Department of Primary Industries
Department of Regional NSW

NSW GOVERNMENT

Quality of Australian canola 2023–24

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AOF Australian Oilseeds Federation

Department of Primary Industries
Department of Regional NSW

Quality of Australian canola 2023–24

KG Graham
NSW Department of Primary Industries
Wagga Wagga

KA Hertel
NSW Department of Primary Industries
Dubbo

NC Goddard
Australian Oilseeds Federation
Sydney

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Cover

Photo: Leanne Groves (NSW DPI Wagga Wagga). Taken from a hot air balloon on 15 September 2023 over Temora, NSW.

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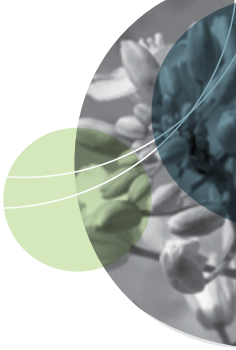


Introduction

Sample analysis

Canola samples representing the 2023 harvest were received from GrainCorp Operations Limited (Queensland, New South Wales and Victoria), Viterra Pty Ltd (South Australia) and CBH Group (Western Australia). These samples represent the seed collected at each receival point and have been taken to cumulatively represent the Australian harvest. Samples representing each of the 4 port zones were received from Western Australia. The NSW Department of Primary Industries (NSW DPI) Oil Testing Service (OTS) has no control over sample collection and all data reported derives from analysing the provided samples. This year, one sample was submitted from the Goondiwindi zone in Queensland by GrainCorp Operations Limited. This sample from southern Queensland has been incorporated into the northern New South Wales data.

All averages reported are weighted, based on the tonnage represented.

Each sample was analysed for oil, protein and glucosinolate content; fatty acid composition and volumetric grain weights according to the standard methods outlined in the Methods section at the back of this publication. The NSW DPI OTS performed all analyses on the samples. Oil content is reported at 6% moisture in whole seed, protein content is reported in oil-free meal at 10% moisture, and glucosinolate content is reported in oil-free meal at 10% moisture.

The NSW DPI OTS at Wagga Wagga prepared composite samples to determine chlorophyll content. Composite samples were prepared to represent GrainCorp's northern and southern New South Wales and Victorian regions and Viterra's Adelaide, Central, Eastern and Western regions in South Australia. Western Australia's 4 port zone samples were analysed as received from CBH. Composite samples were created on a per weight basis to proportionally represent each site.

Units of measurement

Unless otherwise stated, units of measurement are as follows:

Oil content – % oil, whole seed at 6% moisture

Protein content – % protein, oil-free meal at 10% moisture

Glucosinolate content – µmoles/g, oil-free meal at 10% moisture

Test weight – kg/hL, on clean seed

Oleic acid (18:1) content – % of total fatty acids

Linoleic acid (18:2) content – % of total fatty acids

Linolenic acid (18:3) content – % of total fatty acids

Saturated fatty acids content – % of total fatty acids

Monounsaturated fatty acids content – % of total fatty acids

Polyunsaturated fatty acids content – % of total fatty acids

Chlorophyll content – mg/kg in whole seed, as received

Sustainability of Australian canola

The majority of Australian canola exports over the past 15 years have been certified as sustainable under one of two internationally recognised sustainability certification schemes (ISCC and 2BSvs).

Sustainability certification has been a requirement of the European Union (EU) for all canola exports to the EU destined for the bioenergy market. Since sustainability certification began in 2009, over 27.2 million tonnes of canola have been supplied to the EU as certified sustainable representing A$19 billion (Free on Board to April 2024).

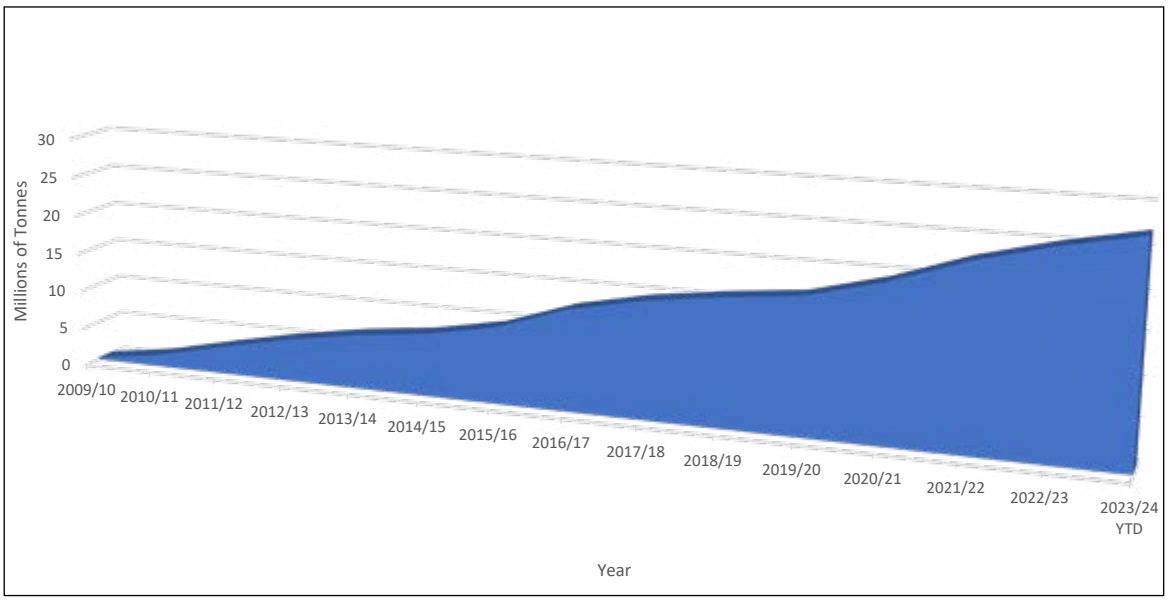
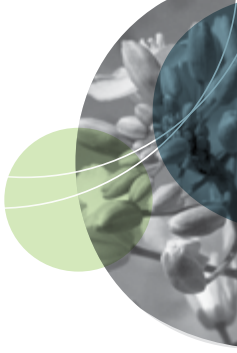


Figure 1. Certified sustainable canola export to the EU (cumulative to April 2024).

The success of Australian farmers to be able to supply certified sustainable canola has driven confidence within other markets to source high and consistent quality, certified sustainable Australian canola. From the 2023 harvest, over 4.0 million tonnes, representing two-thirds of the 2023–24 crop, was traded as certified sustainable into the food and feed markets, in addition to the European bioenergy market. This canola was sourced from over 6,000 Australian farms.

In 2023 all Australian sustainable canola has been certified under the ISCC scheme, providing assurance to the market with a consistent and rigorous certification scheme that is widely recognised and accepted across the value chain. The added benefit of the ISCC scheme is the equivalence with the Sustainable Agriculture Initiative, enabling the food and feed market to use oil and meal from certified sustainable Australian canola to help them meet their corporate sustainability sourcing commitments.



Weather and production review

Overview

Seasonal predictions leading into the 2023–24 Australian canola growing season were consistently for hotter and drier conditions over most of Australia. After above average rainfall throughout the summer fallow period, soil moisture reserves in general were average to above average as optimum sowing windows approached. Early grower confidence was a balance between the forecast season outlook and available soil water.

In most regions, the opening autumn rainfall timing was ideal to enable the majority of the national crop area to be sown by the end of April. Most areas had sufficient seedbed moisture for rapid germination and in instances of well-timed follow-up rain, there was rapid and uniform crop emergence. A contrast was in the northern areas in Western Australia where limited seedbed moisture caused patchy crop establishment, and in the northern and north-western areas of NSW where no rain was received in time for any canola to be sown for the 2023 season.

The majority of central and northern NSW, Queensland, Western Australia, and parts of South Australia all had below average rainfall for the growing season. Large areas measured decile 1 rainfall. There were many instances of new low rainfall records. Much of the crop relied on conserved soil moisture. At the same time, apart from June, other months in the growing season were much warmer than usual (decile 8–10). This hastened crop growth and development and increased crop water use in the spring during late flowering and pod fill. Lack of rain and above average temperatures in spring, combined with rapidly depleting soil water reserves, created instances of moisture-stressed crops. This reduced expected crop yields. Rapid crop maturity resulted in early windrowing and harvest activities, up to 3–4 weeks earlier than usual.

Of note were crops performing better under poor seasonal conditions. This is attributed to a significant shift in the closer attention to agronomic management, starting at harvest in the previous season. There is a greater focus on fallow management to maintain ground cover, conserve soil moisture and manage weeds. Care regarding sowing time, seed placement, tactical timing of fertiliser and in-crop pesticides, and harvest management are standard practice. The sum of small incremental agronomic improvements is shown in the canola yields in a growing season that was distinguished by multiple new adverse Australian climate records.

See figures 2–5 for Bureau of Meteorology rainfall decile maps for Australia, 2023.

Australian canola area decreased by 6% on the previous year to 3,596,000 ha. Compared to the 5 year and 10 year average, the canola area was 15% and 6% higher respectively.

Australian canola production decreased by 27% on the previous year to 5,802,000 tonnes. Compared to the 5 year and 10 year average, production was 10% and 5% higher respectively.

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Bureau of Meteorology

http://www.bom.gov.au/climate/maps/rainfall/?variable=rainfall&map=decile&period=12month&region=nat&year=2023&month=12&day=31

New South Wales

The NSW crop area decreased by 2% on the previous year to 866,000 ha in 2023. Widespread effective rainfall over the 2022–23 summer fallow period resulted in high stored soil moisture levels across most NSW growing regions at the end of summer. The combination of grower confidence and crop potential resulted in planned increases in canola area in the 2023–24 season.

Effective rainfall was recorded throughout most growing regions, apart from the north and north-west, in late March and early April. It enabled approximately 75% of the NSW canola area to be sown early in the sowing window into near full soil water profiles, topped with good seedbed moisture. Dry weather prevailed throughout May. Emergence in most of the later sown crops sown into marginal moisture was patchy, with some failures. The absence of timely rainfall in northern NSW resulted in only a small area of canola sown in the north-east.

Follow up rainfall in June was widespread, but variable. Across southern NSW, multiple rain events exceeding 10 mm throughout June and into July, maintained yield potential. In the same period, parts of central NSW, extending to the western edges, had patchy falls of 3–10 mm in moisture-stressed later sown crops. This disparity prompted further slug control activities in some wet southern areas, and emerging aphid pressure in the moisture-stressed crops in central NSW.

Early sown crops continued to grow and develop rapidly in the above average temperatures, their roots accessing deeper moisture. Many growers acted on early opportunities to top-dress nitrogen as crop potential was maintained or improved upon.

Throughout spring, most crops received little if any effective rainfall. Crop development was typically accelerated by a couple of weeks in some areas, with flowering starting at the beginning of July in south-western NSW. During this period, the deep rooting depth of some crops extended up to 4 m, allowing crops to access moisture to meet crop demand in an otherwise dry spring period. This was crucial in enabling crops to fill and achieve closer to potential yields. Weather conditions in southern NSW favoured the development of low to moderate levels of *Sclerotinia* in some districts, causing some yield reductions.

In all districts, the above average temperatures throughout most of the growing season hastened crop maturity and led to the earliest known start of windrowing and harvest activities for many farmers. In the western areas, crops were the first to mature. This advantage enabled seed fill to be largely completed before the onset of critical higher temperatures and was reflected in the above average yield and oil levels.

The final estimated production for NSW was 1.34 million tonnes from an estimated 866,000 ha, averaging 1.55 t/ha.

Victoria

The Victorian crop area decreased by 5% on the previous year to 601,000 ha in 2023. Stored soil moisture declined to below average throughout February and March across the main canola growing areas before sowing. At the same time, long-term forecasts were predicting a hotter and drier season.

The seasonal break came in mid-April. Widespread rainfall measured average or wetter, except for the far northern Mallee and most of Gippsland, which was drier. The rainfall enabled widespread early sowing except for the far Mallee. Most of the intended canola area was sown by the end of April, with good follow-up rainfall recorded in the southern areas.

Following a dry spell during most of May, above average rainfall in late May and June, up to decile 10, caused waterlogging in some areas dominated by heavier textured soils. Following early pest pressure, particularly slugs in mid-April in the wettest areas, further urgent slug control was required in June where unprecedented numbers were reported.

During June, temperatures were above average (decile 8–9) and very much above average (decile 10), a contrast to the below to the very much below average (decile 1–3) May temperatures. New records of the highest minimum and maximum temperatures were set in some locations. By the end of June, there were excellent soil moisture reserves. Many crops had been topdressed to meet higher yield potentials. Shortages of urea supplies restricted some planned topdressing, capping yield potentials in some crops.

Late winter and throughout spring met predicted forecasts of hotter (decile 8–10) and drier (mostly decile 1–3) conditions. Crop growth was rapid, relying largely on stored subsoil moisture, that was progressively depleted. Effective rainfall in early October across large areas of the canola production regions was significant for arresting crop yield decline. Rain in some areas delayed harvest activities in late November and December.

The final estimated production for Victoria was 1.41 million tonnes from an estimated 601,000 ha, averaging 2.35 t/ha.

South Australia

The South Australian crop area decreased by 7% on the previous year to 284,000 ha in 2023. The outlook for the winter period was for drier and hotter than average conditions. As a result, some growers reduced their planned canola area in the more marginal production districts.

The main autumn rainfall break was in early April. Some crops were sown dry before the rain, but most were sown straight after Easter into average to above average soil moisture conditions.

Pest pressure from slugs, snails and mice during early crop establishment were managed with no significant crop damage or losses reported. Following a dry May, June rain and temperatures were above average. Crops grew rapidly and above average yield

potentials were on-track. Follow-up rain in late June increased already good soil moisture reserves and increased confidence. Topdressing nitrogen was widespread ahead of the forecast rain, tightening urea supply capacities.

June weather favoured slugs to levels not previously seen. Multiple control operations were required in some areas. Crop damage and some losses were reported. In early winter, crop yield potential was above average, despite challenges from pests.

Just before flowering, most districts reported 70%+ soil moisture profiles. However, below average rainfall (decile 1–3) and above average temperatures (decile 8–10) was recorded throughout late winter and spring. Earlier sown crops fared best with their deeper, well developed root systems accessing stored soil moisture. Later sown crops and those on poorer soils showed signs of moisture stress during late flowering/early podding. The higher temperatures increased rates of crop water use. As soil moisture reserves were depleted, potential yields were reduced.

Above average temperatures throughout most of the growing season hastened crop growth and development. Windrowing began in mid-October in the Mid North region. Many growers reported their earliest ever start for windrowing and harvest.

Weather conditions allowed an uninterrupted windrowing and harvest period. Canola yields were average to slightly above, with lower oil contents reported in early finishing crops.

The final estimated production for South Australia was 468,000 tonnes from an estimated 284,000 ha, averaging 1.65 t/ha.

Western Australia

The Western Australian crop area decreased by 9% on the previous year to 1,845,000 ha in 2023. The various canola production regions had very different growing seasons.

The predicted high likelihood of drier and warmer autumn conditions remained until the arrival of several successive weather systems in late March and early April. Rainfall from these systems changed the minimal root zone soil moisture levels to well above average over much of the grain-production regions with some variability. In the southern areas the increase in soil moisture levels stalled at below average. The seedbed moisture prompted widespread sowing activity, especially in the Central and Southern regions. Rapidly drying seedbeds in northern grain belt regions contracted the sowing window. Between 50% and 70% of the intended canola area was sown following these rainfall events.

The absence of follow-up rain in May (decile 1–3) caused patchy germination and emergence in crops where seedbed moisture was dry and marginal. Widespread rain across several events in the first half of June improved crop prospects, but was variable. June temperatures were below average (decile 1–3), inhibiting crop growth. The Geraldton, Kwinana East and the north and western areas of the Kwinana West zones recorded rainfall at decile 1–3. Crops were moisture stressed, with small rain events insufficient to maintain growth and improve deeper stored soil moisture. In contrast, June rainfall across much of the Albany and Esperance zones was recorded at 8–10 deciles, including a small area with the highest on record for June.

Scattered showers during July amounted to between 10 mm and 25 mm over much of the crop area. Falls at times were insufficient to be effective or provided only short-lived relief to moisture-stressed crops. Monthly rainfall totals increased towards the western edge of the Albany zone. Patchy crops responded quickly towards more average yield prospects. Coastal areas of the Albany and Esperance zones were very wet, with some crops suffering from waterlogging. Crop development in these areas were estimated to be 2–4 weeks behind more typical seasons, raising the concern of increased heat stress risk.

By mid-August, crop prospects varied across the full gamut, from failed crops to those on track for above average yields.

Predictions of warmer than normal temperatures were realised. In the northern areas of the Geraldton zone there was the likelihood of some failed later-sown crops in the, and closer to average yields in earlier sown crops, particularly towards the coast. Crop potential increased progressively southwards in the Kwinana zones, from average crops to above average potential. Throughout the different areas in the Albany zone, crop prospects were average to above average, while the Esperance zone varied widely, with most growers expecting closer to average yields.

Ongoing absence of effective rainfall and widespread decile 10 and new record-breaking average maximum temperatures during September took their toll. Northern

crops quickly matured. Effective rainfall was limited to one event in mid-September, which helped to maintain southern crop potential yields. October had above average hot and dry weather, setting new records for lack of rainfall and above average temperatures.

In summary, it was dry in the north, average in the middle and wet in the south of the state's canola-growing regions. The final estimated production for Western Australia was 2.58 million tonnes from an estimated 1.84 million hectares, averaging 1.40 t/ha.

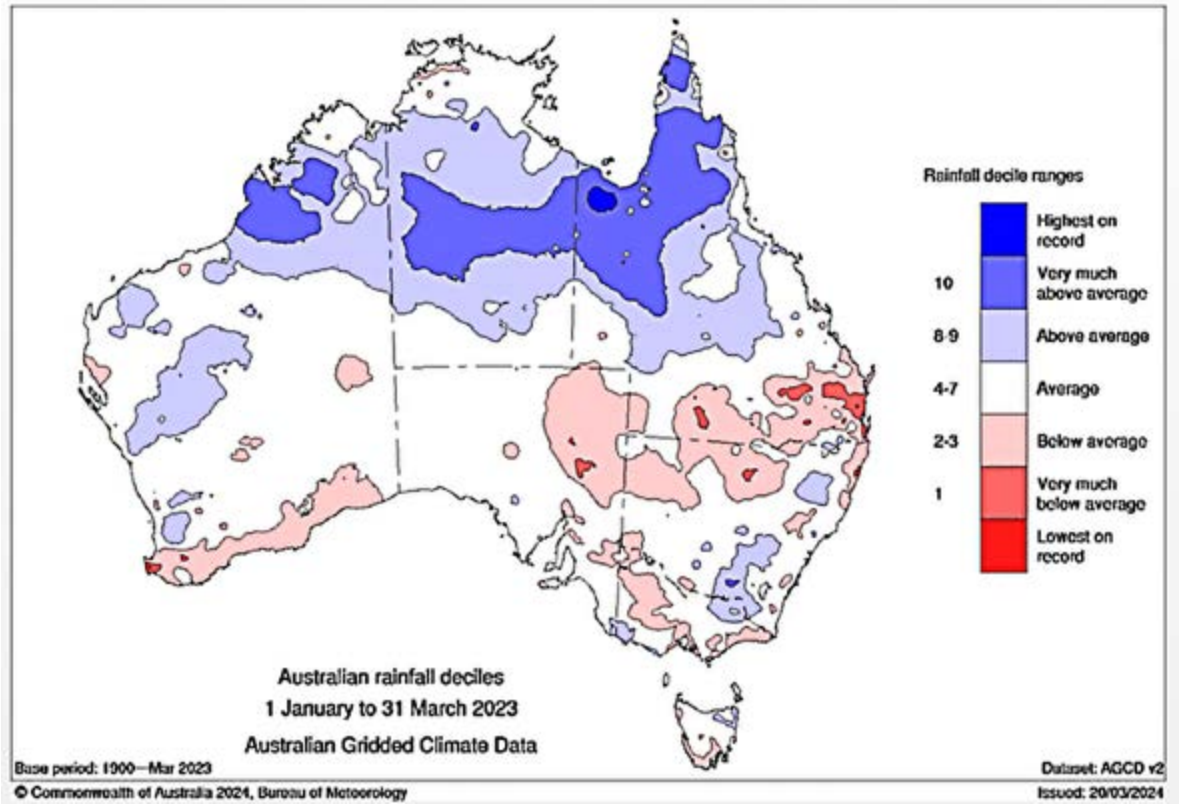

Figure 2. Australian rainfall deciles 1 January to 31 March 2023. (Source: Bureau of Meteorology [BOM]).

