2**	**0.2**	**2.2**	**64.0**	**17.7**	**9.5**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**100**	**7.3**	**111.6**
Central NSW																			
Dubbo																			
Armatree	CAN	0.1	4.1	0.3	0.2	0.2	2.2	62.9	18.4	9.6	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	112.3
Coonamble	CAN	0.1	4.1	0.3	0.2	0.2	2.0	62.3	19.1	9.7	0.4	1.1	0.2	0.1	0.1	0.2	100	7.1	113.2
Curban	CAN	0.1	4.2	0.3	0.2	0.1	2.1	62.9	18.0	10.1	0.5	1.0	0.2	<0.1	0.1	0.2	100	7.3	112.9
Gilgandra	CAN	0.1	4.3	0.3	0.2	0.1	1.9	61.8	19.9	9.5	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.2	113.6
Manildra	CAMM	<0.1	3.7	0.3	0.1	0.1	2.4	68.1	20.2	2.9	0.6	1.1	0.2	<0.1	0.2	0.2	100	7.2	102.3
Manildra	CAN	0.1	4.1	0.3	0.2	0.1	2.0	63.8	18.1	9.2	0.5	1.1	0.2	0.1	0.1	0.2	100	7.2	111.4
Mungeribar	CANG	0.1	4.1	0.3	0.2	0.1	2.0	62.5	18.7	9.9	0.5	1.1	0.2	0.1	0.1	0.2	100	7.2	113.2
Mungeribar	CANG	0.1	4.4	0.3	0.2	0.1	2.1	61.7	19.3	10.2	0.4	1.0	0.2	<0.1	0.1	0.1	100	7.4	114.2
Muronbung	CNH1	0.1	4.2	0.3	0.2	0.1	2.0	68.3	18.4	3.6	0.7	1.4	0.3	0.1	0.2	0.3	100	7.6	101.4
Narwonah	CAN	0.1	4.3	0.3	0.2	0.1	2.0	61.4	19.1	10.4	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.3	114.3
Nevertire	CAN	0.1	4.2	0.3	0.2	0.2	2.0	61.5	19.6	9.9	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.2	113.8
Nyngan	CAN	0.1	4.0	0.3	0.2	0.1	1.9	61.4	19.8	9.8	0.5	1.2	0.2	<0.1	0.1	0.3	100	7.1	114.0
Wongarbon	CAN	0.1	4.1	0.3	0.2	0.2	2.1	63.4	18.2	9.5	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.2	112.0
Parkes																			
Back Creek	CGH1	0.1	3.8	0.3	0.2	0.1	2.0	74.5	13.8	2.9	0.6	1.2	0.3	<0.1	0.1	0.1	100	7.1	96.8
Bogan Gate	CAN	0.1	4.1	0.3	0.1	0.1	1.8	65.6	16.4	9.1	0.6	1.2	0.3	<0.1	0.1	0.2	100	7.2	109.8
Bribbaree	CAN	0.1	4.0	0.3	0.1	0.1	1.8	66.6	16.0	8.8	0.5	1.1	0.3	<0.1	0.1	0.2	100	6.9	109.1
Canowindra	CAN	0.1	4.2	0.3	0.2	0.1	1.9	65.1	16.9	8.8	0.6	1.2	0.3	0.1	0.1	0.2	100	7.3	109.5
Caragabal	CAN	0.1	4.1	0.3	0.1	0.1	1.8	65.7	16.4	9.1	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.1	109.9
Condobolin	CAMM	0.1	3.5	0.3	0.1	0.1	2.0	69.0	19.8	2.9	0.5	1.1	0.2	<0.1	0.1	0.2	100	6.6	102.5
