NSW GOVERNMENT
Department of Primary Industries

Quality of Australian canola

2017–18

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AOF Australian Oilseeds Federation

NSW GOVERNMENT Department of Primary Industries

Quality of Australian canola 2017–2018

D.E. Seberry
NSW Department of Primary Industries
Wagga Wagga

D.W. McCaffery
NSW Department of Primary Industries
Orange

T.M. Kingham
NSW Department of Primary Industries
Wagga Wagga

AOF
Australian Oilseeds Federation

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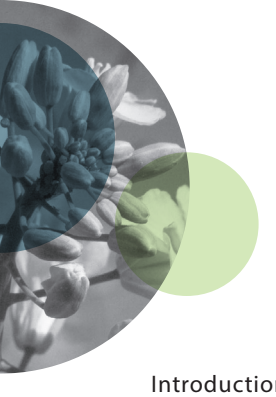

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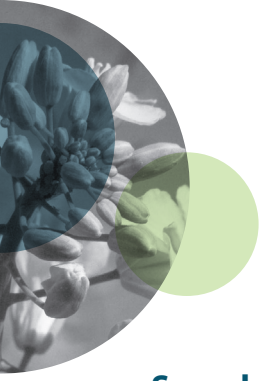


Introduction

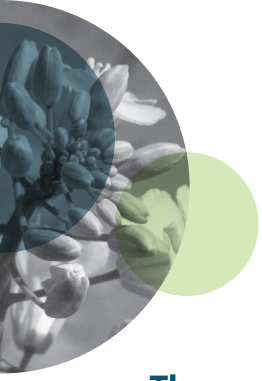
Sample analysis

Canola samples representing the 2017 harvest were received from GrainCorp Operations Limited (New South Wales and Victoria), Viterra Pty Ltd (South Australia) and CBH Group (Western Australia). These samples are representative of the seed collected at each of the receival points and have been taken to cumulatively represent the Australian harvest. Samples were received per site from New South Wales, South Australia and Victoria. Samples representing each of the four port zones were received from Western Australia. The NSW Department of Primary Industries (DPI) Oil Testing Service (OTS) has no control over sample collection and all data reported derives from analysing the provided samples.

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

Each sample was analysed for oil, protein and glucosinolate content; fatty acid profiles and volumetric grain weights according to the standard Australian Oilseeds Federation (AOF) methods outlined in the methods section at the back of this book. The 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 and at 6% moisture in whole seed. This is the second year for reporting glucosinolate content in oil-free meal at 10% moisture.

The 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 four port zone samples were analysed as received from CBH. Composite samples were created on a per weight basis to proportionally represent each site.



Weather and production review

The season

The 2017 growing season was a stark contrast to the generally average to well above average rainfall in the 2016 growing season. Below average to well below average rainfall was recorded for the crop sowing and establishment period of April to June (Figure 1), followed by average to above average rainfall across most of the cropping zones of Western Australia, South Australia and Victoria from July through September (Figure 2). The exception was New South Wales where rainfall was below to well below average from July to the end of September (Figure 2), and in combination with severe frosts in August and September, reduced crop yield potential in that state.