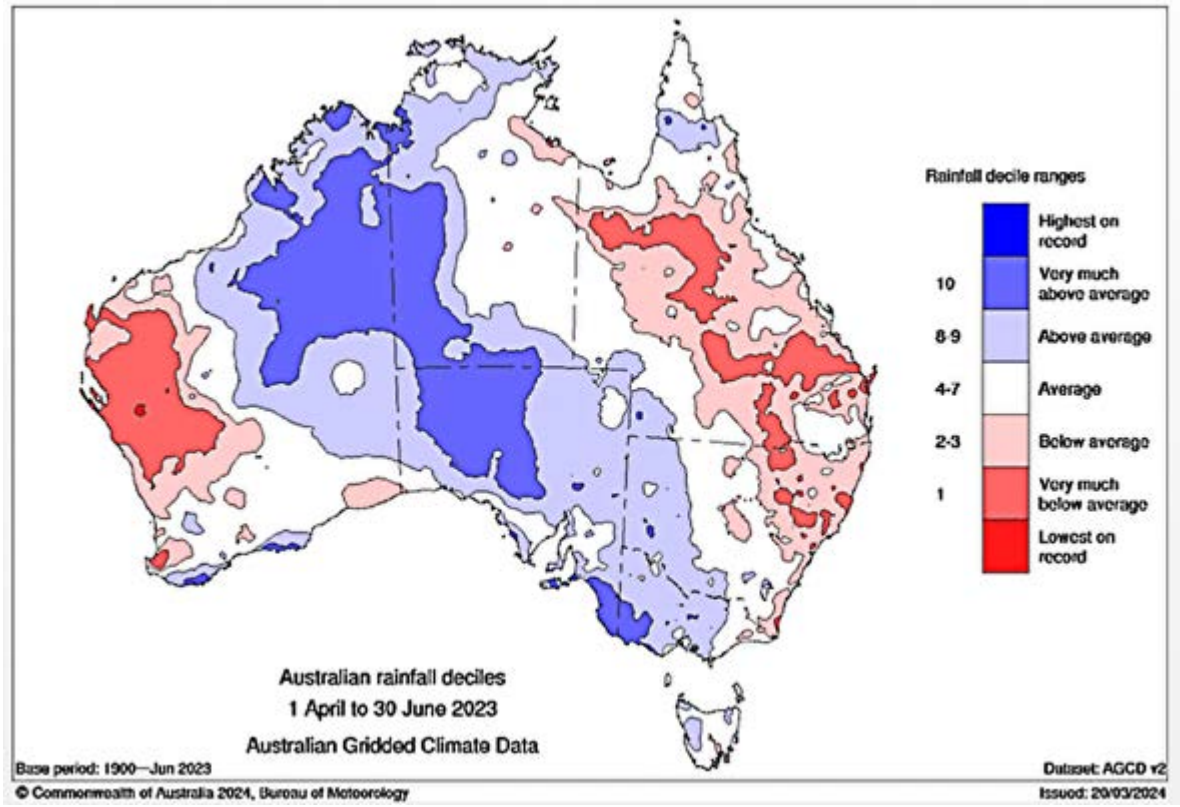

Figure 3. Australian rainfall deciles 1 April to 30 June 2023. (Source: BOM).

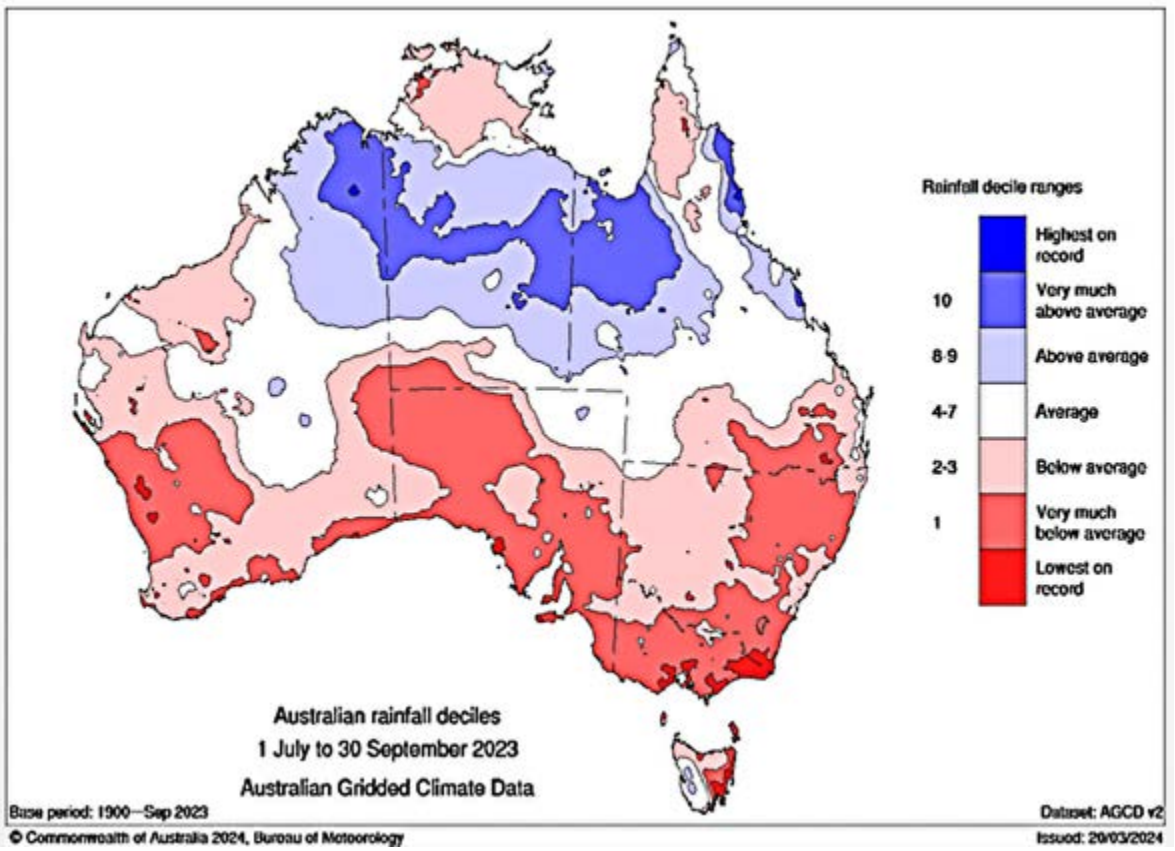

Figure 4. Australian rainfall deciles 1 July to 30 September 2023. (Source: BOM).

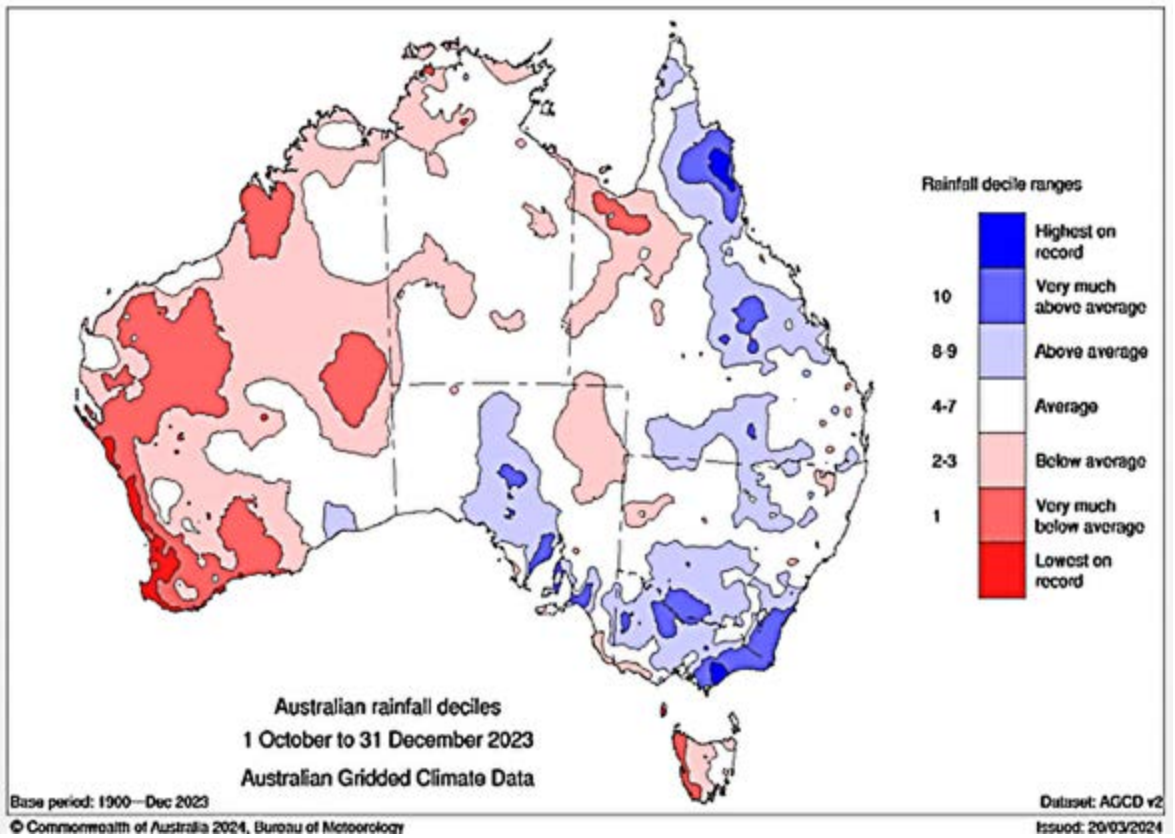

Figure 5. Australian rainfall deciles 1 October to 31 December 2023. (Source: BOM).

Yield

Australia produced an estimated yield of 5.80 million tonnes of canola in 2023 from an estimated harvested area of 3.59 million hectares for an average yield of 1.61 t/ha. Average state yields ranged from 1.40 t/ha in Western Australia to 2.35 t/ha in Victoria.

The national crop area decreased by approximately 6% on the 2022 harvest from 3,841,000 ha to 3,596,000 ha. Canola production nationally also decreased by approximately 2,132,000 tonnes to 5,802,000 tonnes, a reduction of approximately 27% from the 2022 record harvest of 7,934,000 tonnes. Despite the reduced production, the 2023 harvest is the third largest on record. Yield declined to 1.61 t/ha, down from the 2022 yield of 2.07 t/ha. Victoria was the only state that showed an increase in yield, from 2.17 t/ha in 2022 to 2.35 t/ha in 2023. Area sown, production and yield, in each state, is shown in Table 1.

Table 1. Estimated Australian canola production by state in 2023.

State	Area sown (hectares)	Production (tonnes)	Average yield (tonnes/hectare)
New South Wales	866,000	1,340,000	1.55
South Australia	284,000	468,000	1.65
Victoria	601,000	1,410,000	2.35
Western Australia	1,845,000	2,584,000	1.40
Australia	**3,596,000**	**5,802,000**	**1.61**

Source: Australian Oilseeds Federation (AOF), LachStock Consulting.

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Lachstock consulting

https://www.lachstockconsulting.com.au/

AOF

http://www.australianoilseeds.com/

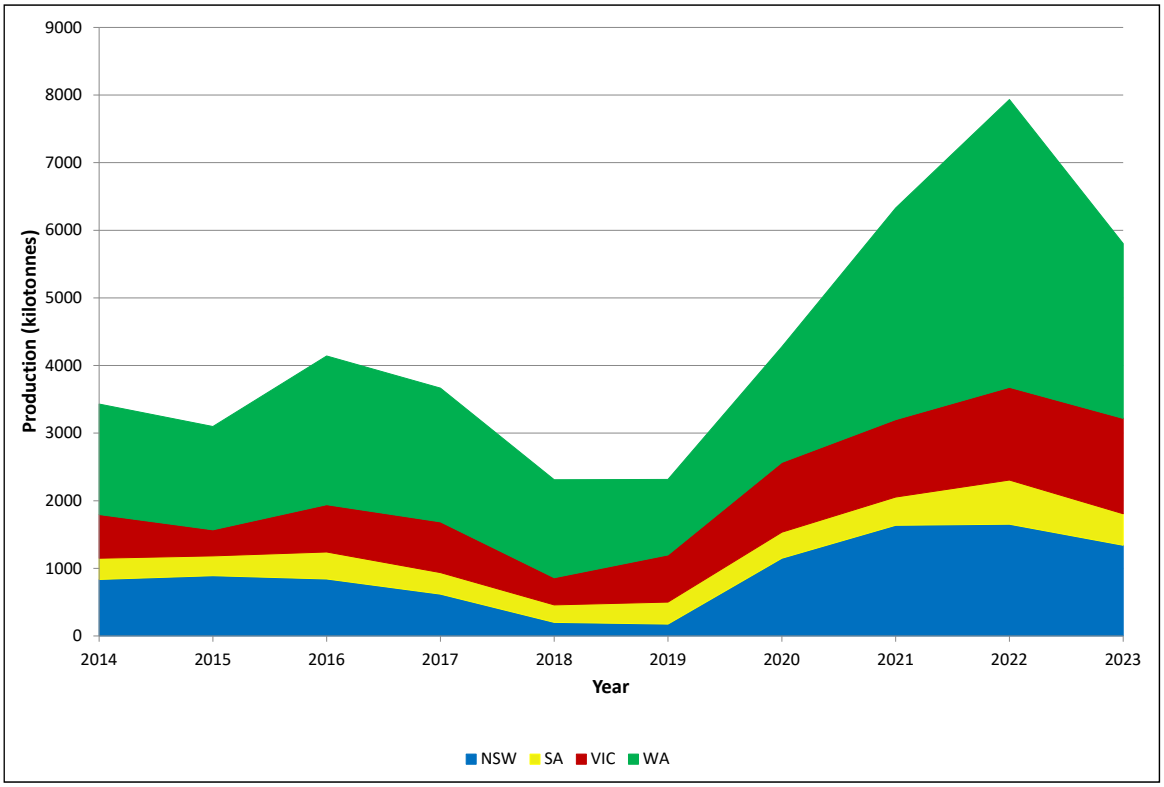
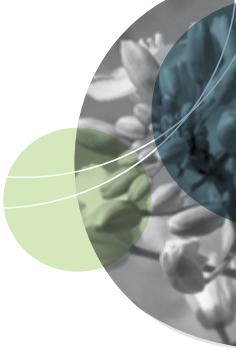


Figure 6. Canola production in Australia 2014–2023.

Australian quality parameter summary



A weighted average of each region and state was calculated based on the tonnages each site and grade represent (Table 2).

The Australian national weighted average was calculated using the production figures for each state.

Due to tonnages being confidential information, individual site tonnages cannot be reported.

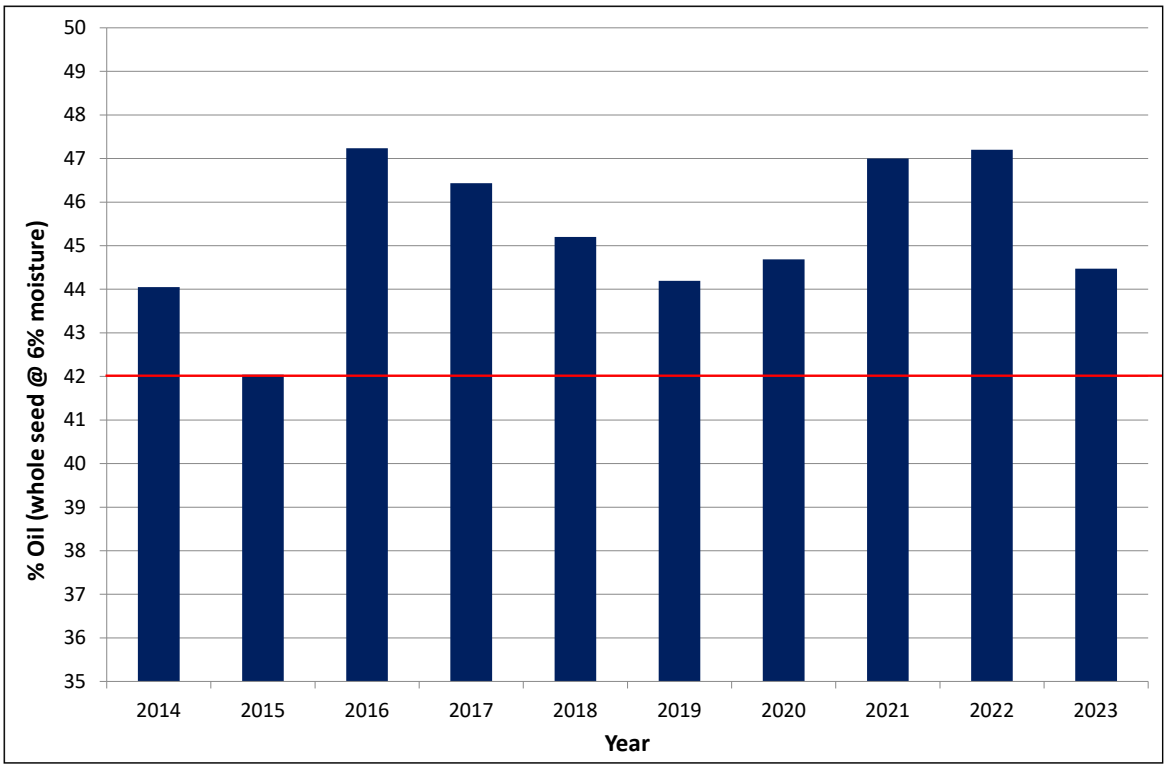
Table 2. Average quality of Australian canola 2023.

Quality parameter	Australian weighted average
Oil content, % in whole seed @ 6% moisture	44.5
Protein content, % in oil-free meal @ 10% moisture	39.6
Glucosinolates, µmoles/g in oil-free meal @ 10% moisture	12
Test weight, kg/hL	67.0
Oleic acid (C18:1), % [1]	61.9
Linoleic acid (C18:2), % [1]	19.2
Linolenic acid (C18:3), % [1]	9.9
Erucic acid (C22:1), % [1]	<0.1
Polyunsaturated fatty acids, % [1]	29.1
Monounsaturated fatty acids, % [1]	63.5
Saturated fatty acids, % [1]	7.4
Iodine value	113.6
Chlorophyll content, mg/kg in whole seed as received	2

[1] Fatty acids are reported as a % of total fatty acids.