Condobolin	CAN	0.1	4.3	0.3	0.2	0.1	2.1	62.0	18.8	10.1	0.5	1.1	0.2	<0.1	0.1	0.1	100	7.4	113.4
Cowra	CAN	0.1	4.0	0.3	0.1	0.1	1.9	66.3	16.0	8.9	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.0	109.3
Greenethorpe	CAN	0.1	4.1	0.3	0.2	0.1	1.9	65.4	16.6	9.0	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.1	109.9
Kadungle	CAMM	<0.1	3.6	0.3	0.1	0.1	2.2	68.1	20.4	2.9	0.5	1.1	0.2	<0.1	0.1	0.2	100	6.9	102.7
Kadungle	CAN	0.1	4.1	0.3	0.1	0.1	1.8	65.1	17.1	9.1	0.5	1.2	0.2	<0.1	0.1	0.2	100	7.1	110.5
Koorawatha	CAN	0.1	4.1	0.3	0.2	0.1	1.9	64.7	17.2	9.1	0.6	1.2	0.2	0.1	0.1	0.2	100	7.2	110.3
Milvale	CAN	0.1	4.0	0.3	0.2	0.1	1.9	66.3	16.2	8.8	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.0	109.4
Parkes Sub	CAMM	0.1	3.9	0.3	0.1	0.1	2.4	66.8	21.0	3.1	0.6	1.1	0.2	<0.1	0.2	0.2	100	7.5	103.0
Parkes Sub	CAN	0.1	4.2	0.3	0.2	0.1	1.9	63.3	18.2	9.6	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.2	112.1
Parkes Sub	CANG	0.1	4.2	0.3	0.2	0.1	2.1	62.7	19.3	9.1	0.5	1.1	0.2	<0.1	0.1	0.1	100	7.4	112.3
Red Bend	CAN	0.1	4.0	0.3	0.2	0.1	1.9	64.5	17.3	9.1	0.5	1.2	0.2	0.3	0.1	0.2	100	7.0	110.7
Weedallion	CAN	0.1	4.0	0.3	0.1	0.1	1.8	67.6	15.6	8.2	0.5	1.1	0.2	<0.1	0.1	0.2	100	6.9	107.7
Wirrinya	CAN	0.1	4.1	0.3	0.2	0.1	1.9	65.3	16.7	9.1	0.5	1.2	0.2	0.1	0.1	0.2	100	7.1	110.2
Central NSW Mean		**0.1**	**4.1**	**0.3**	**0.2**	**0.1**	**2.0**	**64.3**	**17.7**	**9.0**	**0.5**	**1.1**	**0.2**	**<0.1**	**0.1**	**0.2**	**100**	**7.1**	**110.9**
Southern NSW																			
Griffith																			
Barellan	CAN	0.1	4.2	0.3	0.2	0.1	2.1	63.1	18.2	9.6	0.5	1.0	0.3	<0.1	0.1	0.1	100	7.5	112.0
Coleambaly	CAN	0.1	4.2	0.3	0.2	0.1	1.9	64.8	17.2	9.1	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.3	110.5
Merriwagga	CAN	0.1	4.3	0.3	0.1	0.1	1.9	64.2	17.3	9.3	0.6	1.1	0.3	<0.1	0.2	0.2	100	7.4	110.8
Narrandra	CAN	0.1	4.2	0.3	0.1	0.1	2.0	63.7	18.2	9.2	0.5	1.1	0.2	0.1	0.1	0.1	100	7.2	111.5
Rankin Springs	CAN	0.1	4.1	0.3	0.2	0.2	2.3	61.8	18.8	10.2	0.5	1.0	0.2	0.1	0.1	0.1	100	7.5	113.6
Tabbita	CAN	0.1	4.2	0.3	0.2	0.2	2.2	62.4	18.4	10.2	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.4	113.2