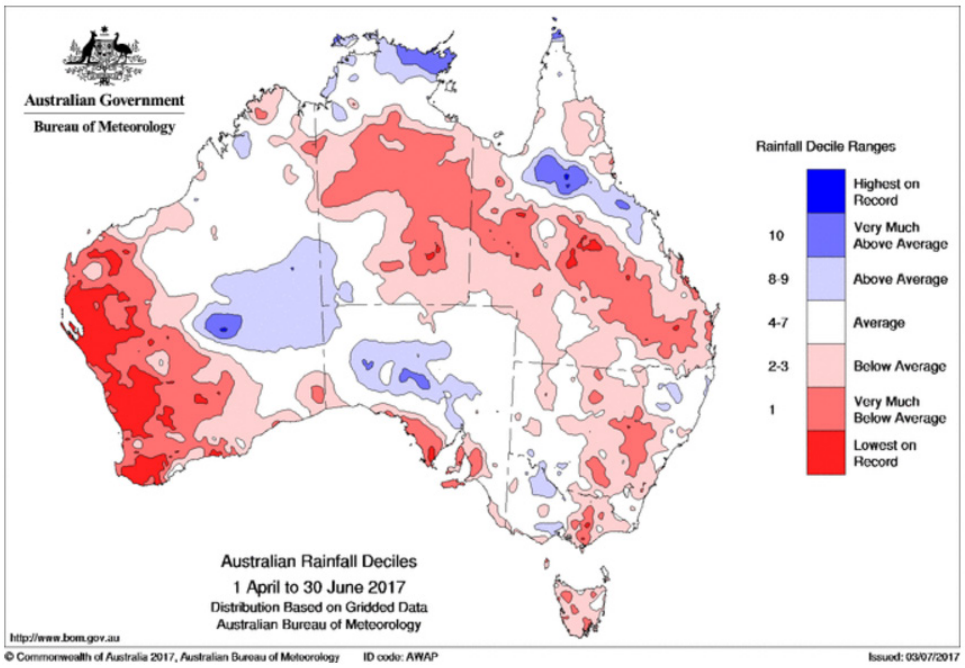


Figure 1. Australian rainfall deciles 1 April to 30 June 2017 (Source: Bureau of Meteorology)

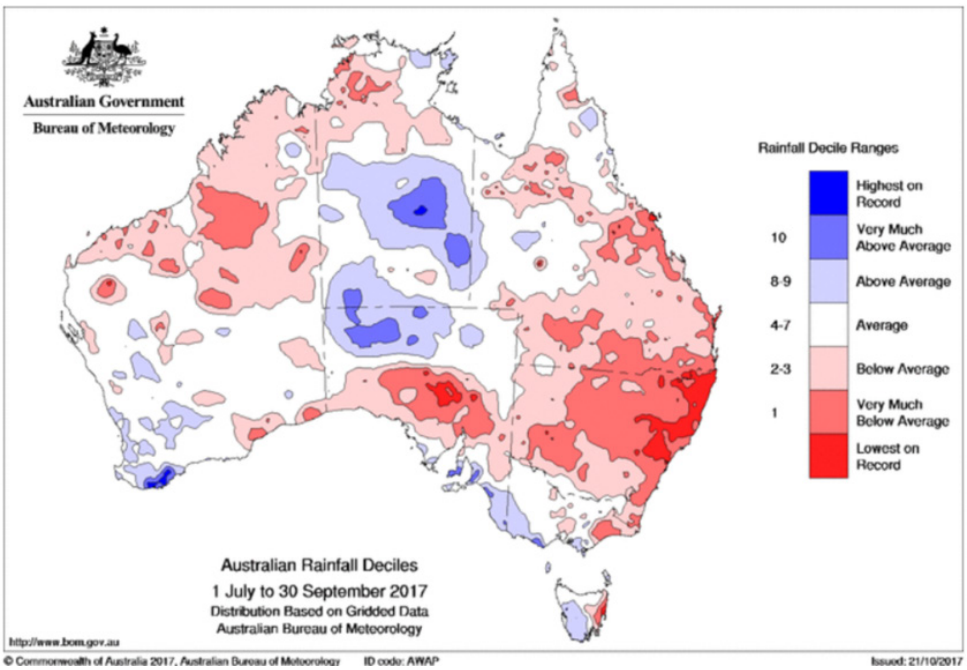


Figure 2. Australian rainfall deciles 1 July to 30 September 2017 (Source: Bureau of Meteorology)

New South Wales

The area sown to canola increased by 19% over the 2016 crop. There was some deep residual subsoil moisture left over from the very wet 2016, but the soil profiles were only 30–50% full in many areas. The season started promisingly, with rainfall of 150–190 mm around mid March in the centre and north of the state, which boosted moisture profiles in those areas, but the south only recorded average rainfall, and lighter in the west. The main sowing month of April, however, was mostly dry, resulting in patchy crop establishment along and west of the Newell highway. About 8% of the NSW crop was sown to dual-purpose winter type canola.Most of the crop was sown by mid May, but the later sown crops were sown dry and subsequently germinated on a single rainfall in mid May. Parts of the centre of the state missed this rain and crops failed to establish.