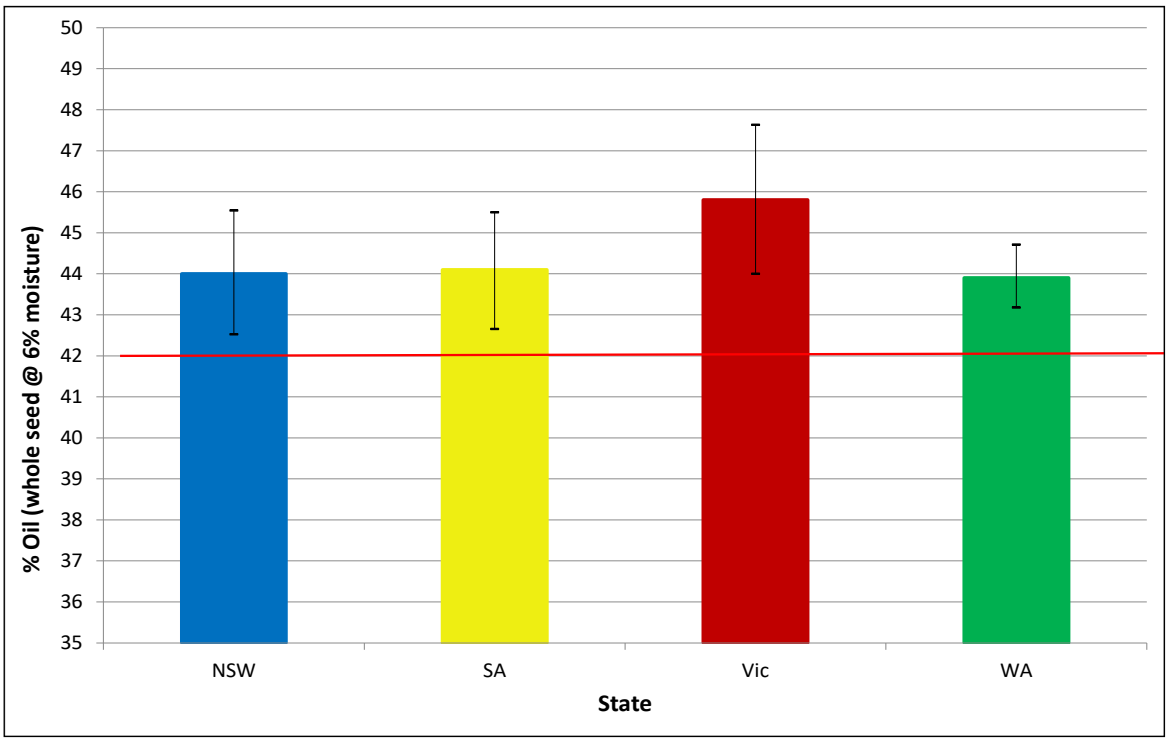
Oil content

The average oil content for the Australian harvest in 2023 was 44.5% This was 2.7 percentage points lower than the 2022 harvest of 47.2%. The receival site oil content ranged from 39.8% at Kimba in South Australia to 50.2% at Berrybank (GM canola) in Victoria. The Western Australian port zone oil content ranged from 43.0% at Albany to 44.8% at Geraldton. Oil content is reported as the percentage in whole seed @ 6% moisture.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.
Red line indicates the AOF base level oil content of 42%.

Figure 7. Average Australian oil content 2014–2023.

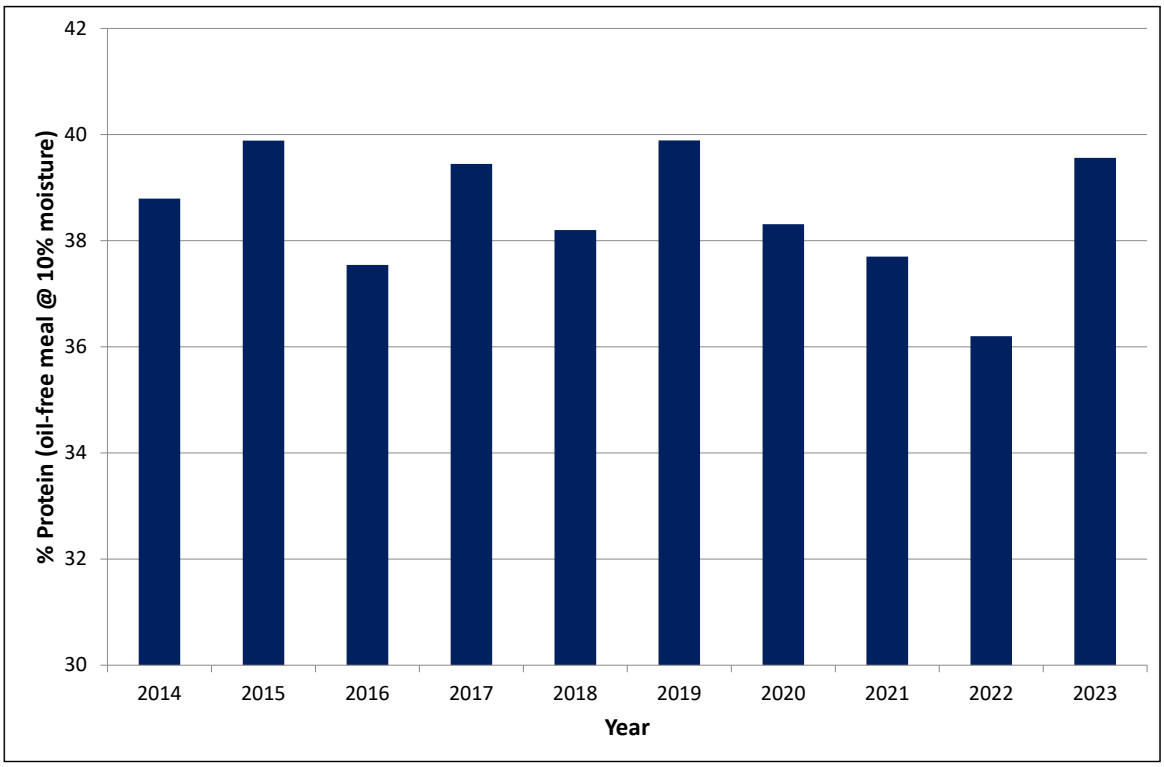


Bars indicate the standard deviation for each state.
Red line indicates the AOF base level oil content of 42%.

Figure 8. Average oil content by state 2023.

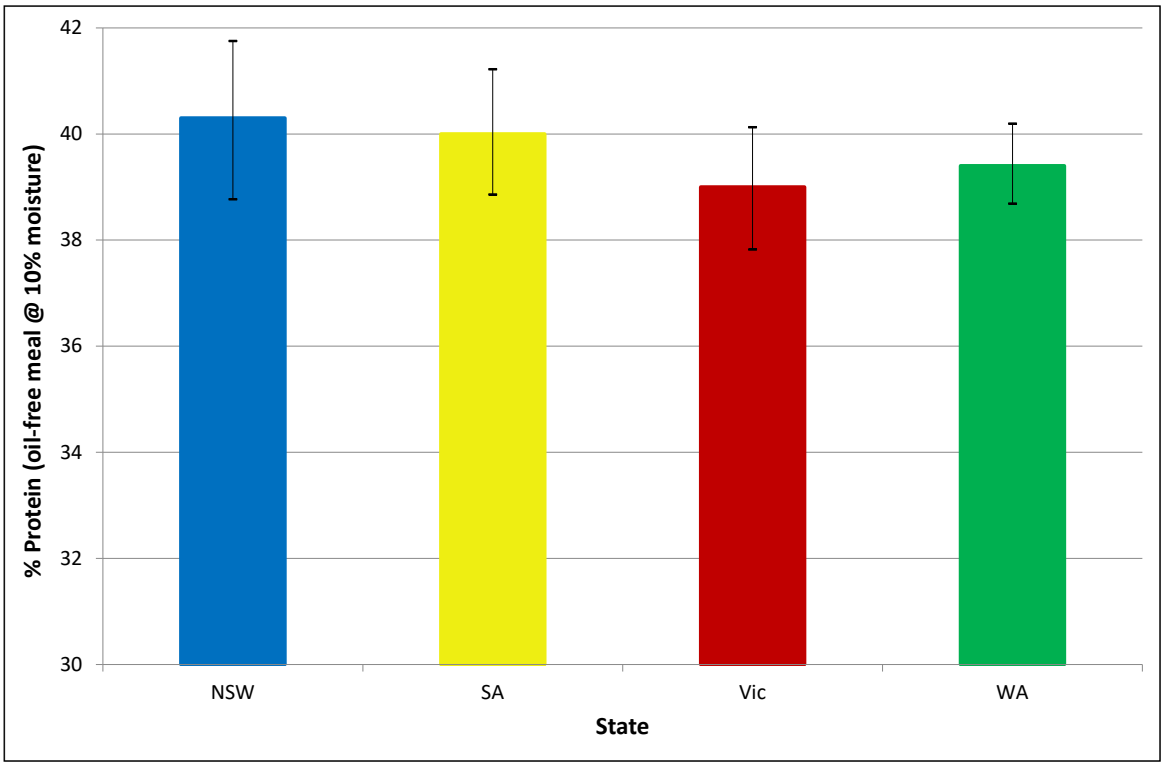
Protein content

The average protein content for the 2023 Australian canola harvest was 39.6%, an increase of 3.4 percentage points from the 2022 harvest of 36.2%. Protein ranged from 36.1% at Westmere (GM canola) in Victoria to 43.2% at Quandialla in New South Wales. The Western Australian port zone protein content ranged from 38.7% at Albany to 40.3% at Geraldton. Protein content is reported as the percentage in oil-free meal @ 10% moisture.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 9. Average Australian protein content 2014–2023.



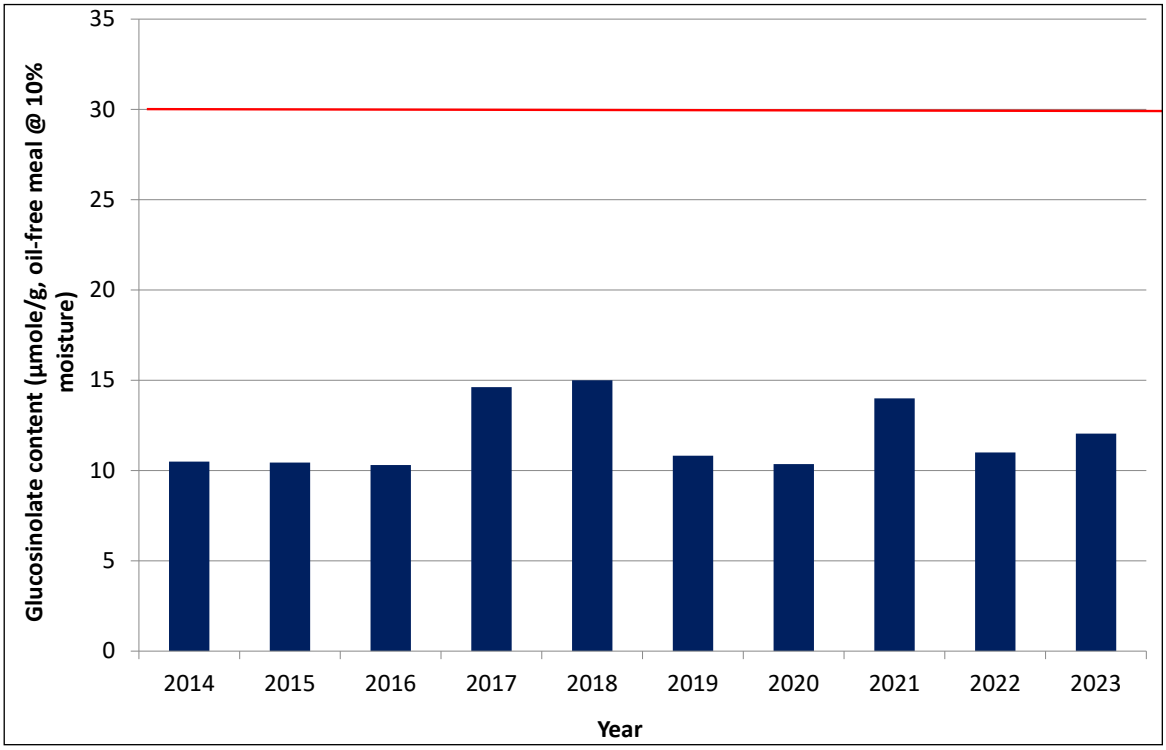
Bars indicate the standard deviation for each state.

Figure 10. Average protein content by state 2023.

Glucosinolate content – meal

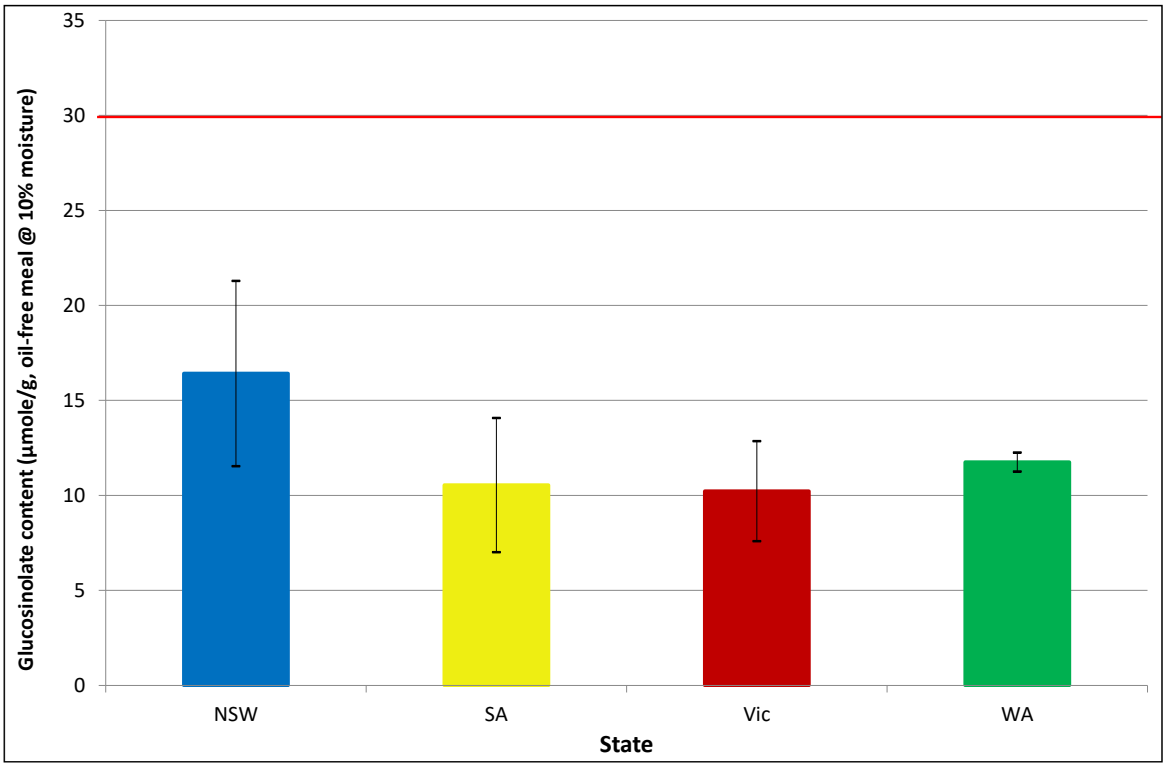
The AOF Trade Standard sets the limit for glucosinolate content at 30 µmoles/g, oil-free meal. Glucosinolate content is reported as µmoles/g, oil-free meal at 10% moisture to allow comparison with the AOF Trade Standard.

The average glucosinolate content for the Australian harvest in 2023 was 12 µmoles/g. This was an increase of 1 µmole/g from the 2022 harvest of 11 µmoles/g. The receival site glucosinolate content ranged from 5 µmoles/g at Oaklands (GM canola) in New South Wales (under GrainCorp's North East region in Victoria) to 26 µmoles/g at Cunningar in New South Wales.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.
Red line indicates the AOF limit of 30 µmoles/g in oil-free meal.

Figure 11. Average Australian glucosinolate content in meal 2014–2023.

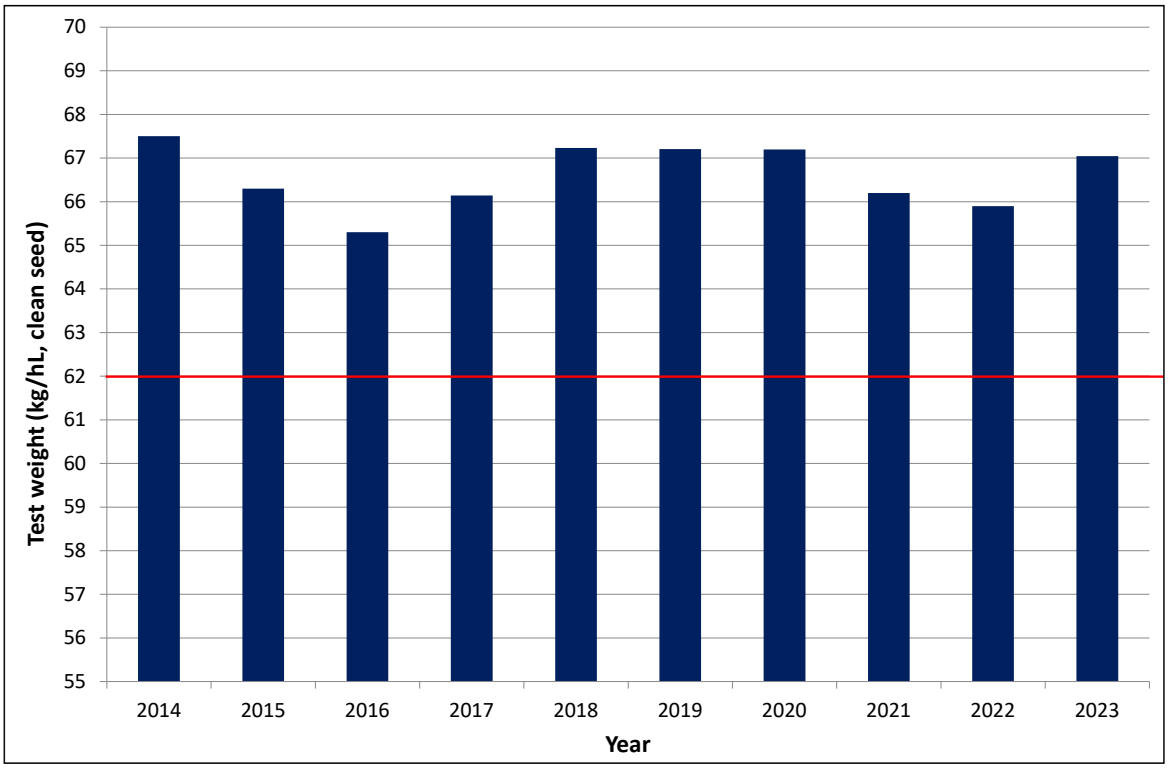


Bars indicate the standard deviation for each state.
Red line indicates the AOF limit of 30 µmoles/g in oil-free meal.

Figure 12. Average glucosinolate content in meal by state 2023.