[1]Sat - 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

Region/ 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
Wagga Wagga																			
Boorowa	CAN	0.1	4.1	0.3	0.1	0.1	1.9	66.3	15.8	9.0	0.6	1.1	0.3	0.1	0.1	0.2	100	7.2	109.1
Boree Creek	CAN	0.1	4.1	0.3	0.1	0.1	1.8	65.4	16.9	8.9	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.1	110.0
Coolamon	CAN	0.1	4.3	0.3	0.2	0.1	2.1	61.8	19.4	9.6	0.5	1.0	0.2	0.1	0.1	0.2	100	7.5	113.1
Cootamundra	CAN	0.1	4.1	0.3	0.1	0.1	2.1	65.9	15.8	9.1	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.5	109.0
Cunningar	CAN	0.1	4.1	0.3	0.2	0.1	2.1	65.0	16.7	9.1	0.6	1.1	0.3	0.1	0.1	0.2	100	7.4	109.8
Harden	CAN	0.1	4.1	0.3	0.2	0.1	2.0	65.3	16.7	9.1	0.6	1.1	0.3	0.1	0.1	0.2	100	7.3	110.0
Henty West	CAN	0.1	4.2	0.3	0.2	0.2	2.3	62.8	18.5	9.0	0.6	1.1	0.3	0.1	0.1	0.2	100	7.8	111.0
Illabo	CAN	0.1	4.0	0.3	0.1	0.1	1.9	67.8	14.9	8.5	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.1	107.6
Junee	CAN	0.1	4.3	0.3	0.2	0.1	2.0	63.7	18.4	9.0	0.5	1.0	0.2	0.1	0.1	0.2	100	7.3	111.2
Lockhart	CANG	0.1	4.2	0.3	0.1	0.1	2.1	62.5	19.0	9.4	0.6	1.0	0.2	<0.1	0.1	0.1	100	7.5	112.5
Matong	CAN	0.1	4.1	0.3	0.2	0.1	2.0	64.6	16.8	9.5	0.6	1.2	0.3	0.1	0.1	0.2	100	7.3	110.6
Milbrulong	CAN	0.1	4.3	0.3	0.1	0.1	1.9	64.4	18.2	8.5	0.5	1.0	0.2	<0.1	0.1	0.2	100	7.3	110.3
Pleasant Hills	CAN	0.1	4.1	0.3	0.2	0.1	2.2	66.3	18.4	6.2	0.6	1.0	0.3	<0.1	0.1	0.2	100	7.5	106.2
Rand	CAN	0.1	4.2	0.3	0.1	0.1	2.0	64.3	17.9	8.8	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.3	110.5
Yerong Creek	CAN	0.1	4.1	0.3	0.1	0.1	2.0	65.9	16.7	8.6	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.2	109.2
Yuluma	CAN	0.1	4.2	0.3	0.1	0.1	2.0	60.5	20.4	10.2	0.5	1.1	0.2	0.1	0.1	0.2	100	7.2	115.2
West Wyalong																			
Stockinbingal	CANG	0.1	4.2	0.3	0.2	0.1	2.1	61.7	19.6	9.8	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.3	113.9
Wyalong																			
Ardlethan	CAN	0.1	4.0	0.3	0.2	0.1	2.1	64.3	17.3	9.5	0.5	1.1	0.2	<0.1	0.1	0.1	100	7.3	111.1
Maimuru	CAN	0.1	4.0	0.3	0.1	0.1	1.9	66.9	15.6	8.8	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.0	108.6
Temora	CAN	0.1	4.1	0.3	0.1	0.1	1.9	65.6	16.7	8.7	0.6	1.1	0.2	0.1	0.1	0.2	100	7.2	109.4
Wyalong	CAN	0.1	4.0	0.3	0.2	0.1	1.9	66.5	15.7	9.0	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.1	109.1
Southern NSW Mean		**0.1**	**4.1**	**0.3**	**0.2**	**0.1**	**2.0**	**64.5**	**17.5**	**9.1**	**0.5**	**1.1**	**0.3**	**0.1**	**0.1**	**0.2**	**100**	**7.3**	**110.6**
NSW Mean		**0.1**	**4.1**	**0.3**	**0.2**	**0.1**	**2.0**	**64.3**	**17.7**	**9.1**	**0.5**	**1.1**	**0.2**	**<0.1**	**0.1**	**0.2**	**100**	**7.2**	**111.0**
NSW Min		*<0.1*	*3.5*	*0.3*	*0.1*	*0.1*	*1.8*	*60.5*	*13.8*	*2.9*	*0.4*	*0.9*	*0.2*	*<0.1*	*0.1*	*0.1*	*100*	*6.6*	*96.8*
NSW Max		*0.1*	*4.4*	*0.3*	*0.2*	*0.2*	*2.4*	*74.5*	*21.0*	*10.4*	*0.7*	*1.4*	*0.3*	*0.3*	*0.2*	*0.3*	*100*	*7.9*	*115.2*