Rainfall was well below average for the bulk of winter (June–August), with parts of the state recording their driest winter for at least 20 years; some areas had their driest winter on record. By mid July failing crops of wheat and canola were being grazed off in western areas.

Seasonal conditions in August were noted for a general lack of rainfall and a number of severe frosts. Rainfall in the eastern Riverina and in the South West Slopes in early August maintained yield potential in those areas, but areas further north and west remained dry. The most severe frosts occurred on 20 August (–2 to –5 °C), 28–30 August (–3 to –6 °C) and again on 17–18 September (–2 to –6 °C), causing flower, pod and seed abortion and lowering yield potential. Many growers made the decision in late September to cut badly frosted crops for hay.

Dry and frosty conditions in August and September were followed by season-saving rainfall in mid and late October. This rain helped frosted crops that were still accessing some soil moisture recover, increased seed size and improved oil content for later-maturing crops in the South West Slopes and eastern Riverina. Oil contents ranged from 35–40% in the north and west, but were better than expected in the south-east, at 40–48%.

Crop disease was generally low due to the dry winter, while the main pest in 2017 was the cabbage aphid.

Final estimated production for NSW was 618,000 t from an estimated 600,000 ha for an average yield of 1.03 t/ha.

Victoria

The canola area was up 27% in 2017 compared with 2016. Victoria had the best seasonal conditions of all the canola-producing states.Rainfall for the three months leading into sowing was above average and some soil profiles were close to full at sowing, especially in the southern Mallee, the rest being at least 50% full. Most of crop sowing started in late April and was completed by mid May, but the south-west was almost too wet following well above average rainfall in April. Rainfall in May was average, followed by a very dry June. The dry June did not affect the crop as a nearly full moisture profile was available.

Rainfall was average for July, slightly above average for August and average to below average, especially in the north-east and the northern Mallee during September. A late frost on 26 September affected crops in the central-eastern Mallee, especially in low lying areas. Rainfall was average to slightly below average in October and, although temperatures were above average, there were no heat stress periods and yields were above average; oil contents were also above average.

The final estimated production for Victoria was 750,000 t from an estimated 450,000 ha for an average yield of 1.67 t/ha.

South Australia

The area sown to canola was 18% higher than in 2016. Subsoil moisture was generally good leading into April, with many soils at 80% water holding capacity due to well above average rainfall in January. The area of canola sown dry continued to increase in SA and, like other states, growers are aiming for early canola establishment and more timely winter cereal sowing. The 2017 seasonal break was sporadic with many parts of the state receiving just enough rainfall to germinate canola in late April. Large areas of Eyre and the Yorke Peninsula did not receive sufficient germinating rains until well into June, and even July in some areas. All cropping areas of South Australia had very much below average rainfall during June. However, above average rainfall was received in July and August, with rainfall then reverting to close to average for September and October.

Heat stress events during spring were lower than normal and not expected to have affected grain yield. There were several slight frosts in South Australia during the flowering/ pod filling stages, their impact being much lower than in NSW.

Levels of blackleg (both internal infection and upper canopy infection) and Sclerotinia were lower than in previous years.

The final estimated production for South Australia was 375,000 t from an estimated 250,000 ha for an average yield of 1.50 t/ha.

Western Australia

Area sown to canola increased by 11.5% to 1.35 million hectares in 2017. For the first time in Western Australia, this area was similar to barley.

Many grain growing regions of Western Australia received good falls of rain in the summer during January–February and in early March. Most regions, except the northern areas of the Geraldton port zone and the west Albany port zone, had plant-available moisture of 100 mm or more. Some estimates of intended sowings were more than 20% from 2016, although the lack of follow up rain at sowing and to a lesser extent limited seed availability pulled this area back.

Most growers sowing canola crops early in the season at the end of March and during April chased moisture down, resulting in variable emergence across paddocks, particularly as soil types changed within paddocks. The remainder of the crop was sown dry and most did not emerge until July when it started to rain. The April, May and June period was the driest on record for many areas of the grain belt in Western Australia.