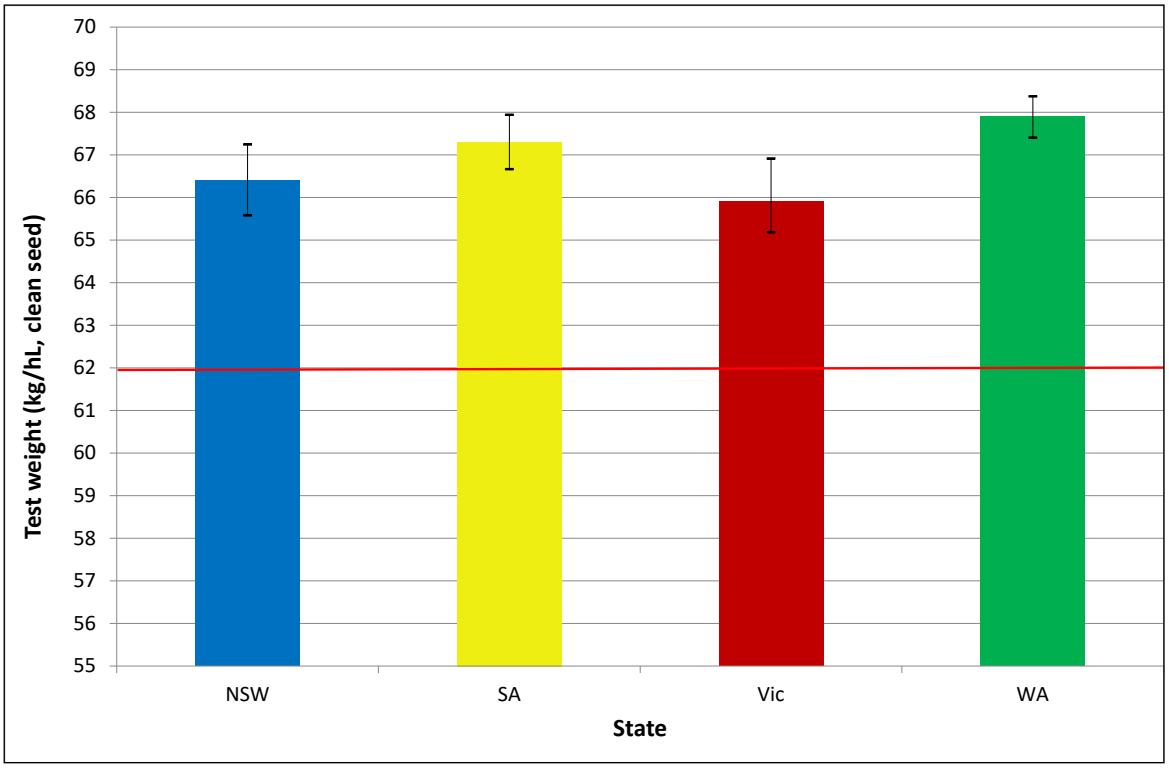
Test weight

The average test weight for the Australian harvest in 2023 was 67.0 kg/hL. This was an increase of 1.1 kg/hL from the 2022 harvest of 65.9 kg/hL. The receival site test weight ranged from 63.5 kg/hL at Westmere in Victoria to 69.0 kg/hL at Kimba in South Australia. Test weight is reported as kg/hL on clean seed.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.
Red line indicates the AOF limit of 62.0 kg/hL.

Figure 13. Average Australian test weight on clean seed 2014–2023.

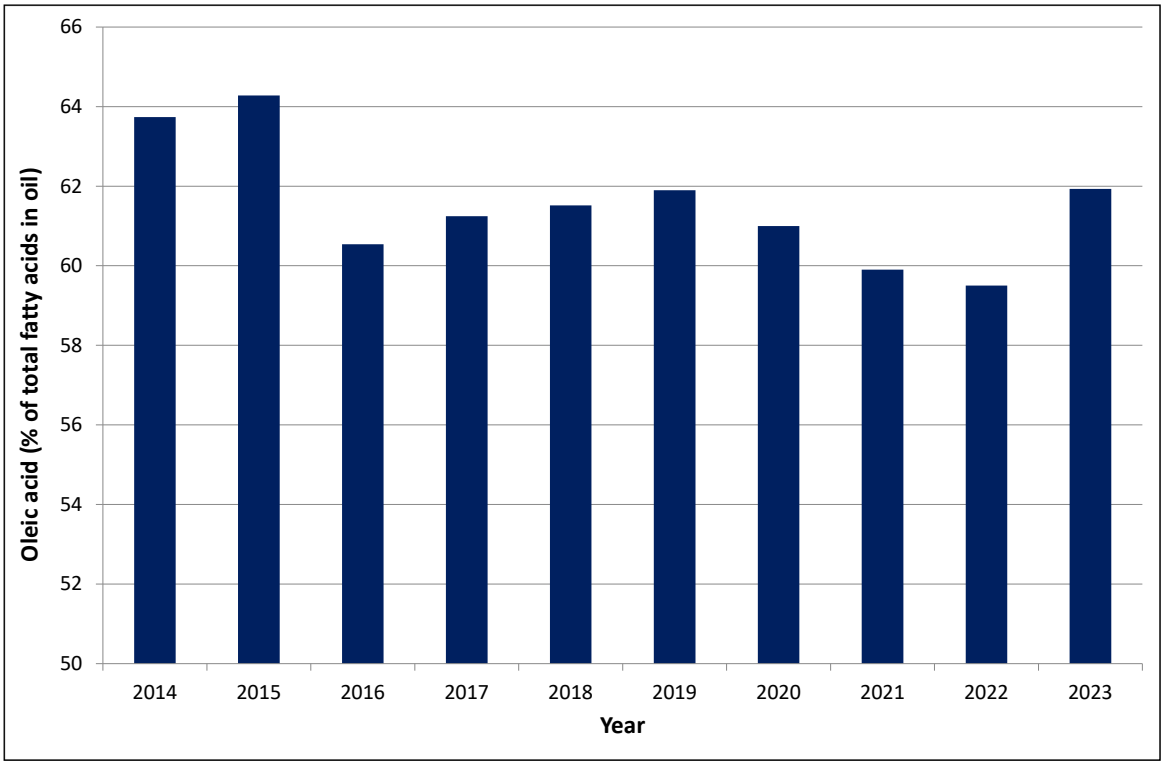


Bars indicate the standard deviation for each state.
Red line indicates the AOF limit of 62.0 kg/hL.

Figure 14. Average test weight on clean seed by state 2023.

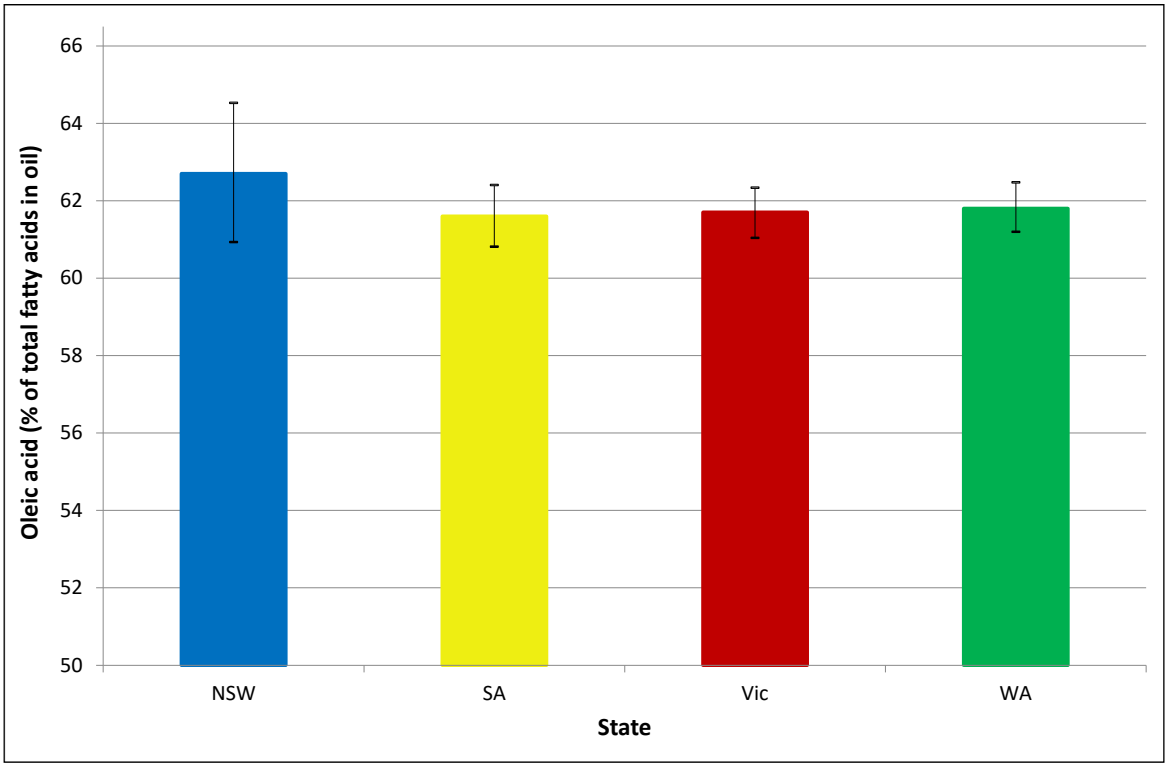
Oleic acid

The average Australian oleic acid (C18:1) content from the 2023 harvest was 61.9%. This was an increase of 2.4 percentage points from the 2022 season of 59.5%. Oleic acid ranged from 59.5% at Bordertown (GM canola) in South Australia to 69.7% at Coleambally in New South Wales. Fatty acids are reported as a percentage of total fatty acids.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 15. Average Australian percentage of oleic acid in canola oil 2014–2023.

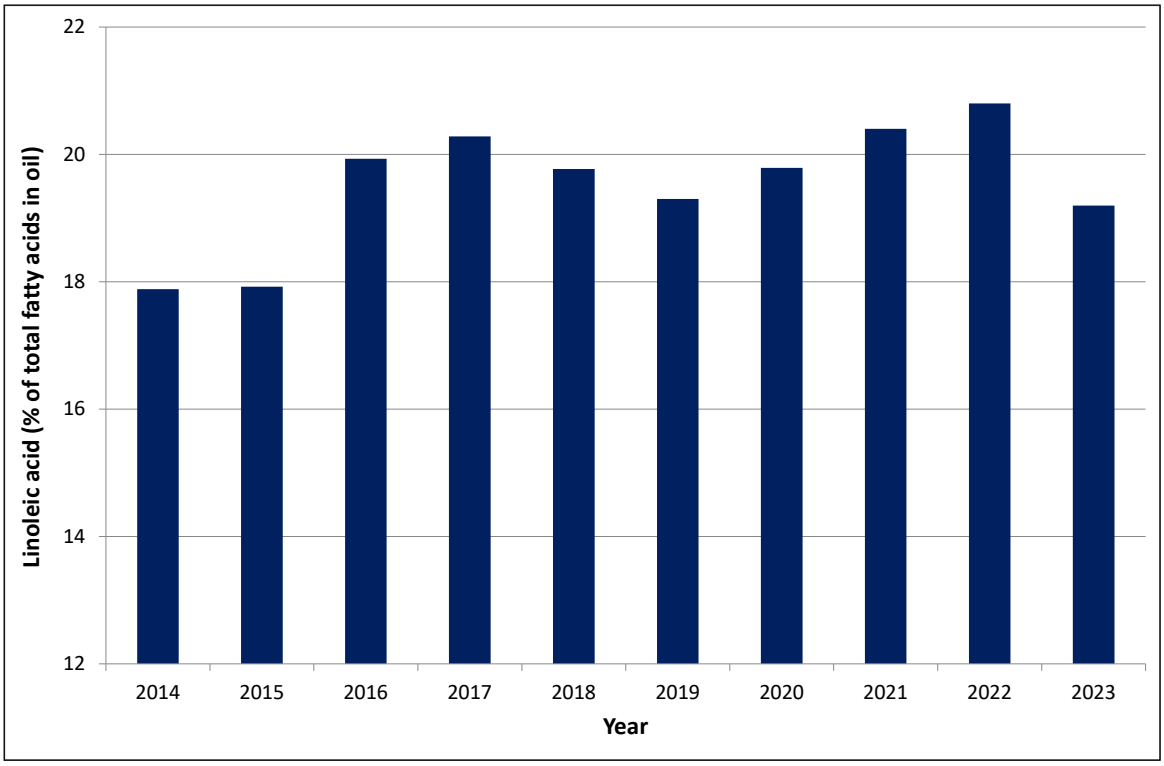


Bars indicate the standard deviation for each state.

Figure 16. Average percentage of oleic acid in canola oil by state 2023.

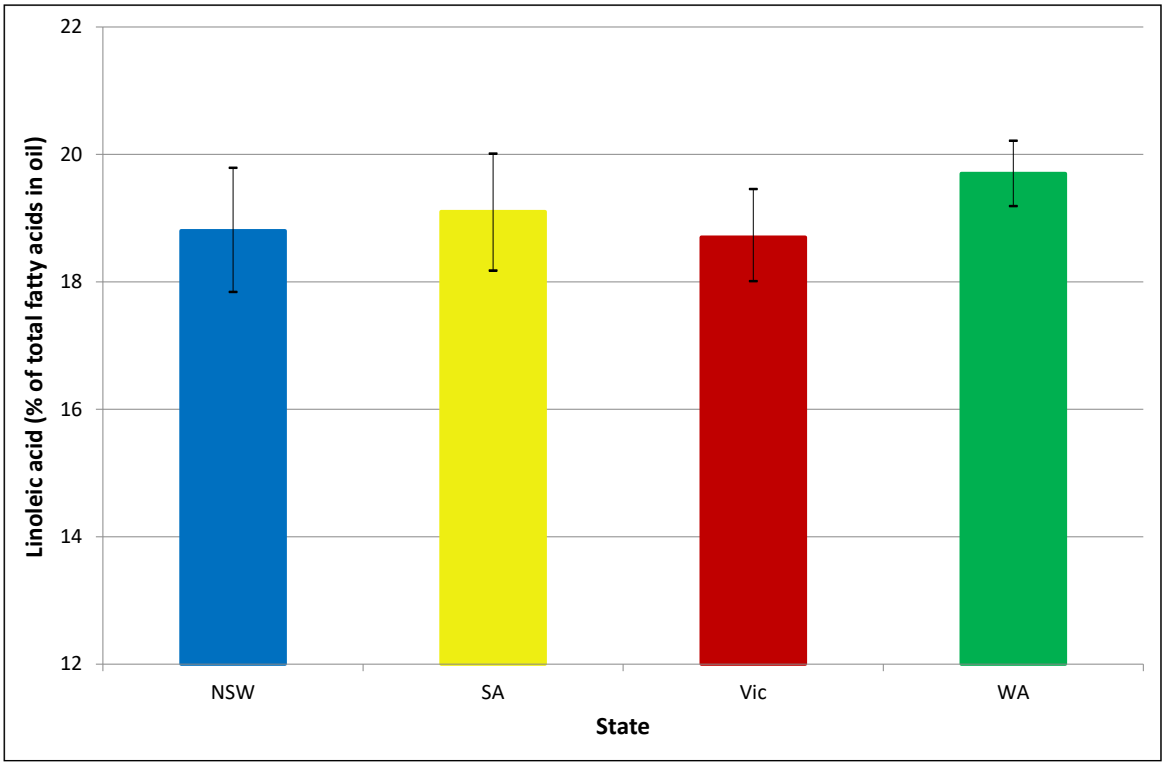
Linoleic acid

The average Australian linoleic acid (C18:2) content from the 2023 harvest was 19.2%. This was a decrease of 1.6 percentage points from the 2022 season of 20.8%. Linoleic acid ranged from 16.5% at Wyalong in New South Wales to 21.2% at Bordertown (GM canola) in South Australia. Fatty acids are reported as a percentage of total fatty acids.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 17. Average Australian percentage of linoleic acid in canola oil 2014–2023.

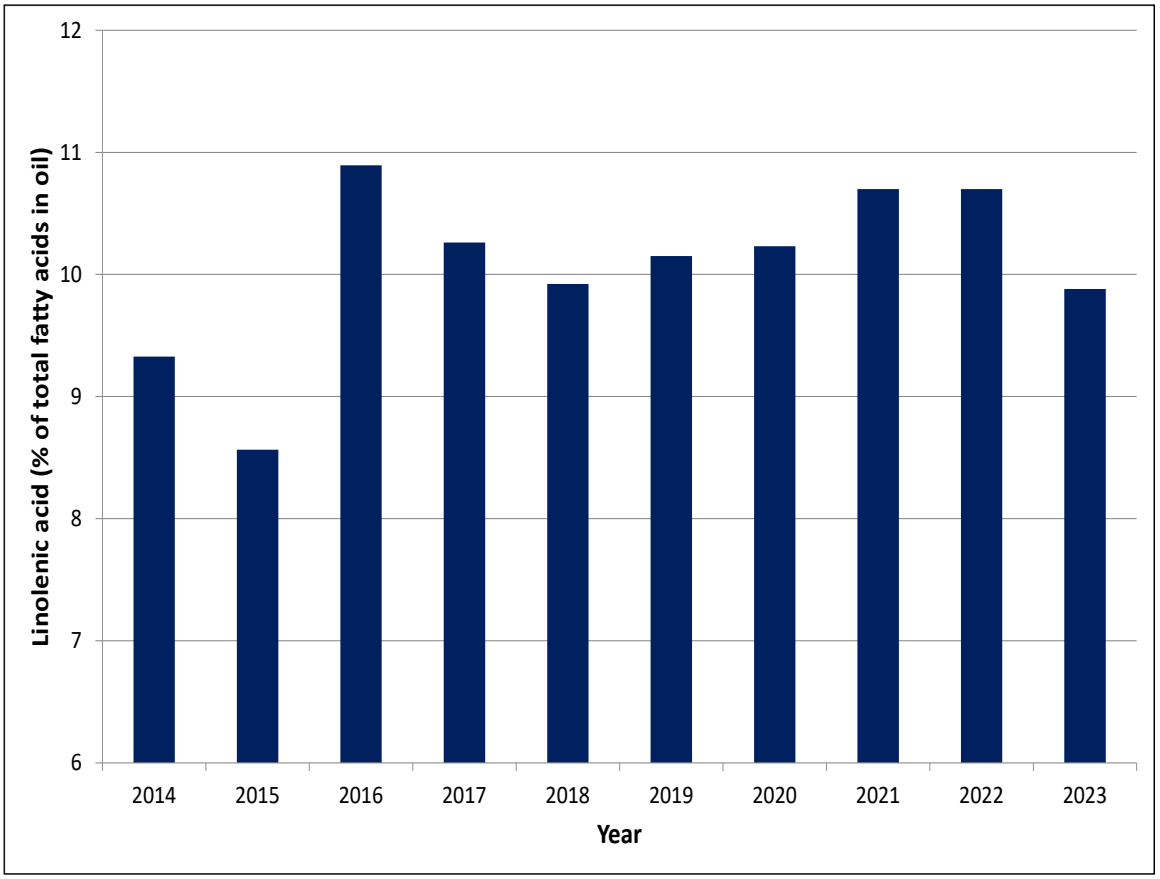


Bars indicate the standard deviation for each state.

Figure 18. Average percentage of linoleic acid in canola oil by state 2023.

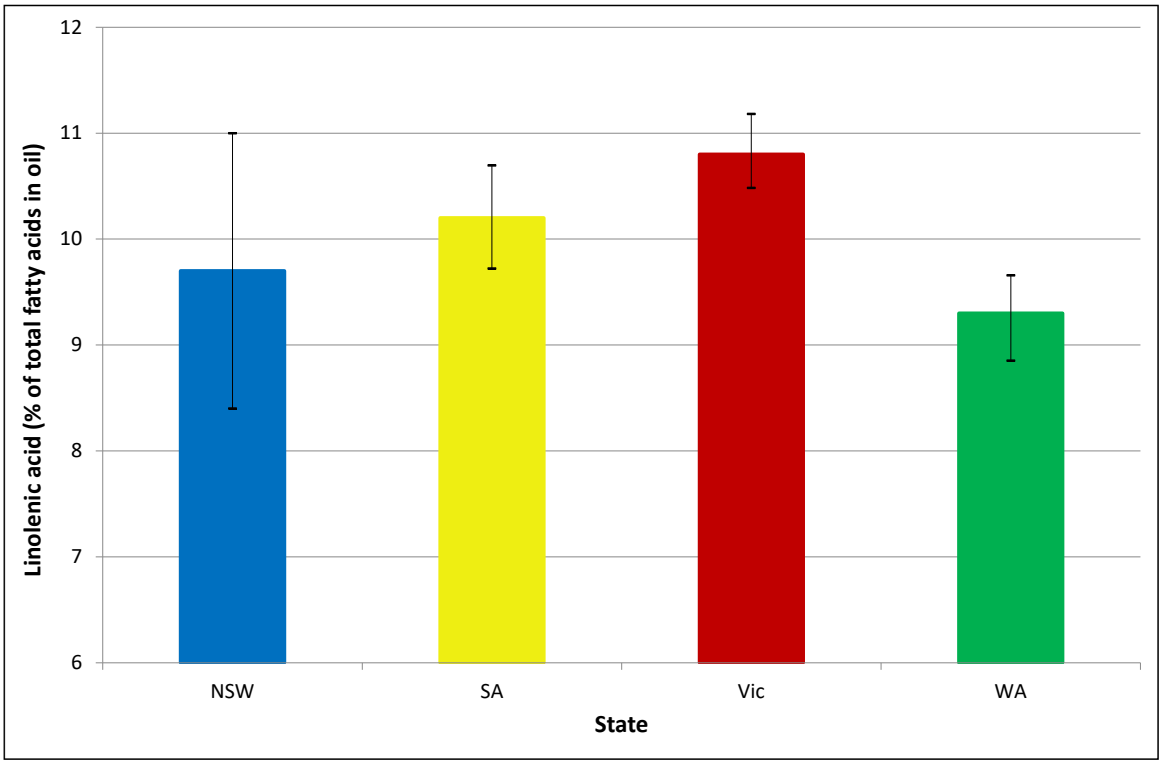
Linolenic acid

The average Australian linolenic acid (C18:3) content from the 2023 harvest was 9.9%. This was a decrease of 0.8 percentage points from the 2022 season of 10.7%. Linolenic acid ranged from 3.1% at Coleambally in New South Wales to 11.7% at Berrybank in Victoria. Fatty acids are reported as a percentage of total fatty acids.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 19. Average Australian percentage of linolenic acid in canola oil 2014–2023.