[1] Sat - 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

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
Port Adelaide																			
Adelaide Area																			
Pt Adelaide	CANO	0.1	4.5	0.4	0.2	0.1	2.1	60.5	19.3	11.1	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.6	115.5
Murray Mallee																			
Parilla	CANO	0.1	4.3	0.3	0.2	0.2	1.9	60.1	19.7	11.2	0.5	1.0	0.2	0.1	0.1	0.1	100	7.3	116.3
Northern Area																			
Andrews	CANO	0.1	4.3	0.3	0.2	0.1	2.0	65.3	16.5	9.1	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.4	109.7
Bowmans	CANO	0.1	4.3	0.3	0.2	0.1	2.1	63.2	18.1	9.5	0.6	1.1	0.3	0.1	0.1	0.1	100	7.5	111.7
Caltowie	CANO	0.1	4.2	0.3	0.1	0.1	2.0	64.6	17.2	9.1	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.4	110.3
Roseworthy	CANO	0.1	4.2	0.3	0.2	0.1	2.1	64.8	16.7	9.3	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.5	110.2
South East																			
Frances	CANO	0.1	4.2	0.3	0.2	0.1	2.0	63.8	17.5	9.6	0.6	1.1	0.2	<0.1	0.1	0.1	100	7.4	111.6
Keith	CANO	0.1	4.3	0.3	0.2	0.1	2.1	62.1	18.4	10.2	0.6	1.1	0.2	0.1	0.1	0.1	100	7.6	113.1
Millicent	CANO	0.1	4.2	0.3	0.2	0.2	2.1	60.7	19.0	11.1	0.6	1.0	0.3	<0.1	0.1	0.2	100	7.5	115.2
Tailem Bend	CANO	0.1	4.2	0.3	0.2	0.1	2.0	62.8	17.7	10.6	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.2	113.5
Wolseley	CANO	0.1	4.3	0.3	0.2	0.1	2.2	63.4	17.5	9.7	0.6	1.0	0.3	<0.1	0.1	0.1	100	7.8	111.2
Port Adelaide Mean		**0.1**	**4.3**	**0.3**	**0.2**	**0.1**	**2.1**	**63.2**	**17.7**	**9.9**	**0.6**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**100**	**7.5**	**112.2**
Pt Giles																			
Yorke Peninsula																			
Ardrossan	CANO	0.1	4.2	0.3	0.2	0.1	2.1	61.8	18.6	10.6	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	114.2
Port Giles Mean		**0.1**	**4.2**	**0.3**	**0.2**	**0.1**	**2.1**	**61.8**	**18.6**	**10.6**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**100**	**7.4**	**114.2**
Pt Lincoln																			
Eyre Peninsula																			
Cummins	CANO	0.1	4.1	0.3	0.2	0.1	1.9	64.1	17.1	9.9	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.2	111.9
Pt. Lincoln	CANO	0.1	4.2	0.3	0.2	0.1	2.0	63.0	17.9	10.1	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.4	112.6
Rudall	CANO	0.1	4.6	0.3	0.2	0.1	1.8	59.7	20.7	10.5	0.5	1.0	0.2	0.1	0.1	0.1	100	7.4	115.8
Ungarra	CANO	0.1	4.3	0.3	0.2	0.1	1.8	63.2	17.6	10.4	0.5	1.0	0.3	0.1	0.1	0.2	100	7.2	113.1
Yeelanna	CANO	0.1	4.3	0.3	0.2	0.1	1.9	63.5	17.8	9.7	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.4	111.9
Port Lincoln Mean		**0.1**	**4.2**	**0.3**	**0.2**	**0.1**	**1.9**	**63.3**	**17.7**	**10.0**	**0.6**	**1.1**	**0.3**	**<0.1**	**0.1**	**0.1**	**100**	**7.3**	**112.5**
SA Mean		**0.1**	**4.2**	**0.3**	**0.2**	**0.1**	**2.0**	**63.1**	**17.8**	**10.0**	**0.6**	**1.0**	**0.3**	**<0.1**	**0.1**	**0.1**	**100**	**7.4**	**112.5**
SA Min		*0.1*	*4.1*	*0.3*	*0.1*	*0.1*	*1.8*	*59.7*	*16.5*	*9.1*	*0.5*	*0.9*	*0.2*	*<0.1*	*0.1*	*0.1*	*100*	*7.2*	*109.7*
SA Max		*0.1*	*4.6*	*0.4*	*0.2*	*0.2*	*2.2*	*65.3*	*20.7*	*11.2*	*0.6*	*1.1*	*0.3*	*0.1*	*0.1*	*0.2*	*100*	*7.8*	*116.3*