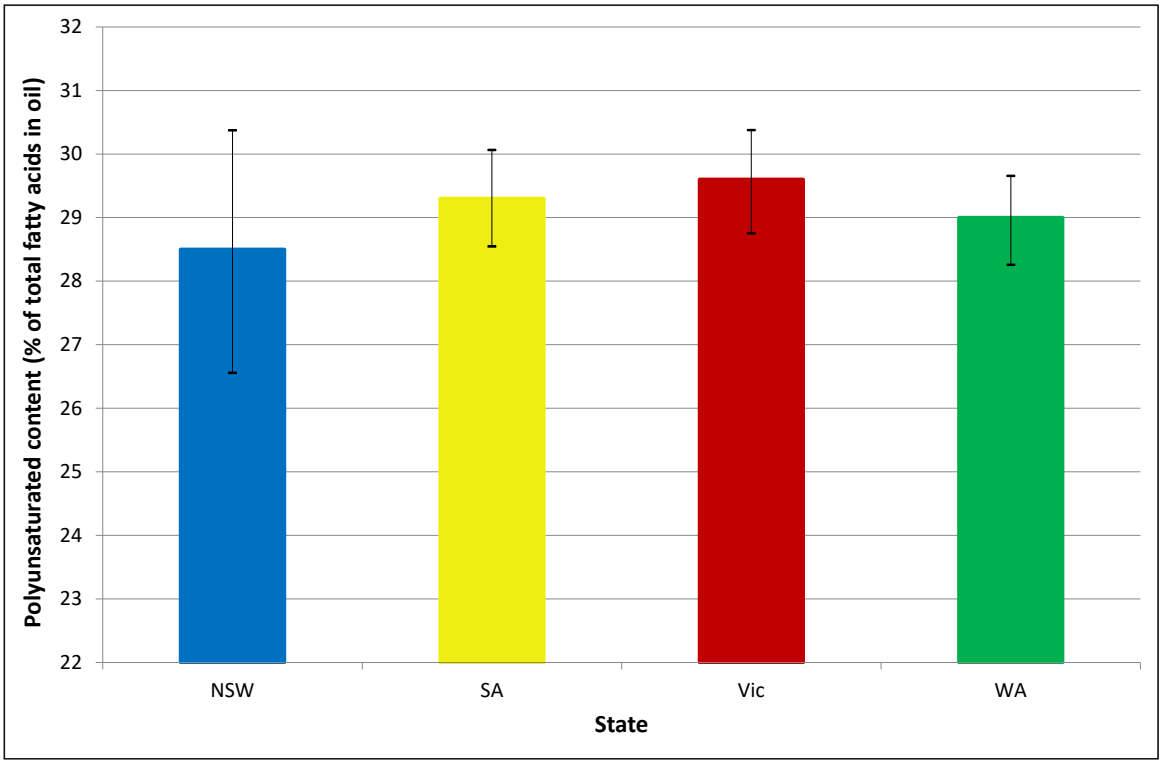


Bars indicate the standard deviation for each state.

Figure 20. Average percentage of linolenic acid in canola oil by state 2022.

Polyunsaturated fatty acids

The average Australian polyunsaturated fatty acids content from the 2023 harvest was 29.1%. This was a decrease of 2.5 percentage points from the 2022 harvest of 31.6%. Polyunsaturated fatty acids ranged from 21.9% at Coleambally in New South Wales to 31.4% at Barnes Crossing in Victoria and Bordertown (GM canola) in South Australia. Fatty acids are reported as a percentage of total fatty acids.

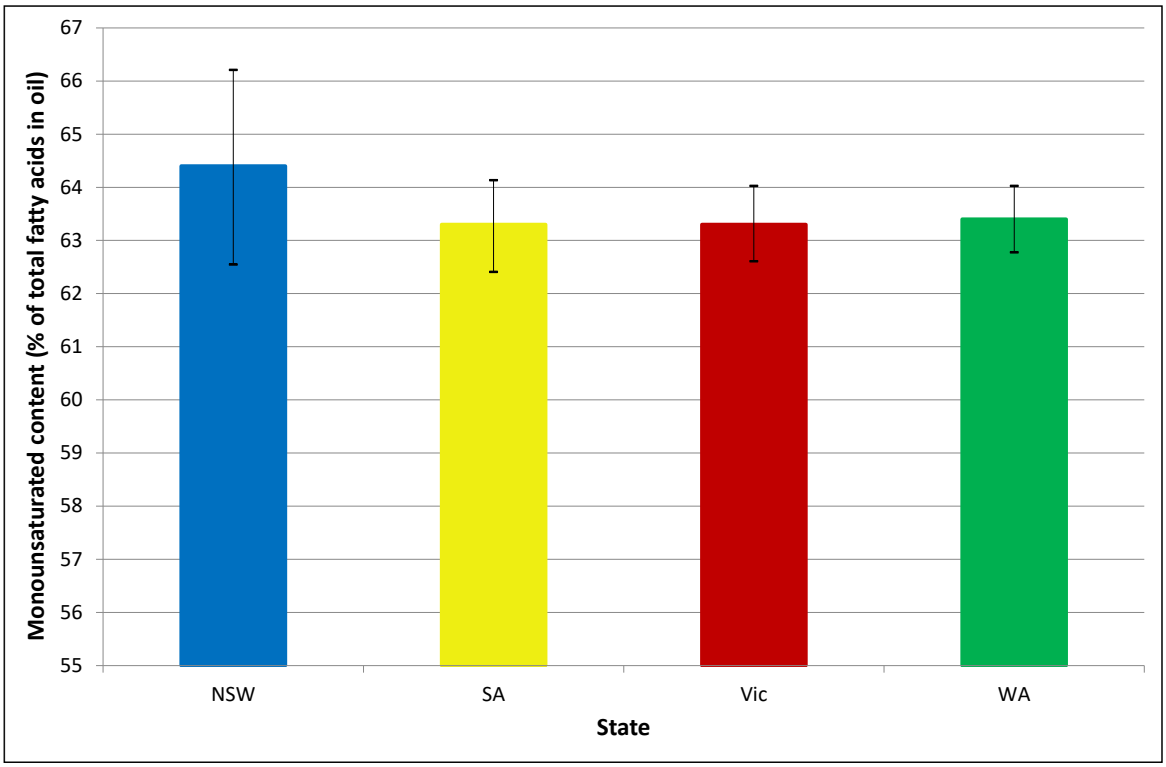


Bars indicate the standard deviation for each state.

Figure 21. Average percentage of polyunsaturated fatty acids in canola oil by state 2023.

Monounsaturated fatty acids

The average Australian monounsaturated fatty acids content from the 2023 harvest was 63.5%. This was an increase of 2.3 percentage points from the 2022 harvest of 61.2%. Monounsaturated fatty acids ranged from 61.0% at Bordertown (GM canola) in South Australia to 71.4% at Coleambally in New South Wales. Fatty acids are reported as a percentage of total fatty acids.

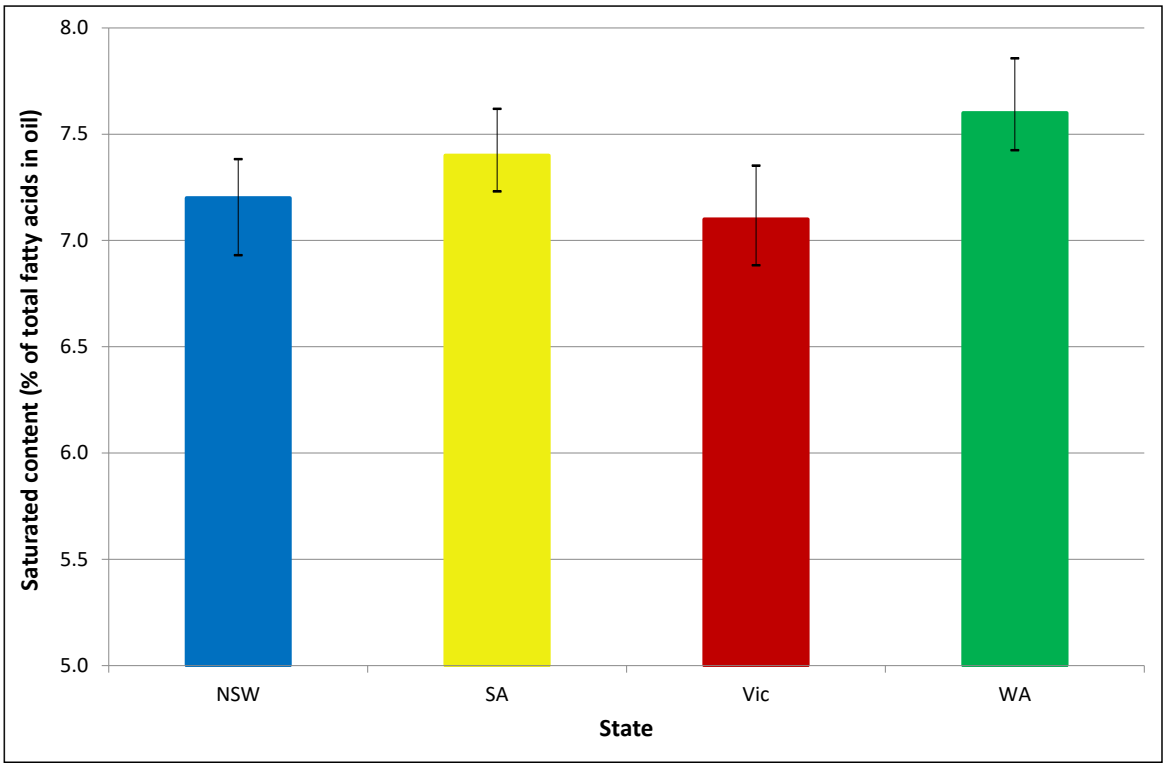


Bars indicate the standard deviation for each state.

Figure 22. Average percentage of monounsaturated fatty acids in canola oil by state 2023.

Saturated fatty acids

The average Australian saturated fatty acids content from the 2023 harvest was 7.4%. This was an increase of 0.2 percentage points from the 2022 season of 7.2%. Saturated fatty acids ranged from 6.6% at Numurkah in Victoria to 7.9% at Port Adelaide in South Australia. Fatty acids are reported as a percentage of total fatty acids.

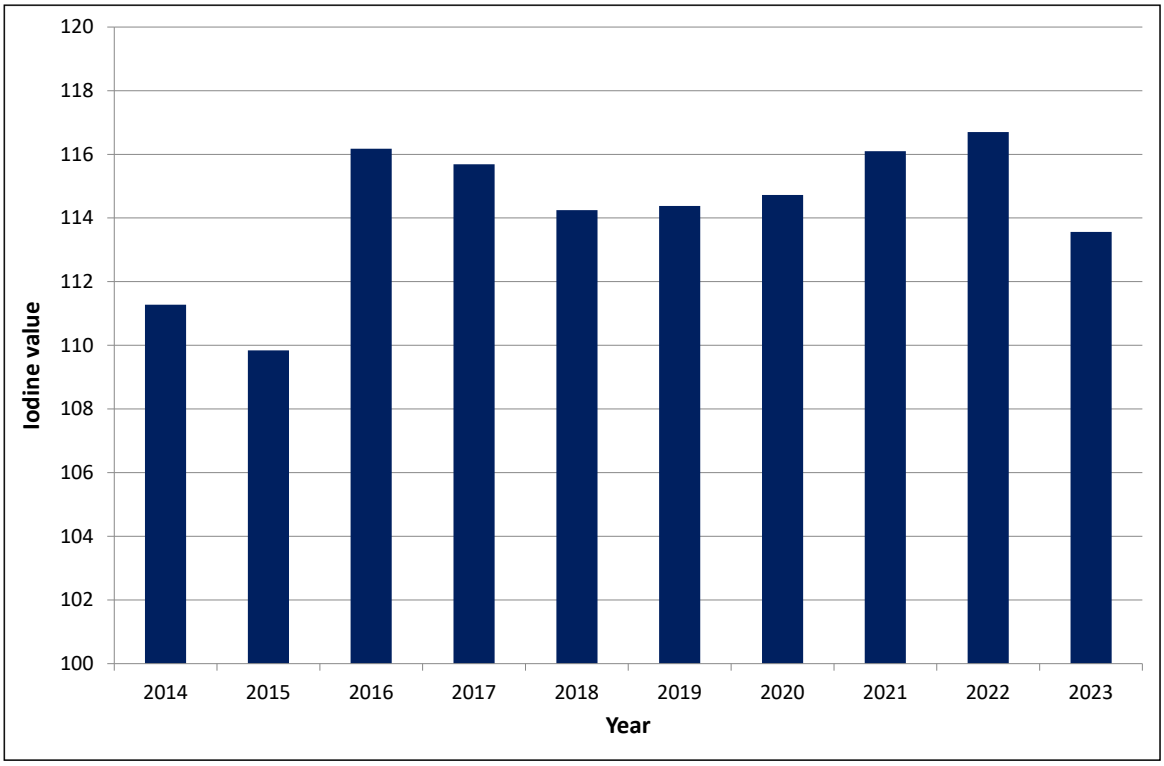


Bars indicate the standard deviation for each state.

Figure 23. Average percentage of saturated fatty acids in canola oil by state 2023.

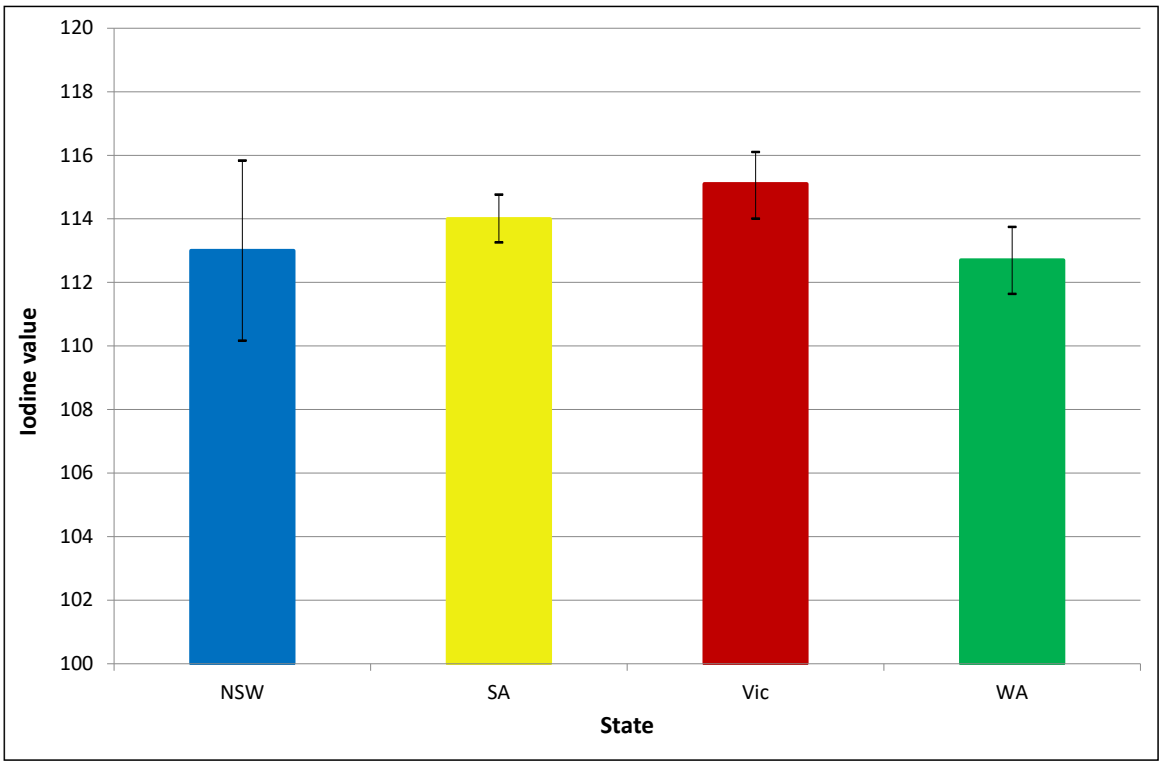
Iodine value

The average Australian iodine value in the oil portion of the seed from the 2023 harvest was 113.6. This was a decrease of 3.1 from the 2022 harvest of 116.7. The iodine value ranged from 101.8 at Coleambally in New South Wales to 117.6 at Barnes Crossing in Victoria.



The 2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 24. Average Australian iodine value in canola oil 2014–2023.



Bars indicate the standard deviation for each state.

Figure 25. Average iodine value in canola oil by state 2023.

Receival sites by state

In each state the bulk handlers group the receival sites into Zones and Regions. Results are reported according to these Zones and Regions.

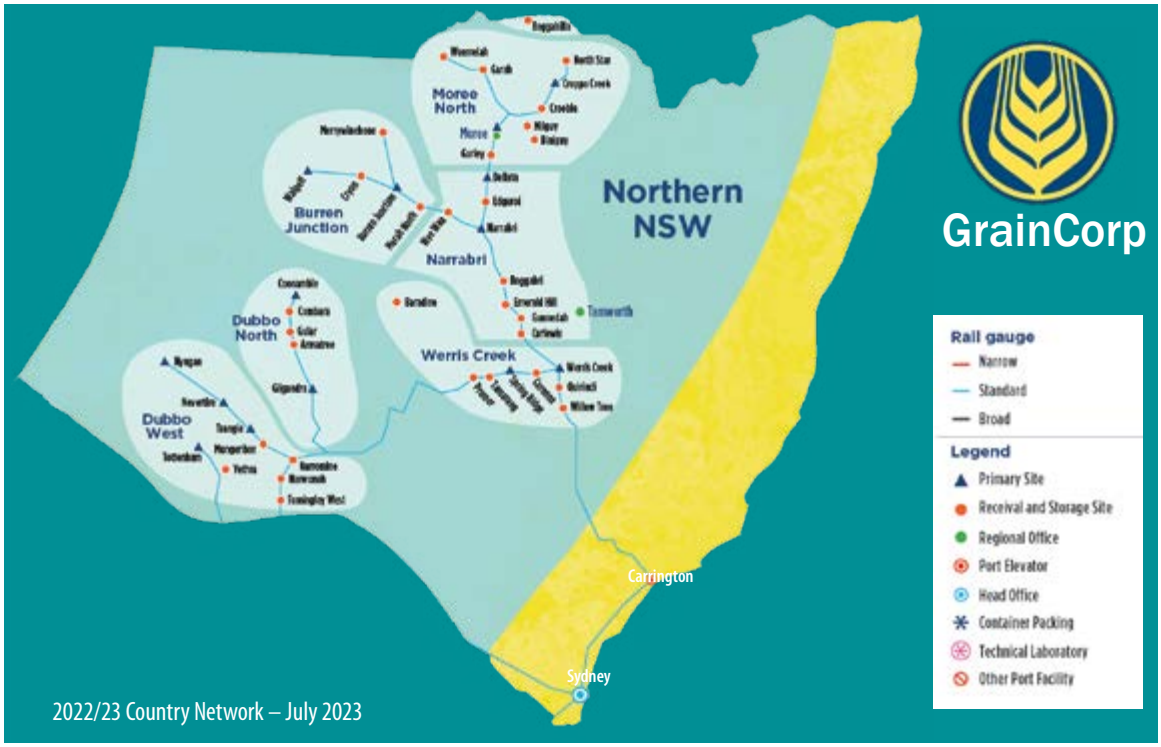


Figure 26. 2022–23 GrainCorp Country Network map of Northern NSW regions. (Source: GrainCorp).

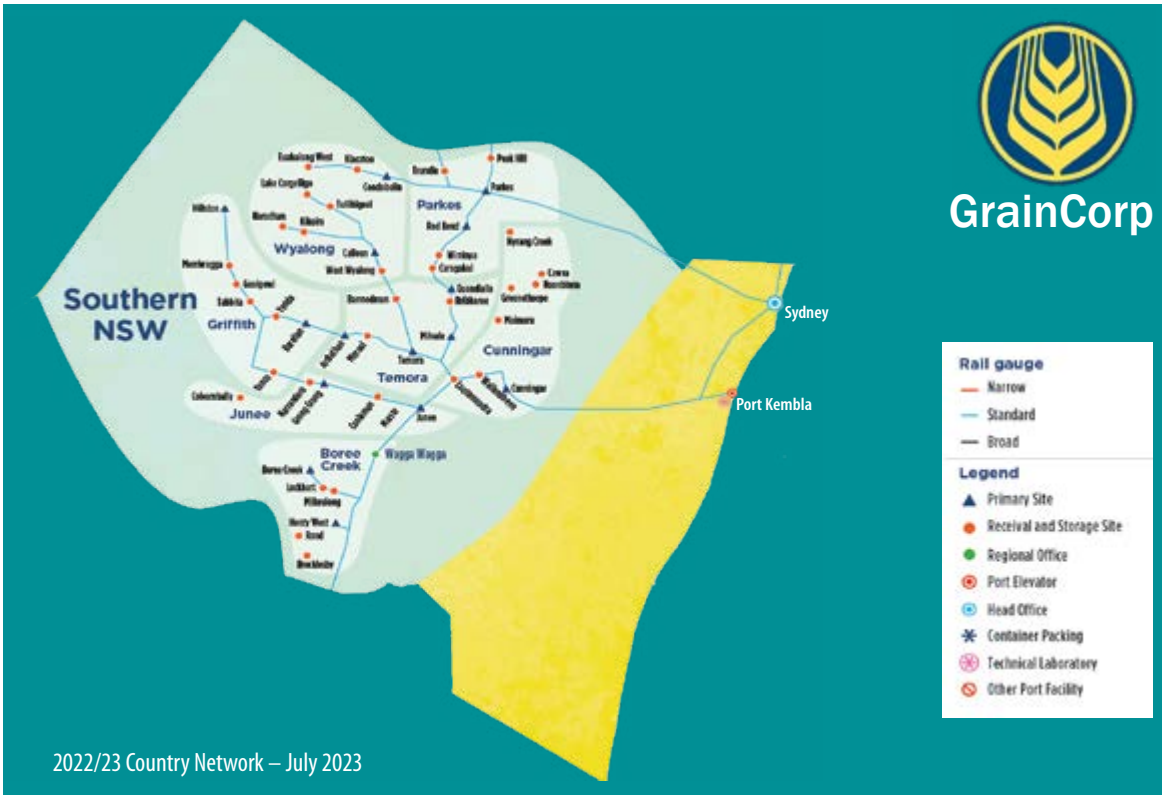


Figure 27. 2022–23 GrainCorp Country Network map of Southern NSW regions. (Source: GrainCorp).

Figure 28. 2022–23 GrainCorp Country Network map of Victorian regions. (Source: GrainCorp).

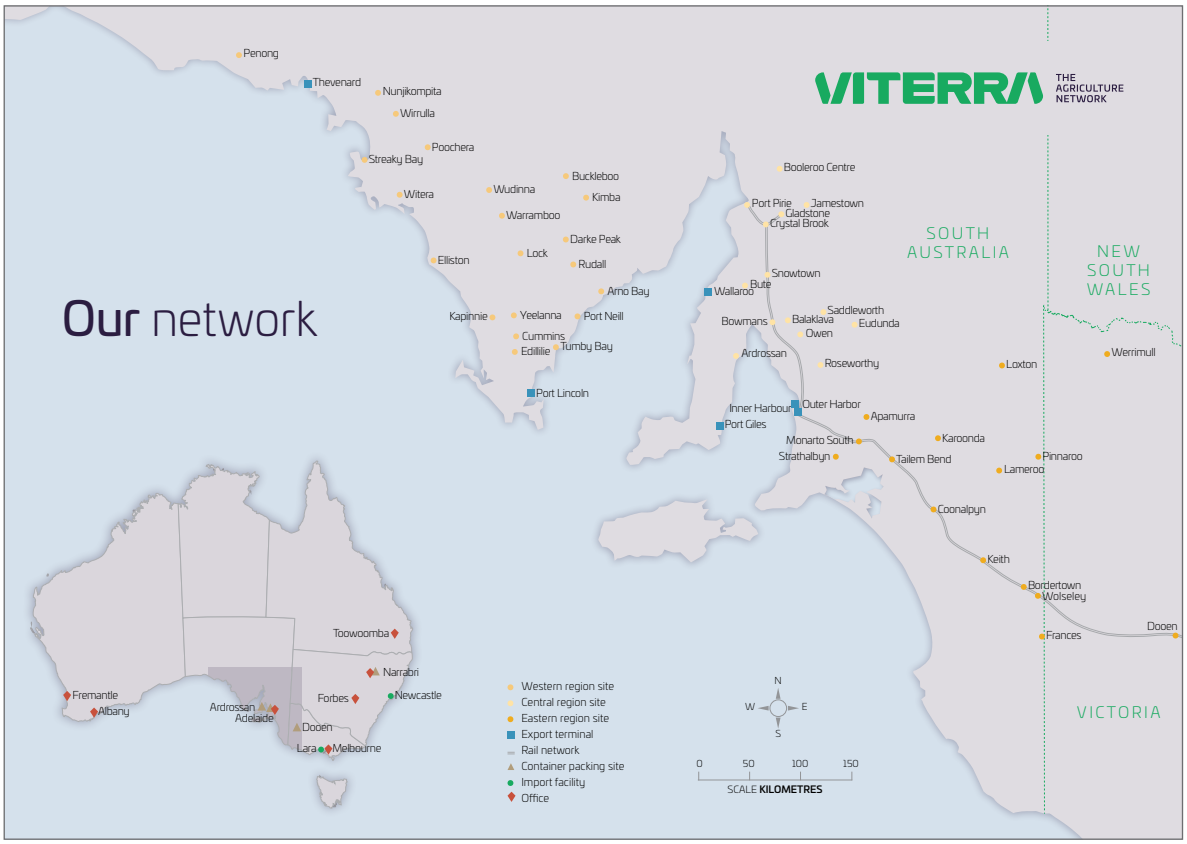


Figure 29. Viterra storage and handling network map. (Source: Viterra).

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GrainCorp (https://grains.graincorp.com.au)

Viterra (https://www.viterra.com.au/)

CBH NETWORK MAP

Receival Sites

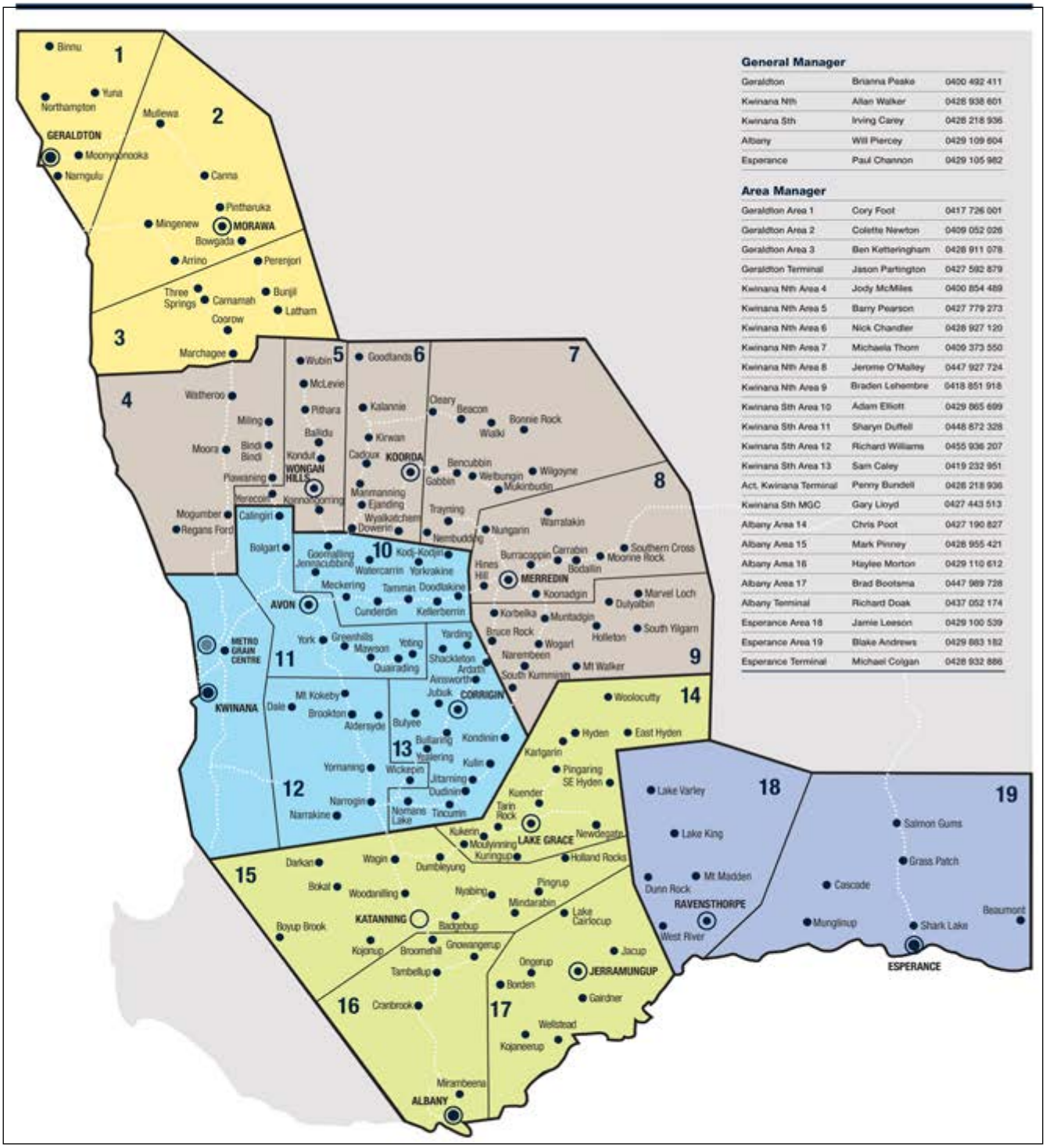

Figure 30. CBH receival sites network map. (Source: CBH Group)

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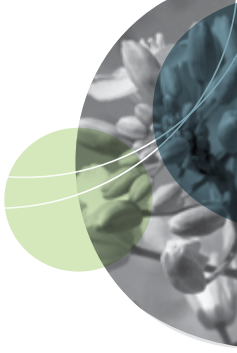
CBH Group
(https://www.cbh.com.au/)



Quality data by state

Table 3. Quality data – New South Wales.

Region	Zone	Site	Grade	Oil	Protein	Glucosinolates	Test weight
				%[1]	%[2]	µmoles/g[3]	kg/hL[4]
Queensland	Goondiwindi	Goondiwindi	CAN	41.6	40.2	12	67.5
Northern NSW	Dubbo North	Coonamble	CAN	41.8	40.8	9	67.4
		Gilgandra	CAN	42.3	40.9	15	67.0
	Dubbo West	Nevertire	CAN	42.7	41.3	15	67.3
		Trangie	CAN	41.8	41.8	17	67.1
	Moree North	Croppa Creek	CAN	42.7	40.9	10	66.6
		Moree	CAN	42.8	40.3	11	67.0
	Narrabri	Bellata	CAN	41.4	41.8	12	67.5
		Boggabri	CAN	40.8	40.3	8	67.6
		Gunnedah	CAN	42.7	39.4	7	66.8
		Narrabri	CAN	41.0	41.3	8	67.6
	Werris Creek	Premer	CAN	42.2	40.3	13	67.0
		Spring Ridge	CAN	43.3	42.2	13	64.3
		Werris Creek	CAN	43.1	40.5	8	66.8
		Willow Tree	CAN	43.7	40.9	11	66.5
Northern NSW weighted average[5]				42.3	40.9	12	67.0
Southern NSW	Boree Creek	Boree Creek	CAN	45.2	38.0	17	66.0
		Henty West	CAN	46.1	38.7	10	66.1
		Milbrulong	CAN	45.7	39.9	9	65.5
		Rand	CAN	45.6	40.2	15	65.5
	Cunningar	Cootamundra	CAN	45.1	39.5	10	65.9
		Cowra	CAN	45.3	38.9	24	65.3
		Cunningar	CAN	45.8	36.4	26	64.8
		Greenthorpe	CAN	46.2	37.7	20	66.4
		Maimuru	CAN	45.0	39.2	21	66.5
	Griffith	Barellan	CAN	43.4	42.8	20	67.1
		Hillston	CAN	42.3	40.8	11	67.5
		Merriwagga	CAN	41.2	42.2	8	67.9
		Tabbita	CAN	42.3	41.2	14	67.5
	Junee	Coleambally	CAN	45.2	43.1	18	66.0
		Coolamon	CAN	43.7	41.6	12	67.0
		Grong Grong	CAN	42.9	40.7	15	67.0
		Junee Sub	CAN	45.9	37.7	24	65.0
		Narrandera	CAN	44.1	40.3	12	66.0
	Parkes	Caragabal	CAN	43.0	41.6	13	66.9
		Parkes Sub	CAN	43.9	41.1	19	65.6
		Red Bend	CAN	44.2	42.5	14	66.5
		Trundle	CAN	42.9	40.8	15	67.3
	Temora	Ardlethan	CAN	42.2	41.7	15	67.5
		Bribbaree	CAN	44.9	40.7	13	66.1
		Milvale	CAN	45.5	38.1	24	66.3
		Quandialla	CAN	43.7	43.2	15	66.8
		Temora Sub	CAN	44.3	41.4	21	66.3
	Wyalong	Calleen	CAN	43.1	39.6	14	67.0
		Condobolin	CAN	43.8	41.2	16	67.5
		Wyalong	CAN	42.8	41.8	20	67.0
Southern NSW weighted average				44.4	40.1	17	66.3
NSW weighted average[5]				44.0	40.3	16	66.4
NSW minimum[5]				40.8	36.4	7	64.3
NSW maximum[5]				46.2	43.2	26	67.9

[1] % in whole seed @ 6% moisture.
[2] % in oil-free meal @ 10% moisture.
[3] µmoles/g in oil-free meal @ 10% moisture.
[4] kilograms/ hectolitre.
[5] Includes data from one site in southern Queensland.

Table 4. Quality data – South Australia.

Zone	Site	Grade	Oil % [1]	Protein % [2]	Glucosinolates µmoles/g [3]	Test weight kg/hL [4]
Adelaide	Port Adelaide	CANO	43.8	39.8	12	66.8
	Port Adelaide	CAGM	43.6	41.6	13	67.5
Central	Ardrossan	CAGM	45.1	40.8	14	67.8
	Bowmans	CANO	43.5	39.6	8	67.3
	Gladstone	CANO	42.0	41.4	9	67.9
	Owen	CAGM	42.3	42.4	21	68.5
	Port Giles	CANO	43.7	40.3	6	67.3
	Port Pirie	CAGM	44.4	40.9	11	67.8
	Roseworthy	CANO	44.7	39.4	11	66.8
	Roseworthy	CAGM	44.8	40.7	15	67.3
Eastern	Bordertown	CAGM	45.7	39.6	9	67.0
	Coonalpyn	CAGM	44.0	41.3	18	67.8
	Dooen	CANO	45.4	38.4	9	66.5
	Frances	CANO	46.1	37.6	9	66.5
	Keith	CANO	43.6	38.6	8	67.0
	Tailem Bend	CANO	43.9	39.9	9	66.9
	Wolseley	CANO	44.2	39.8	8	67.1
Western	Arno Bay	CANO	41.7	41.8	9	68.5
	Cummins	CANO	43.6	39.5	11	67.5
	Cummins	CAGM	44.8	40.3	15	67.6
	Edillilie	CAGM	45.9	40.0	13	67.4
	Kimba	CANO	39.8	42.0	11	69.0
	Port Lincoln	CANO	43.9	39.2	7	67.0
	Port Neill	CANO	43.3	39.8	14	67.6
	Rudall	CAGM	42.2	41.5	15	68.5
	Tumby Bay	CAGM	44.7	41.2	11	67.8
SA weighted average			**44.1**	**40.0**	**11**	**67.3**
SA minimum			**39.8**	**37.6**	**6**	**66.5**
SA maximum			**46.1**	**42.4**	**21**	**69.0**

[1] % in whole seed @ 6% moisture.
[2] % in oil-free meal @ 10% moisture.
[3] µmoles/g in oil-free meal @ 10% moisture.
[4] kilograms/ hectolitre.

Table 5. Quality data – Victoria.

Zone	Site	Grade	Oil % ❶	Protein % ❷	Glucosinolates µmoles/g ❸	Test weight kg/hL ❹
Port Zone	Geelong	CAN	46.3	39.2	13	64.6
Central Victoria	Berrybank	CAN	47.3	38.4	9	65.1
	Berrybank	CANG	50.2	38.2	9	64.5
	Dunolly	CAN	45.1	39.3	15	66.3
	Elmore	CAN	46.2	38.8	12	66.5
	Mitiamo	CAN	45.1	40.7	13	66.5
	Murchison East	CAN	47.1	38.2	7	65.9
	Tandarra	CAN	44.9	40.3	14	66.4
	Westmere	CAN	48.4	36.4	11	63.5
	Westmere	CANG	49.8	36.1	10	63.9
	Willaura	CAN	46.4	38.0	9	65.3
North east	Barnes Crossing	CAN	45.7	39.2	10	66.4
	Deniliquin	CAN	45.9	39.3	13	66.0
	Dookie	CAN	46.9	38.2	11	65.3
	Numurkah	CAN	46.3	38.6	11	66.0
	Numurkah	CANG	47.9	37.9	11	65.5
	Oaklands	CAN	45.5	39.6	9	66.0
	Oaklands	CANG	48.9	38.6	5	65.8
	Tocumwal	CAN	45.2	40.3	13	66.1
	Yarrawonga	CAN	47.3	38.5	13	65.4
Southern Mallee	Beulah	CAN	42.7	41.1	6	67.1
	Charlton	CAN	45.3	39.5	13	66.3
	Donald	CAN	44.1	39.9	12	66.5
	Hopetoun	CAN	42.6	41.3	6	67.3
	Rainbow	CAN	43.3	39.9	9	67.0
	Warracknabeal	CAN	44.4	39.4	8	66.5
	Wycheproof	CAN	44.5	40.4	13	66.8
Swan Hill	Boort	CAN	45.4	39.4	12	66.0
	Piangil	CAN	44.2	38.9	10	66.3
	Quambatook	CAN	44.3	39.1	16	66.3
Wimmera	Carpolac	CAN	45.6	38.9	10	66.6
	Hamilton	CAN	47.1	37.0	10	65.9
	Hamilton	CANG	48.3	37.7	11	66.0
	Lillimur	CAN	43.6	40.1	7	67.3
	Murtoa	CAN	45.6	38.3	9	66.4
	Naracoorte	CAN	45.6	39.7	7	66.6
	Natimuk	CAN	45.5	38.5	7	66.6
	Nhill	CAN	43.7	39.3	9	67.1
VIC weighted average			**45.8**	**39.0**	**10**	**66.0**
Vic minimum			**42.6**	**36.1**	**5**	**63.5**
Vic maximum			**50.2**	**41.3**	**16**	**67.3**

❶ % in whole seed @ 6% moisture.
❷ % in oil-free meal @ 10% moisture.
❸ µmoles/g in oil-free meal @ 10% moisture.
❹ kilograms/ hectolitre.