[1] Sat - 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

Region/ 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
North West Vic																			
Horsham																			
Murtoa	CAN	0.1	4.2	0.3	0.2	0.1	2.1	64.3	17.1	9.5	0.6	1.0	0.3	<0.1	0.1	0.1	100	7.5	110.9
Natimuk	CAN	0.1	4.1	0.3	0.1	0.1	1.8	65.7	15.8	9.6	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.2	110.3
Warracknabeal	CAN	0.1	4.3	0.3	0.2	0.2	2.0	63.3	18.0	9.7	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	112.0
Ouyen																			
Beulah	CAN	0.1	4.6	0.3	0.2	0.2	2.0	60.1	19.8	11.1	0.4	0.9	0.2	<0.1	0.1	0.1	100	7.5	116.0
Rainbow	CAN	0.1	4.3	0.3	0.2	0.2	2.2	62.0	18.8	10.2	0.5	0.9	0.2	<0.1	0.1	0.1	100	7.5	113.6
Swan Hill																			
Quambatook	CAN	0.1	4.4	0.3	0.2	0.2	2.1	62.0	18.8	10.3	0.4	0.9	0.2	<0.1	0.1	0.1	100	7.4	113.8
North West Mean		**0.1**	**4.3**	**0.3**	**0.2**	**0.1**	**2.0**	**63.6**	**17.5**	**9.9**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**100**	**7.4**	**112.0**
South East Vic																			
Marong East																			
Barnes Crossing	CAN	0.1	4.1	0.3	0.2	0.1	2.1	62.3	18.6	10.3	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.3	113.8
Dookie	CAN	0.1	4.1	0.3	0.1	0.1	1.9	65.3	16.8	9.1	0.5	1.1	0.2	0.1	0.1	0.1	100	7.1	110.3
Elmore	CAN	0.1	4.5	0.3	0.1	0.1	1.9	63.1	19.0	9.0	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	111.8
Oaklands	CAN	0.1	4.1	0.3	0.1	0.1	1.8	67.2	15.6	8.4	0.5	1.2	0.3	0.2	0.1	0.1	100	7.0	108.1
Yarrawonga	CAN	0.1	4.1	0.3	0.2	0.1	2.1	64.7	16.8	9.8	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.2	111.5
Marong South																			
Berrybank	CAN	0.1	4.2	0.3	0.1	0.1	1.8	64.2	16.5	10.5	0.5	1.1	0.3	<0.1	0.1	0.2	100	7.1	112.5
Boort	CAN	0.1	4.2	0.3	0.2	0.2	2.2	64.1	17.5	9.4	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.4	111.2
Donald	CAN	0.1	4.2	0.3	0.2	0.2	2.2	63.5	17.8	9.6	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.5	111.6
Dunolly	CAN	0.1	4.1	0.3	0.1	0.1	2.0	64.0	17.4	9.8	0.5	1.1	0.2	0.1	0.1	0.1	100	7.2	111.8
Hamilton	CAN	0.1	4.3	0.3	0.1	0.1	1.9	62.1	18.6	10.5	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.2	114.3
Westmere	CAN	0.1	4.2	0.3	0.1	0.1	1.9	63.8	16.8	10.3	0.6	1.2	0.3	<0.1	0.1	0.2	100	7.4	112.1
Willaura	CAN	0.1	4.2	0.3	0.1	0.1	1.9	64.3	16.6	10.2	0.6	1.1	0.3	<0.1	0.1	0.1	100	7.3	111.9
South East Mean		**0.1**	**4.2**	**0.3**	**0.1**	**0.1**	**2.0**	**64.1**	**17.3**	**9.7**	**0.5**	**1.1**	**0.2**	**<0.1**	**0.1**	**0.1**	**100**	**7.2**	**111.6**
Victoria Mean		**0.1**	**4.2**	**0.3**	**0.2**	**0.1**	**2.0**	**64.0**	**17.4**	**9.8**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**100**	**7.3**	**111.8**
Victoria Min		*0.1*	*4.1*	*0.3*	*0.1*	*0.1*	*1.8*	*60.1*	*15.6*	*8.4*	*0.4*	*0.9*	*0.2*	*<0.1*	*0.1*	*0.1*	*100*	*7.0*	*108.1*
Victoria Max		*0.1*	*4.6*	*0.3*	*0.2*	*0.2*	*2.2*	*67.2*	*19.8*	*11.1*	*0.6*	*1.2*	*0.3*	*0.2*	*0.1*	*0.2*	*100*	*7.5*	*116.0*

[1] Sat - 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	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	CAG1	0.1	4.4	0.3	0.2	0.1	2.1	61.2	19.6	10.2	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.5	114.3
Albany	CAN1	0.1	4.3	0.3	0.1	0.1	1.9	62.6	18.1	10.2	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.3	113.1
Albany	CAN1&2	0.1	4.5	0.3	0.1	0.1	1.9	61.4	19.3	10.1	0.6	1.1	0.3	<0.1	0.1	0.2	100	7.5	113.9
Albany	CAN2	0.1	4.1	0.3	0.1	0.1	1.8	64.7	16.8	9.7	0.6	1.2	0.3	<0.1	0.1	0.2	100	7.0	111.4
Albany Zone Mean		**0.1**	**4.3**	**0.3**	**0.1**	**0.1**	**1.9**	**62.5**	**18.3**	**10.1**	**0.6**	**1.1**	**0.3**	**<0.1**	**0.1**	**0.2**	**100**	**7.3**	**113.1**
Esperance																			
Esperance	CAG1	0.1	4.4	0.3	0.2	0.1	2.1	61.9	19.0	10.1	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.5	113.6
Esperance	CAG2	0.1	4.7	0.3	0.2	0.1	2.1	60.1	20.1	10.4	0.6	1.0	0.3	<0.1	0.1	0.1	100	7.9	114.7
Esperance	CAN1	0.1	4.3	0.3	0.1	0.1	1.8	62.9	17.9	10.2	0.5	1.1	0.2	<0.1	0.1	0.3	100	7.2	113.0
Esperance Zone Mean		**0.1**	**4.4**	**0.3**	**0.2**	**0.1**	**1.9**	**62.4**	**18.3**	**10.2**	**0.5**	**1.1**	**0.2**	**<0.1**	**0.1**	**0.2**	**100**	**7.4**	**113.3**
Geraldton																			
Geraldton	CAG1	0.1	4.3	0.3	0.2	0.1	2.0	62.9	18.7	9.6	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.3	112.7
Geraldton	CAN1	0.1	4.2	0.3	0.1	<0.1	1.7	62.0	19.6	9.8	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.0	114.1
Geraldton	CAN2	0.1	4.3	0.3	0.1	0.1	1.7	60.9	19.9	10.2	0.5	1.2	0.2	0.1	0.1	0.2	100	7.1	114.9
Geraldton Zone Mean		**0.1**	**4.3**	**0.3**	**0.1**	**0.1**	**1.8**	**62.1**	**19.4**	**9.8**	**0.5**	**1.1**	**0.2**	**<0.1**	**0.1**	**0.1**	**100**	**7.1**	**113.8**
Kwinana																			
Kwinana	CAG1	0.1	4.4	0.3	0.2	0.1	2.1	61.9	19.3	9.7	0.5	1.0	0.2	<0.1	0.1	0.1	100	7.5	113.2
Kwinana	CAN1	0.1	4.4	0.3	0.1	0.1	1.9	61.9	19.1	9.8	0.5	1.1	0.2	<0.1	0.1	0.2	100	7.4	113.2
Kwinana	CAN1&2	0.1	4.5	0.3	0.2	0.1	1.9	62.1	18.6	10.2	0.5	1.0	0.2	<0.1	0.1	0.2	100	7.4	113.5
Kwinana	CAN2	0.1	4.7	0.3	0.2	0.1	1.8	58.8	20.9	10.5	0.6	1.2	0.3	<0.1	0.1	0.3	100	7.8	115.5
Kwinana Zone Mean		**0.1**	**4.4**	**0.3**	**0.2**	**0.1**	**1.9**	**61.8**	**19.2**	**9.9**	**0.5**	**1.1**	**0.2**	**<0.1**	**0.1**	**0.2**	**100**	**7.4**	**113.3**
York																			
York	CAN1	0.1	4.2	0.3	0.1	0.1	1.8	65.1	16.7	9.3	0.6	1.2	0.3	<0.1	0.1	0.2	100	7.2	110.3
York Zone Mean		**0.1**	**4.2**	**0.3**	**0.1**	**0.1**	**1.8**	**65.1**	**16.7**	**9.3**	**0.6**	**1.2**	**0.3**	**<0.1**	**0.1**	**0.2**	**100**	**7.2**	**110.3**
WA Mean		**0.1**	**4.4**	**0.3**	**0.1**	**0.1**	**1.9**	**62.2**	**18.8**	**10.0**	**0.5**	**1.1**	**0.2**	**<0.1**	**0.1**	**0.2**	**100**	**7.4**	**113.3**
WA Min		*0.1*	*4.1*	*0.3*	*0.1*	*<0.1*	*1.7*	*58.8*	*16.7*	*9.3*	*0.5*	*1.0*	*0.2*	*<0.1*	*0.1*	*0.1*	*100*	*7.0*	*110.3*
WA Max		*0.1*	*4.7*	*0.3*	*0.2*	*0.1*	*2.1*	*65.1*	*20.9*	*10.5*	*0.6*	*1.2*	*0.3*	*0.1*	*0.1*	*0.3*	*100*	*7.9*	*115.5*