Table 6. Quality data – Western Australia.

Port zone	Grade	Oil % ❶	Protein % ❷	Glucosinolates µmoles/g ❸	Test weight kg/hL ❹
Albany	N/A	43.0	38.7	12	68.5
Esperance	N/A	43.8	40.1	12	68.0
Geraldton	N/A	44.8	40.3	11	67.4
Kwinana	N/A	44.3	39.2	12	67.6
WA weighted average		**43.9**	**39.4**	**12**	**67.9**
WA minimum		**43.0**	**38.7**	**11**	**67.4**
WA maximum		**44.8**	**40.3**	**12**	**68.5**

❶ % in whole seed @ 6% moisture.
❷ % in oil-free meal @ 10% moisture.
❸ µmoles/g in oil-free meal @ 10% moisture.
❹ kilograms/ hectolitre.

Fatty acid composition by state

Table 7. Fatty acid composition – New South Wales.

Region	Zone	Site	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	Poly[1]	Mono[2]	Sat[3]	IV[4]
Queensland	Goondiwindi	Goondiwindi (C)	0.06	3.8	0.3	<0.1	0.2	2.2	64.7	17.2	8.9	0.7	1.3	0.3	<0.1	0.2	0.1	26.0	66.6	7.4	109.9
Northern NSW	Dubbo North	Coonamble (C)	0.06	4.0	0.2	<0.1	0.2	2.3	65.1	17.5	8.2	0.6	1.1	0.3	<0.1	0.2	0.1	25.6	66.8	7.6	108.9
		Gilgandra (C)	0.06	4.1	0.3	<0.1	0.2	2.2	65.9	17.4	7.7	0.6	1.1	0.3	<0.1	0.1	0.1	25.0	67.6	7.4	108.0
	Dubbo West	Nevertire (C)	0.07	4.3	0.3	<0.1	0.1	2.0	63.3	19.5	8.2	0.5	1.1	0.2	<0.1	0.1	0.1	27.8	64.8	7.4	111.0
		Trangie (C)	0.07	4.3	0.3	<0.1	0.1	2.0	64.5	17.9	8.4	0.6	1.1	0.3	<0.1	0.2	0.1	26.4	66.1	7.5	109.8
	Moree North	Croppa Creek (C)	0.06	4.0	0.2	<0.1	0.2	2.3	65.1	17.6	8.1	0.7	1.2	0.3	<0.1	0.2	0.1	25.6	66.9	7.5	108.8
		Moree (C)	0.06	3.9	0.3	<0.1	0.2	2.2	65.0	17.2	8.7	0.6	1.2	0.3	<0.1	0.1	0.1	25.9	66.8	7.3	109.8
	Narrabri	Bellata (C)	0.07	4.2	0.3	<0.1	0.2	2.2	64.7	17.4	8.5	0.6	1.2	0.3	<0.1	0.2	0.1	25.9	66.5	7.6	109.3
		Boggabri (C)	0.07	3.9	0.3	<0.1	0.2	2.3	64.0	18.1	8.6	0.6	1.2	0.3	<0.1	0.2	0.1	26.7	65.8	7.5	110.3
		Gunnedah (C)	0.06	3.9	0.3	<0.1	0.2	2.3	65.0	17.6	8.2	0.7	1.2	0.3	<0.1	0.2	0.1	25.7	66.8	7.5	109.0
		Narrabri (C)	0.06	3.9	0.2	<0.1	0.2	2.4	65.2	17.6	8.0	0.6	1.2	0.3	<0.1	0.2	0.1	25.6	66.9	7.5	108.7
	Werris Creek	Premer (C)	0.06	4.1	0.3	<0.1	0.2	2.2	64.1	18.2	8.4	0.6	1.2	0.3	<0.1	0.2	0.1	26.6	65.8	7.6	109.9
		Spring Ridge (C)	0.06	3.8	0.2	<0.1	0.2	2.3	63.6	18.1	9.4	0.6	1.3	0.3	<0.1	0.1	0.1	27.5	65.3	7.2	111.9
		Werris Creek (C)	0.06	3.9	0.2	<0.1	0.2	2.3	65.1	17.3	8.3	0.6	1.2	0.3	<0.1	0.2	0.1	25.6	66.9	7.5	109.0
		Willow Tree (C)	0.06	3.9	0.2	<0.1	0.2	2.2	64.5	17.6	8.9	0.6	1.2	0.3	<0.1	0.1	0.1	26.5	66.2	7.3	110.5
Northern NSW [5] weighted average			**0.06**	**4.0**	**0.3**	**<0.1**	**0.2**	**2.2**	**65.0**	**17.6**	**8.3**	**0.6**	**1.2**	**0.3**	**<0.1**	**0.2**	**0.1**	**25.8**	**66.7**	**7.5**	**109.3**
Southern NSW	Boree Creek	Boree Creek (C)	0.07	4.3	0.3	<0.1	<0.1	1.8	60.9	19.8	10.7	0.5	1.1	0.2	<0.1	<0.1	0.1	30.5	62.4	7.1	115.7
		Henty West (C)	0.06	4.3	0.2	<0.1	0.1	1.9	60.9	19.5	10.7	0.6	1.2	0.3	<0.1	0.1	0.2	30.2	62.6	7.2	115.3
		Milbrulong (C)	0.06	4.2	0.2	<0.1	0.1	1.9	60.8	19.9	10.4	0.6	1.2	0.3	<0.1	0.1	0.1	30.3	62.5	7.2	115.2
		Rand (C)	0.06	4.1	0.2	<0.1	0.1	1.8	61.3	19.8	10.3	0.6	1.2	0.3	<0.1	0.1	0.1	30.1	62.9	7.0	115.1
	Cunnigar	Cootamundra (C)	0.06	4.1	0.2	<0.1	0.2	2.0	61.4	18.6	11.1	0.6	1.2	0.3	<0.1	0.1	0.1	29.6	63.2	7.2	115.2
		Cowra (C)	0.06	4.2	0.3	<0.1	0.1	1.8	63.9	18.3	9.0	0.6	1.1	0.3	<0.1	0.1	0.1	27.3	65.6	7.1	111.5
		Cunningar (C)	0.06	4.3	0.3	<0.1	0.2	1.7	63.3	19.2	8.7	0.5	1.1	0.3	<0.1	<0.1	0.1	28.0	64.9	7.1	111.8
		Greenethorpe (C)	0.06	4.4	0.3	<0.1	0.1	1.7	61.0	19.8	10.5	0.5	1.1	0.3	<0.1	0.1	0.1	30.4	62.6	7.0	115.5
		Maimuru (C)	0.06	4.3	0.2	<0.1	0.1	1.8	61.4	19.3	10.5	0.5	1.1	0.3	<0.1	0.1	0.1	29.8	63.1	7.1	115.0
	Griffith	Barellan (C)	0.06	4.2	0.3	<0.1	<0.1	1.8	62.6	19.0	9.8	0.5	1.1	0.2	<0.1	0.1	0.1	28.8	64.2	7.0	113.5
		Hillston (C)	0.07	4.1	0.3	<0.1	0.2	2.1	63.2	18.2	9.6	0.6	1.1	0.2	<0.1	0.1	0.1	27.7	65.0	7.3	112.1
		Merriwagga (C)	0.06	4.2	0.3	0.1	0.2	2.3	62.1	18.6	10.1	0.6	1.1	0.2	<0.1	0.1	0.1	28.7	63.8	7.5	113.4
		Tabbita (C)	0.06	4.2	0.3	0.1	0.1	2.1	64.4	17.2	9.4	0.5	1.1	0.2	<0.1	0.1	0.1	26.6	66.1	7.3	111.0
	Junee	Coleambally (C)	0.04	3.7	0.2	<0.1	<0.1	1.8	69.7	18.8	3.1	0.6	1.3	0.3	<0.1	0.1	0.1	21.9	71.4	6.7	101.8
		Coolamon(C)	0.06	4.2	0.3	0.1	0.1	1.9	62.1	18.5	10.5	0.6	1.2	0.3	<0.1	0.1	0.1	29.0	63.8	7.2	114.2
		Grong Grong (C)	0.06	4.2	0.3	0.1	0.1	1.9	61.7	19.0	10.4	0.5	1.1	0.2	<0.1	0.1	0.1	29.4	63.4	7.2	114.5
		Junee Sub (C)	0.05	4.2	0.2	<0.1	0.1	1.8	63.5	19.0	8.7	0.5	1.1	0.3	<0.1	<0.1	0.1	27.8	65.1	7.1	111.7
		Narrandera (C)	0.06	4.0	0.2	0.1	0.1	1.9	62.4	18.2	10.8	0.5	1.1	0.2	<0.1	<0.1	0.1	29.0	64.0	7.0	114.7
	Parkes	Caragabal (C)	0.05	4.0	0.2	0.1	0.2	2.2	63.3	17.8	9.8	0.6	1.2	0.3	<0.1	0.1	0.1	27.6	65.0	7.4	112.1
		Parkes Sub (C)	0.06	4.0	0.2	<0.1	0.1	2.0	63.2	17.9	10.2	0.6	1.2	0.3	<0.1	0.1	0.1	28.1	64.9	7.0	113.3
		Red Bend (C)	0.05	4.0	0.2	<0.1	<0.1	1.9	61.4	20.6	9.6	0.5	1.1	0.3	<0.1	<0.1	0.1	30.2	62.9	6.9	114.8
		Trundle (C)	0.06	4.2	0.2	0.1	<0.1	2.0	63.2	19.6	8.4	0.5	1.1	0.2	<0.1	0.1	<0.1	28.1	64.7	7.2	111.5
	Temora	Ardlethan (C)	0.06	4.2	0.2	0.1	0.1	1.9	62.1	18.8	10.3	0.5	1.1	0.3	<0.1	<0.1	0.1	29.1	63.7	7.2	114.1
		Bribbaree (C)	0.05	4.2	0.2	<0.1	0.1	1.9	60.5	19.7	11.0	0.6	1.2	0.3	<0.1	<0.1	0.1	30.7	62.2	7.1	116.1
		Milvale (C)	0.05	4.2	0.2	0.1	0.1	1.7	62.2	19.5	9.7	0.5	1.2	0.3	<0.1	<0.1	0.1	29.3	63.8	6.9	114.0
		Quandialla (C)	0.05	4.2	0.2	0.1	<0.1	1.8	60.7	20.3	10.4	0.5	1.2	0.3	<0.1	0.1	0.1	30.7	62.3	7.0	115.7
		Temora Sub (C)	0.06	4.1	0.2	0.1	0.1	1.7	63.0	18.2	10.3	0.5	1.2	0.3	<0.1	<0.1	0.1	28.5	64.6	6.9	113.8
	Wyalong	Calleen (C)	0.06	4.3	0.2	0.1	0.1	2.0	62.9	18.8	9.3	0.6	1.1	0.2	<0.1	0.1	0.1	28.1	64.5	7.4	112.3
		Condobolin (C)	0.06	4.1	0.2	0.1	<0.1	1.8	64.0	18.9	8.6	0.5	1.1	0.2	<0.1	<0.1	<0.1	27.6	65.5	6.9	111.6
		Wyalong (C)	0.06	4.2	0.2	0.1	<0.1	1.9	65.1	16.5	9.8	0.5	1.1	0.2	<0.1	0.1	<0.1	26.3	66.6	7.1	111.3
Southern NSW weighted average			**0.06**	**4.2**	**0.2**	**0.1**	**0.1**	**1.9**	**62.2**	**19.1**	**10.0**	**0.5**	**1.1**	**0.3**	**<0.1**	**0.1**	**0.1**	**29.0**	**63.9**	**7.1**	**113.8**
NSW [5] weighted average			**0.06**	**4.1**	**0.2**	**0.1**	**0.1**	**1.9**	**62.7**	**18.8**	**9.7**	**0.6**	**1.1**	**0.3**	**<0.1**	**0.1**	**0.1**	**28.5**	**64.3**	**7.2**	**113.0**
NSW [5] minimum			**0.04**	**3.7**	**0.2**	**<0.1**	**<0.1**	**1.7**	**60.5**	**16.5**	**3.1**	**0.5**	**1.1**	**0.2**	**<0.1**	**<0.1**	**<0.1**	**21.9**	**62.2**	**6.7**	**101.8**
NSW [5] maximum			**0.07**	**4.4**	**0.3**	**0.1**	**0.2**	**2.4**	**69.7**	**20.6**	**11.1**	**0.7**	**1.3**	**0.3**	**<0.1**	**0.2**	**0.2**	**30.7**	**71.4**	**7.6**	**116.1**

[1] Poly – sum of polyunsaturated fatty acids (18:2 and 18:3).
[2] Mono – sum of monounsaturated fatty acids (16:1, 17:1, 18:1, 20:1, 22:1 and 24:1).
[3] Sat – sum of saturated fatty acids (14:0, 16:0, 17:0, 18:0, 20:0, 22:0 and 24:0).
[4] IV – iodine value calculated from fatty acid composition.
[5] Includes data from two sites in southern Queensland

Table 8. Fatty acid composition – South Australia.

Zone	Site	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	Poly❶	Mono❷	Sat❸	IV❹
Adelaide	Port Adelaide (C)	0.05	4.2	0.2	0.1	0.2	2.0	62.5	18.1	10.4	0.6	1.2	0.3	<0.1	<0.1	<0.1	28.5	64.2	7.3	113.5
	Port Adelaide (GM)	0.07	4.7	0.3	0.1	<0.1	2.1	60.1	20.8	9.7	0.5	1.1	0.2	<0.1	0.1	0.1	30.5	61.6	7.9	114.2
Central	Ardrossan (GM)	0.06	4.6	0.3	0.1	0.1	2.0	61.0	19.5	10.5	0.5	1.0	0.2	<0.1	<0.1	<0.1	30.0	62.5	7.5	114.8
	Bowmans (C)	0.05	4.3	0.2	0.1	0.1	2.0	62.4	18.5	9.9	0.6	1.2	0.3	<0.1	0.1	<0.1	28.4	64.1	7.5	113.0
	Gladstone (C)	0.06	4.4	0.2	0.1	0.1	1.9	60.8	19.9	10.2	0.6	1.2	0.3	<0.1	0.1	0.1	30.1	62.5	7.4	114.6
	Owen (GM)	0.07	4.6	0.3	0.1	0.1	2.1	62.0	18.8	9.7	0.6	1.1	0.3	<0.1	0.1	0.1	28.5	63.7	7.8	112.6
	Port Giles (C)	0.06	4.2	0.2	0.1	0.2	2.0	61.6	18.8	10.6	0.6	1.2	0.3	<0.1	0.1	0.1	29.3	63.4	7.3	114.4
	Port Pirie (GM)	0.07	4.6	0.3	0.1	<0.1	2.1	60.9	19.8	10.1	0.5	1.0	0.2	<0.1	0.1	0.1	29.9	62.4	7.7	114.2
	Roseworthy (C)	0.06	4.3	0.2	0.1	0.1	2.0	62.3	18.4	10.2	0.6	1.2	0.3	<0.1	0.1	0.1	28.6	64.0	7.4	113.3
	Roseworthy (GM)	0.07	4.6	0.3	0.1	<0.1	2.0	61.2	19.9	9.8	0.5	1.0	0.2	<0.1	0.1	0.1	29.7	62.7	7.6	113.8
Eastern	Bordertown (GM)	0.07	4.7	0.3	0.1	<0.1	2.0	59.5	21.2	10.2	0.5	1.0	0.2	<0.1	<0.1	0.1	31.4	61.0	7.6	115.7
	Coonalpyn (GM)	0.07	4.6	0.3	0.1	0.1	2.0	60.9	19.5	10.4	0.5	1.1	0.2	<0.1	0.1	0.1	29.9	62.5	7.6	114.6
	Dooen (C)	0.06	4.3	0.3	0.1	0.2	2.0	61.6	18.7	10.8	0.5	1.2	0.2	<0.1	<0.1	0.1	29.5	63.3	7.2	114.8
	Frances (C)	0.05	4.0	0.3	0.1	0.2	2.0	62.7	17.5	11.0	0.5	1.2	0.2	<0.1	<0.1	0.1	28.5	64.5	7.0	114.4
	Keith (C)	0.06	4.5	0.3	0.1	0.2	2.0	60.7	19.0	10.8	0.6	1.2	0.3	<0.1	0.1	0.1	29.8	62.6	7.6	114.8
	Tailem Bend (C)	0.06	4.4	0.3	0.1	0.1	1.9	61.4	18.9	10.6	0.5	1.2	0.3	<0.1	0.1	0.1	29.5	63.2	7.3	114.5
	Wolseley (C)	0.06	4.3	0.3	0.1	0.2	2.0	61.7	18.2	11.0	0.5	1.3	0.3	<0.1	0.1	0.1	29.2	63.5	7.3	114.6
Western	Arno Bay (C)	0.06	4.5	0.3	0.1	0.1	1.8	61.2	19.9	10.0	0.5	1.2	0.3	<0.1	0.1	0.1	29.9	62.8	7.3	114.4
	Cummins (C)	0.06	4.4	0.3	0.1	0.1	1.9	62.3	18.6	10.0	0.5	1.2	0.3	<0.1	0.1	0.1	28.6	64.0	7.4	113.3
	Cummins (GM)	0.06	4.6	0.3	0.1	<0.1	2.0	61.2	20.2	9.5	0.5	1.1	0.2	<0.1	<0.1	0.1	29.7	62.8	7.5	113.7
	Edillilie (GM)	0.06	4.6	0.3	0.1	<0.1	1.9	61.0	20.1	9.9	0.5	1.0	0.2	<0.1	0.1	<0.1	30.0	62.5	7.5	114.2
	Kimba (C)	0.07	4.5	0.3	0.1	0.1	1.9	61.0	20.5	9.4	0.5	1.2	0.3	<0.1	0.1	0.1	29.9	62.6	7.5	113.7
	Port Lincoln (C)	0.05	4.3	0.2	0.1	0.1	1.9	62.7	18.2	10.1	0.5	1.2	0.3	<0.1	0.1	<0.1	28.3	64.4	7.3	113.1
	Port Neill (C)	0.06	4.3	0.2	0.1	0.1	1.9	61.9	19.0	10.2	0.5	1.2	0.3	<0.1	<0.1	<0.1	29.2	63.5	7.3	114.1
	Rudall (GM)	0.06	4.5	0.3	0.1	<0.1	2.0	61.9	20.0	9.1	0.5	1.1	0.3	<0.1	<0.1	<0.1	29.1	63.4	7.5	112.9
	Tumby Bay (GM)	0.07	4.7	0.3	0.1	<0.1	2.0	60.8	19.7	10.6	0.5	1.0	0.2	<0.1	<0.1	<0.1	30.2	62.2	7.6	115.1
SA weighted average		**0.06**	**4.4**	**0.3**	**0.1**	**0.1**	**2.0**	**61.6**	**19.1**	**10.2**	**0.5**	**1.2**	**0.3**	**<0.1**	**0.1**	**0.1**	**29.3**	**63.3**	**7.4**	**114.0**
SA minimum		**0.05**	**4.0**	**0.2**	**0.1**	**<0.1**	**1.8**	**59.5**	**17.5**	**9.1**	**0.5**	**1.0**	**0.2**	**<0.1**	**<0.1**	**<0.1**	**28.3**	**61.0**	**7.0**	**112.6**
SA maximum		**0.07**	**4.7**	**0.3**	**0.1**	**0.2**	**2.1**	**62.7**	**21.2**	**11.0**	**0.6**	**1.3**	**0.3**	**<0.1**	**0.1**	**0.1**	**31.4**	**64.5**	**7.9**	**115.7**

❶ Poly – sum of polyunsaturated fatty acids (18:2 and 18:3).
❷ Mono – sum of monounsaturated fatty acids (16:1, 17:1, 18:1, 20:1, 22:1 and 24:1).
❸ Sat – sum of saturated fatty acids (14:0, 16:0, 17:0, 18:0, 20:0, 22:0 and 24:0).
❹ IV – iodine value calculated from fatty acid composition.