[1] Sat - 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

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 %		
	NSW	SA	WA	NSW	SA	WA	NSW	SA	WA
08H5050	46.0	*	*	40.0	*	*	13	*	*
AN11R5181	42.2	44.4	44.2	42.3	38.6	39.8	11	8	7
AN11R5231	44.8	*	44.2	37.4	*	38.8	7	*	6
Archer	*	43.3	*	*	39.2	*	*	7	*
ATR Cobbler	43.2	41.8	42.0	40.7	39.8	41.5	16	13	17
ATR Gem	44.8	43.9	44.0	39.8	39.7	40.3	7	5	7
ATR Snapper	46.9	44.7	44.7	39.6	39.4	41.3	4	3	5
ATR Stingray	43.8	42.9	42.6	41.9	40.7	42.4	6	4	5
AV Garnet	42.9	44.1	*	41.1	37.7	*	15	9	*
AV Zircon	44.0	44.5	*	39.4	37.3	*	10	6	*
Bonanza TT	41.3	42.2	41.7	42.9	41.2	42.0	10	5	7
Carbine	*	42.1	*	*	40.7	*	*	8	*
CB Agamax	42.5	43.4	*	39.3	37.2	*	9	7	*
CB Atomic HT	*	42.1	42.2	*	41.6	43.4	*	6	8
CB Eclipse RR	42.2	41.5	40.9	38.9	36.9	40.8	8	8	7
CB Frontier RR	45.0	*	43.0	36.8	*	39.7	6	*	6
CB Henty HT	43.7	42.6	40.6	40.0	40.6	43.5	10	6	7
CB Jardee HT	43.3	41.8	42.2	39.1	39.2	40.2	9	7	7
CB Junee HT	43.2	41.3	42.1	40.4	39.8	40.6	8	6	7
CB Nitro HT	*	*	43.2	*	*	43.4	*	*	3
CB StatusRR	*	46.9	43.0	*	32.2	39.0	*	3	4
CB Sturt TT (CBWA-106)	41.7	41.1	40.6	42.3	40.8	42.1	10	6	8
CB Tango C	44.6	44.2	*	40.3	37.9	*	6	4	*
CB Telfer	42.7	41.4	42.0	42.1	41.0	42.2	5	4	4
CBWA-134 RR	41.3	40.5	*	40.4	40.4	*	5	3	*
CBWA-136RR	46.8	*	44.1	38.7	*	39.4	12	*	14
CHYB0297	41.8	42.3	*	41.6	38.2	*	9	6	*
CHYB1120RR	45.6	*	44.0	37.9	*	40.1	8	*	8
CHYB1297 RR	42.4	41.2	41.2	40.1	38.8	41.3	17	25	13
CHYB1368	43.9	40.9	*	42.3	43.2	*	8	6	*
CHYB1380	43.7	*	*	42.1	*	*	5	*	*
Crusher TT	43.4	42.2	41.1	38.8	38.3	39.7	14	10	13
GT Cobra	44.8	42.8	43.8	39.9	39.8	40.0	8	11	8
GT Viper	44.1	44.3	43.9	39.8	39.2	38.9	6	5	4
HC1050	46.9	*	44.4	37.4	*	39.4	12	*	11
HC1065	45.2	47.2	44.3	41.0	38.6	40.6	17	15	14
Hyola 404RR	47.7	46.9	45.8	39.9	38.7	40.7	6	7	7
Hyola 433	44.7	*	*	40.9	*	*	12	*	*
Hyola 474CL	44.7	44.1	44.6	42.1	41.0	42.4	13	10	11
Hyola 50	45.5	44.1	*	39.5	38.0	*	8	6	*
Hyola 505RR	48.2	*	47.2	40.4	*	41.4	6	*	5
Hyola 555TT	43.8	43.1	42.1	41.5	40.3	42.2	11	9	12
Hyola 559TT	45.3	43.6	44.1	41.2	40.7	41.8	6	6	7
Hyola 575CL	44.4	43.3	43.9	41.9	40.6	41.3	11	9	9
Hyola 656TT	45.1	43.1	44.2	40.9	41.3	41.7	6	5	8
IH50 RR	44.5	*	43.7	39.1	*	38.7	8	*	8
Jackpot TT	44.8	43.7	43.7	42.1	40.5	41.6	7	5	8
K10038	*	*	41.6	*	*	40.0	*	*	13
M1662	44.3	44.2	*	44.3	41.0	*	9	11	*

* 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 %		
	NSW	SA	WA	NSW	SA	WA	NSW	SA	WA
M95027	46.9	*	44.6	40.5	*	37.4	5	*	10
M95030	47.7	*	43.9	40.5	*	37.7	6	*	11
M95194	45.5	50.3	43.0	44.6	35.7	44.2	7	5	11
M95199	44.0	50.4	41.6	45.6	35.8	44.2	7	5	10
Monola 506TT	45.4	44.0	43.4	41.7	41.2	41.6	4	4	5
Monola 605TT	43.6	42.4	42.2	41.5	40.3	41.1	12	8	10
Monola 76TT	*	*	44.5	*	*	40.6	*	*	7
NG0457	46.0	46.0	45.8	39.9	38.6	39.4	7	8	7
NHC1088	44.9	46.8	44.0	41.3	38.8	41.4	18	16	15
NHC1201	44.8	46.5	*	40.3	37.3	*	7	6	*
NHC1202	45.1	45.3	*	39.0	37.5	*	11	9	*
NHC1203	45.5	47.5	*	37.8	36.6	*	16	12	*
NL0606	44.8	43.2	43.6	42.8	42.1	43.3	9	7	9
NP0482	43.4	42.7	42.5	40.3	39.3	40.1	7	8	7
NP0549	47.0	46.1	46.1	42.2	42.0	40.6	8	8	8
NP0664	47.1	45.3	45.2	38.9	38.5	39.9	5	6	5
NT0174	44.3	43.2	43.5	43.1	42.2	43.3	6	4	6
NT0183	45.5	44.4	45.0	41.0	40.0	40.5	8	6	7
NT0184	46.0	44.4	43.8	39.7	39.6	40.5	6	5	8
Pioneer 09N121I	42.7	41.9	42.5	38.8	37.9	39.3	8	6	7
Pioneer 09N146I	42.0	41.2	41.7	40.9	39.5	40.7	10	7	8
Pioneer 09N149I	42.6	41.4	41.4	39.7	38.7	40.7	7	6	7
Pioneer 10N523R	45.0	43.5	43.4	39.6	40.1	40.7	8	10	8
Pioneer 10N524R	47.0	*	44.6	36.6	*	38.7	5	*	5
Pioneer 10N527R	*	*	44.1	*	*	39.6	*	*	7
Pioneer 10N572R	47.1	*	44.4	37.3	*	40.4	6	*	6
Pioneer 11N047R	45.8	*	44.7	39.8	*	40.3	7	*	7
Pioneer 11N048R	46.1	49.7	44.8	38.7	34.9	40.6	6	3	5
Pioneer 11N138I	45.2	42.9	43.2	37.6	40.4	40.7	8	7	7
Pioneer 43C80 (CL)	42.0	42.5	40.9	42.7	39.3	43.3	9	6	7
Pioneer 43Y23 (RR)	44.5	43.6	43.4	39.3	37.7	39.4	8	7	7
Pioneer 43Y85 (CL)	42.0	41.6	42.8	41.4	38.7	39.9	13	11	10
Pioneer 44Y84 (CL)	44.9	43.9	43.5	39.9	38.6	41.3	9	7	8
Pioneer 45Y22 (RR)	45.3	*	43.3	37.4	*	39.9	9	*	8
Pioneer 45Y82 (CL)	43.6	42.8	43.4	40.3	39.1	40.3	9	7	8
Pioneer 45Y86 (CL)	45.7	43.3	45.0	40.0	39.9	40.4	9	7	8
Pioneer01TT	44.4	44.1	43.9	44.2	42.3	43.5	8	6	9
SMHC105CL	45.0	42.4	42.3	38.9	39.8	41.3	9	8	9
SMHC111CL	44.6	43.1	42.7	40.5	39.5	42.5	10	9	10
SMHC121CL	42.9	40.7	41.1	38.8	39.1	41.4	10	9	10
T18097	*	43.1	44.4	*	42.2	38.3	*	5	11
Thumper TT	44.7	44.5	44.1	42.1	40.5	41.1	7	6	7
Victory V3001	42.4	41.4	*	41.0	37.1	*	18	11	*
Victory V3002	43.4	43.7	*	42.5	39.5	*	14	9	*
Victory V3003	43.8	44.3	*	43.0	39.2	*	12	7	*
Victory V5002RR	46.1	44.7	*	41.7	41.2	*	14	19	*
VT 525 G	*	44.9	43.8	*	40.9	41.4	*	10	11
VT 535 G	45.7	*	43.7	43.5	*	43.6	7	*	9
VT X121 CL	*	40.5	39.2	*	44.5	50.4	*	14	9

* Variety not grown in state.

Table 11 (Continued): NVT Quality Data

Variety	Oil (% in whole seed			Protein (% in oil free meal			Glucosinolates (µmoles/g in whole		
	NSW	SA	WA	NSW	SA	WA	NSW	SA	WA
Juncea Canola									
J07Z-01904	43.3	42.5	39.4	44.1	42.4	49.4	17	15	14
JB0T-800350	37.8	37.1	37.1	47.0	45.5	46.7	30	28	15
JB0T-903155	39.6	36.1	38.9	45.5	45.8	46.5	22	29	14
JB0T-907988	40.8	39.7	39.4	46.5	44.3	47.2	17	17	13
VT X121 CL	41.6	*	*	45.5	*	*	14	*	*
SARDI515M	*	42.8	*	*	40.0	*	*	13	*
Xceed Oasis CL	44.4	43.8	*	45.1	43.7	*	13	15	*

* Variety not grown in state.

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 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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