Table 9. Fatty acid composition – Victoria.

Zone	Site	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	Poly❶	Mono❷	Sat❸	IV❹
Port Zone	Geelong (C)	0.05	4.2	0.2	0.1	0.1	1.9	61.0	19.0	11.3	0.5	1.2	0.3	<0.1	<0.1	0.1	30.3	62.6	7.1	116.2
Central Victoria	Berrybank (C)	0.05	4.1	0.2	0.1	0.1	1.8	60.4	19.3	11.7	0.5	1.2	0.2	<0.1	<0.1	0.1	31.0	62.1	6.9	117.3
	Berrybank (GM)	0.05	4.2	0.3	0.1	<0.1	2.0	60.8	20.0	10.8	0.5	0.9	0.2	<0.1	<0.1	<0.1	30.7	62.2	7.1	116.0
	Dunolly (C)	0.05	4.1	0.2	<0.1	<0.1	1.9	61.5	19.1	10.7	0.5	1.2	0.3	<0.1	<0.1	<0.1	29.8	63.1	7.1	115.1
	Elmore (C)	0.05	4.0	0.2	0.1	<0.1	1.8	62.9	18.0	10.9	0.5	1.1	0.2	<0.1	<0.1	<0.1	28.8	64.4	6.8	114.7
	Mitiamo (C)	0.06	4.2	0.2	0.1	<0.1	1.6	61.1	19.9	10.8	0.5	1.1	0.2	<0.1	<0.1	<0.1	30.6	62.7	6.7	116.3
	Murchison East (C)	0.05	4.1	0.2	<0.1	<0.1	1.8	61.7	18.7	11.1	0.5	1.2	0.2	<0.1	<01	<0.1	29.8	63.3	6.9	115.8
	Tandarra (C)	0.06	4.1	0.2	<0.1	<0.1	1.8	61.2	19.7	10.7	0.5	1.1	0.2	<0.1	<0.1	<0.1	30.4	62.8	6.8	116.0
	Westmere (C)	0.05	4.1	0.2	<0.1	0.1	1.9	61.4	18.8	11.2	0.2	1.1	0.2	<0.1	<0.1	<0.1	30.1	62.9	7.0	116.0
	Westmere (GM)	0.05	4.3	0.2	0.1	<0.1	2.1	61.1	19.9	10.4	0.5	0.9	0.2	<0.1	<0.1	<0.1	30.3	62.5	7.2	115.3
	Willaura	0.05	4.2	0.2	0.1	0.1	2.0	61.7	18.8	10.7	0.5	1.1	0.3	<0.1	<0.1	<0.1	29.5	63.3	7.2	114.9
North East	Barnes Crossing (C)	0.06	4.2	0.2	0.1	<0.1	1.6	60.4	19.9	11.6	0.4	1.1	0.2	<0.1	<0.1	<0.1	31.4	61.9	6.7	117.6
	Deniliquin (C)	0.05	4.2	0.2	<0.1	<0.1	1.8	61.6	19.2	10.9	0.5	1.1	0.2	<0.1	<0.1	<0.1	30.0	63.1	6.9	115.7
	Dookie (C)	0.05	4.1	0.2	<0.1	0.1	1.8	61.3	19.1	11.3	0.5	1.2	0.3	<0.1	<0.1	<0.1	30.4	62.8	6.8	116.4
	Numurkah (C)	0.05	4.1	0.2	0.1	<0.1	1.6	61.3	19.4	11.3	0.5	1.1	0.2	<0.1	<0.1	<0.1	30.7	62.7	6.6	117.0
	Numurkah (GM)	0.05	4.2	0.2	0.1	<0.1	2.1	61.3	19.6	10.8	0.4	0.9	0.2	<0.1	<0.1	<0.1	30.4	62.5	7.1	115.9
	Oaklands (C)	0.05	4.1	0.2	0.1	<0.1	1.8	61.6	19.3	10.9	0.5	1.1	0.2	<0.1	<0.1	<0.1	30.2	63.0	6.8	116.0
	Oaklands (GM)	0.05	4.1	0.2	<0.1	<0.1	2.1	61.6	19.5	10.6	0.5	0.9	0.2	<0.1	<0.1	<0.1	30.1	62.8	7.1	115.4
	Tocumwal (C)	0.06	4.2	0.3	0.1	<0.1	1.8	61.6	18.8	10.9	0.5	1.2	0.3	<0.1	<0.1	0.1.	29.7	63.3	7.0	115.3
	Yarrawonga (C)	0.06	4.1	0.2	0.2	0.1	1.9	60.6	19.5	11.1	0.5	1.2	0.3	<0.1	<0.1	0.1	30.6	62.3	7.1	116.3
Southern Mallee	Beulah (C)	0.07	4.3	0.3	0.1	0.2	2.0	61.4	18.8	10.8	0.5	1.1	0.3	<0.1	0.1	<0.1	29.6	63.0	7.4	114.8
	Charlton (C)	0.06	4.2	0.3	0.2	0.1	1.9	62.0	18.5	10.6	0.5	1.2	0.3	<0.1	0.1	0.1	29.1	63.7	7.2	114.3
	Donald (C)	0.06	4.1	0.3	0.2	0.1	2.0	62.5	18.0	10.4	0.6	1.3	0.3	<0.1	0.1	0.1	28.4	64.3	7.3	113.5
	Hopetoun (C)	0.07	4.4	0.3	0.1	0.2	2.0	61.6	18.7	10.9	0.5	1.0	0.2	<0.1	<0.1	<0.1	29.5	63.2	7.3	114.9
	Rainbow (C)	0.07	4.3	0.3	0.1	0.2	2.0	61.7	18.5	10.7	0.5	1.1	0.3	<0.1	0.1	0.1	29.2	63.4	7.4	114.4
	Warracknabeal (C)	0.06	4.1	0.3	0.1	0.2	2.1	62.5	18.0	10.4	0.6	1.3	0.3	<0.1	0.1	0.1	28.4	64.3	7.3	113.4
	Wycheproof (C)	0.06	4.2	0.3	0.2	0.1	1.9	62.7	17.6	10.8	0.5	1.2	0.3	<0.1	0.1	0.1	28.5	64.4	7.1	114.1
Swan Hill	Boort (C)	0.06	4.2	0.3	0.2	0.1	1.9	60.9	19.1	11.1	0.5	1.2	0.3	<0.1	0.1	0.1	30.2	62.6	7.2	115.7
	Piangil (C)	0.07	4.3	0.3	0.1	0.2	2.1	61.9	18.4	10.7	0.5	1.1	0.2	<0.1	0.1	<0.1	29.1	63.5	7.4	114.3
	Quambatook (C)	0.07	4.2	0.3	0.2	0.1	1.9	61.1	19.2	10.8	0.5	1.1	0.3	<0.1	0.1	0.1	30.0	62.8	7.2	115.3
Wimmera	Carpolac (C)	0.06	4.1	0.3	0.1	0.2	2.0	62.0	17.8	11.1	0.6	1.2	0.3	<0.1	0.1	0.1	28.9	63.8	7.3	114.5
	Hamilton (C)	0.06	4.1	0.3	0.1	0.2	2.0	61.6	18.3	11.1	0.5	1.1	0.3	<0.1	<0.1	0.1	29.4	63.3	7.3	115.0
	Hamilton (GM)	0.06	4.4	0.3	0.1	<0.1	2.0	60.6	20.6	9.9	0.5	1.0	0.3	<0.1	<0.1	0.1	30.5	62.1	7.4	114.8
	Lillimur (C)	0.06	4.2	0.3	0.1	0.2	2.0	61.7	18.2	11.0	0.6	1.3	0.3	<0.1	0.1	0.1	29.1	63.6	7.3	114.6
	Murtoa (C)	0.06	4.1	0.3	0.1	0.2	2.1	63.0	17.6	10.3	0.6	1.2	0.3	<0.1	0.1	0.1	27.9	64.8	7.3	113.0
	Naracoorte (C)	0.06	4.2	0.3	0.1	0.2	2.0	60.5	19.3	11.1	0.5	1.2	0.3	<0.1	0.1	0.1	30.4	62.3	7.3	115.9
	Natimuk (C)	0.06	4.1	0.3	0.2	0.2	2.0	61.9	18.2	10.7	0.6	1.2	0.3	<0.1	0.1	0.1	28.9	63.7	7.4	114.1
	Nhill (C)	0.06	4.3	0.3	0.2	0.2	2.0	61.5	18.4	10.8	0.6	1.3	0.3	<0.1	0.1	0.1	29.1	63.4	7.5	114.3
Vic weighted average		**0.06**	**4.2**	**0.2**	**0.1**	**0.1**	**1.9**	**61.7**	**18.7**	**10.8**	**0.5**	**1.2**	**0.3**	**<0.1**	**<0.1**	**<0.1.**	**29.6**	**63.3**	**7.1**	**115.1**
Vic minimum		**0.05**	**4.0**	**0.2**	**<0.1**	**<0.1**	**1.6**	**60.4**	**17.6**	**9.9**	**0.4**	**0.9**	**0.2**	**<0.1**	**<0.1**	**<0.1**	**27.9**	**61.9**	**6.6**	**113.0**
Vic maximum		**0.07**	**4.4**	**0.3**	**0.2**	**0.2**	**2.1**	**63.0**	**20.6**	**11.7**	**0.6**	**1.3**	**0.3**	**<0.1**	**0.1**	**0.1**	**31.4**	**64.8**	**7.5**	**117.6**

❶ Poly – sum of polyunsaturated fatty acids (18:2 and 18:3).
❷ Mono – sum of monounsaturated fatty acids (16:1, 17:1, 18:1, 20:1, 22:1 and 24:1).
❸ Sat – sum of saturated fatty acids (14:0, 16:0, 17:0, 18:0, 20:0, 22:0 and 24:0).
❹ IV – iodine value calculated from fatty acid composition.

Table 10. Fatty acid composition – Western Australia.

Region/Zone/Site	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	Poly❶	Mono❷	Sat❸	IV ❹
Albany	0.07	4.7	0.3	0.1	<0.1	2.0	61.7	19.7	9.1	0.5	1.1	0.3	<0.1	0.1	0.1	28.9	63.3	7.8	112.3
Esperance	0.07	4.6	0.3	0.1	<0.1	2.0	61.1	19.8	9.9	0.5	1.1	0.3	<0.1	0.1	0.1	29.7	62.6	7.7	113.9
Geraldton	0.07	4.3	0.3	0.2	<0.1	1.9	61.2	20.6	9.3	0.5	1.1	0.3	<0.1	0.1	<0.1	29.9	62.8	7.3	113.9
Kwinana	0.07	4.4	0.3	0.1	<0.1	2.1	62.5	19.4	9.0	0.5	1.1	0.3	<0.1	0.1	0.1	28.4	64.0	7.6	111.9
WA weighted average	**0.07**	**4.5**	**0.3**	**0.1**	**<0.1**	**2.0**	**61.8**	**19.7**	**9.3**	**0.5**	**1.1**	**0.3**	**<0.1**	**0.1**	**0.1**	**29.0**	**63.4**	**7.6**	**112.7**
WA Minimum	**0.07**	**4.3**	**0.3**	**0.1**	**<0.1**	**1.9**	**61.1**	**19.4**	**9.0**	**0.5**	**1.1**	**0.3**	**<0.1**	**0.1**	**<0.1**	**28.4**	**62.6**	**7.3**	**111.9**
WA Maximum	**0.07**	**4.7**	**0.3**	**0.2**	**<0.1**	**2.1**	**62.5**	**20.6**	**9.9**	**0.5**	**1.1**	**0.3**	**<0.1**	**0.1**	**0.1**	**29.9**	**64.0**	**7.8**	**113.9**

❶ Poly – sum of polyunsaturated fatty acids (18:2 and 18:3).
❷ Mono – sum of monounsaturated fatty acids (16:1, 17:1, 18:1, 20:1, 22:1 and 24:1).
❸ Sat – sum of saturated fatty acids (14:0, 16:0, 17:0, 18:0, 20:0, 22:0 and 24:0).
❹ IV – iodine value calculated from fatty acid composition.

Chlorophyll

The average chlorophyll content for the Australian harvest in 2023 was 2 mg/kg (2 ppm) in whole seed as received, a decrease of 3 mg/kg (3 ppm) from the 2022 harvest of 5 mg/kg (5 ppm).

Table 11. Chlorophyll by region/ port zone.

State	Region/port zone	Chlorophyll (mg/kg) [1]
NSW	Northern	3
NSW	Southern	3
SA	Adelaide	3
SA	Central	2
SA	Eastern	3
SA	Western	3
Vic	Victoria	3
WA	Albany	2
WA	Esperance	2
WA	Geraldton	1
WA	Kwinana	2
Australian weighted average		**2**

[1] mg/kg in whole seed as received.
Red line indicates the AOF limit of 12 mg/kg in whole seed.

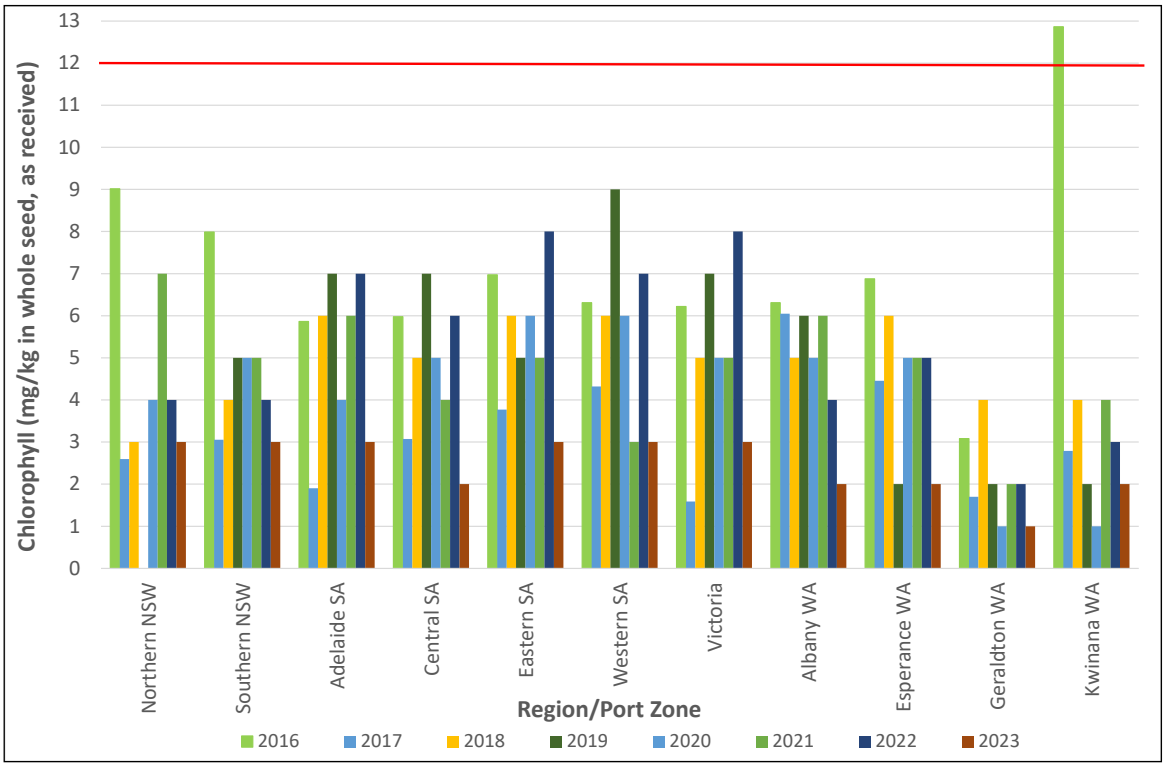


Figure 31. Average chlorophyll content by region/ port zone 2016–2023.

Definitions, methods and references

Definitions

Canola (CAN/CANO or C)

Canola is defined as seed of the species *Brassica napus* or *Brassica rapa* but containing less than 30 micromoles of specified glucosinolates per gram of oil-free, air-dry solids and not more than 2% erucic acid of total fatty acids in the oil component. The specified glucosinolates are any one or a mixture of 3-butenyl, 4-pentenyl, 2-hydroxy-3-butenyl and 2-hydroxy-4-pentenyl glucosinolates (Australian Oilseeds Federation (AOF) Issue 22, Version 2, 1 August 2023, page 31).

Canola is traded under the grade 'CAN' by GrainCorp Operations Limited and 'CANO' by Viterra Pty Ltd.

The AOF *Quality standards, technical information and typical analysis (2023)* Standard Reference for canola is CSO 1, Standard Reference for non-GM canola is CSO 1-a.

GM canola (CAGM/CANG or GM)

Genetically modified (GM) canola are lines approved for commercial release in Australia by the Office of the Gene Technology Regulator (OGTR).

Methods

Moisture content

Moisture is determined on whole seed using a Bruker MPA II spectrometer (NIRs) calibrated from results obtained using the International Standards Organisation (ISO) 665 – 'Oilseeds – determination of moisture and volatile matter content' 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 Bruker MPA II NIRs, calibrated from results obtained using ISO 659 'Oilseeds – determination of oil content (reference method)'. Oil is extracted from ground seed on either a Foss Soxtec™ 2050 or 8000 extraction system using hexane for 4 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 whole seed at 6% moisture.

Protein content

Protein content is determined on whole seed by Bruker MPA II NIRs, calibrated from samples analysed by the LECO elemental analyser using AOF 4-3.3 'Protein, crude, of meals (combustion)' method. Results are reported as percent protein (nitrogen × 6.25) in oil-free meal at 10% moisture.

Glucosinolate content

Total glucosinolate content is determined by Bruker MPA II NIRs, calibrated by obtaining results using 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 high-performance liquid chromatography methodology of the American Oil Chemists' Society (AOCS) with the added advantage of speed and economy. Results are reported as µmoles glucosinolates/gram in oil-free meal at 10% moisture.

Test weight

Test weight is a measure of the bulk density or volume of the oilseeds based on the entire sample as received. Measured in kilogram per hectolitre (kg/hL). The seed is measured using a Franklin chrondrometer.

Note: For this publication the test weight is analysed on a clean seed basis.

Fatty acid composition

Fatty acid composition involves methylation of fatty acids with a methanolic solution of potassium hydroxide. The method is based on International Olive Council, COI/T.20/ Doc. No. 33 'Determination of fatty acid methyl esters by gas chromatography'. 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 in the oil portion of the seed.

Iodine values

Iodine values are calculated from the fatty acid profile using AOCS Cd 1c-85 'Calculated iodine value'.

Chlorophyll content

Chlorophyll content was determined using AOCS method Ak 2-92 'Determination of chlorophyll content in rapeseed/canola'. Ground canola seed is placed in a mechanical microgrinder with solvent for one hour. The sample is then filtered, and the solution's absorbance is determined on a UV-Vis spectrophotometer at 625 nm, 665 nm and 705 nm. Results are reported as mg/kg in whole seed as received.

References

Australian Oilseeds Federation Section 1: *Quality standards, technical information and typical analysis 2023/24* Issue 22, 1 August 2023.