The early-sown canola crops posed problems for crop protection and fertiliser decisions as many paddocks had plants at a wide range of growth stages. The later-emerging crops were not expected to yield well and growers reduced inputs.

Once the rain started in July it continued well into September and conditions were very mild with little heat stress during flowering or grain fill. The finish to the season was exceptional and resulted in canola crops yielding better than expected. The lack of fertiliser resulted in most crops being limited more by nutrition than moisture. Many crops suffered more insect damage than would normally be the case as growers took a minimal control approach to the season.

Grain yields were variable within farms and within regions due to the erratic season. Many crops suffered significant blackleg leaf infection, which affected the final yields where fungicides were not used.

Canola oil content was very high with most harvested grain at 45–50%. The cool, mild conditions during grain fill contributed to the high oil percentages and resulted in growers getting better returns than expected from the lower yields.

The final estimated production for Western Australia was 1.90 million tonnes from an estimated 1.35 million hectares for an average yield of 1.41 t/ha.

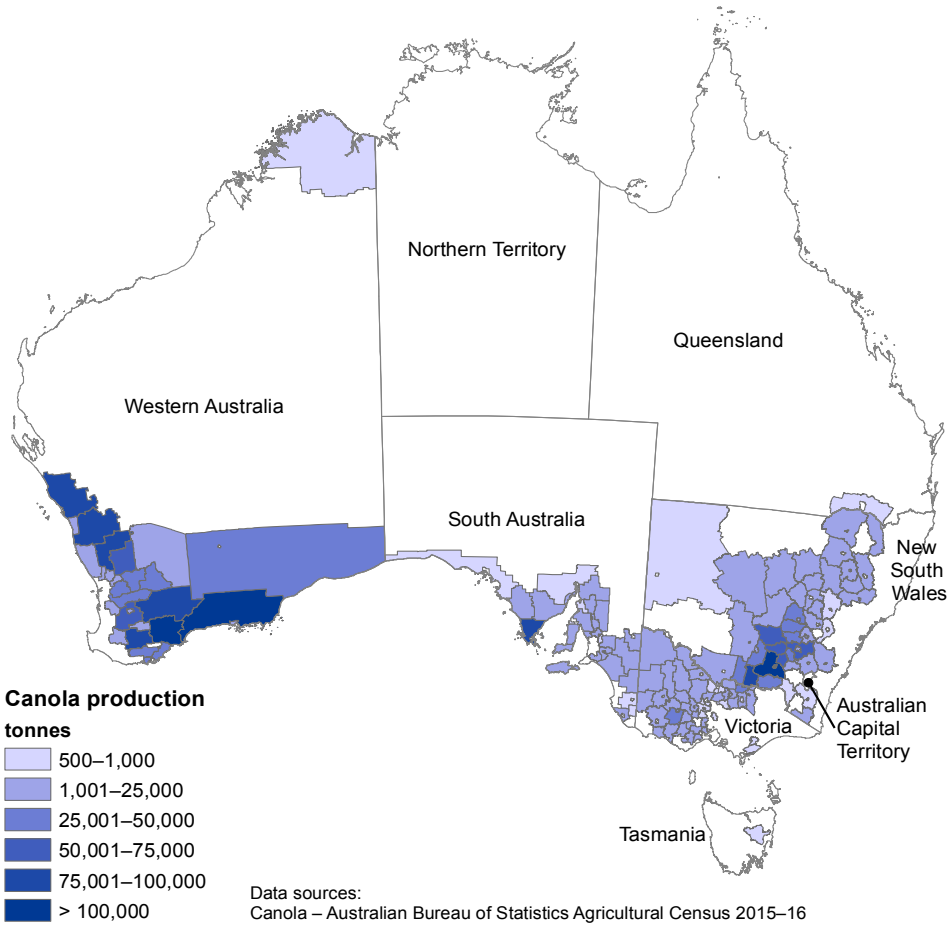


Figure 3. Average canola production 2015–16 (Source: Australian Bureau of Statistics Census 2015–16).

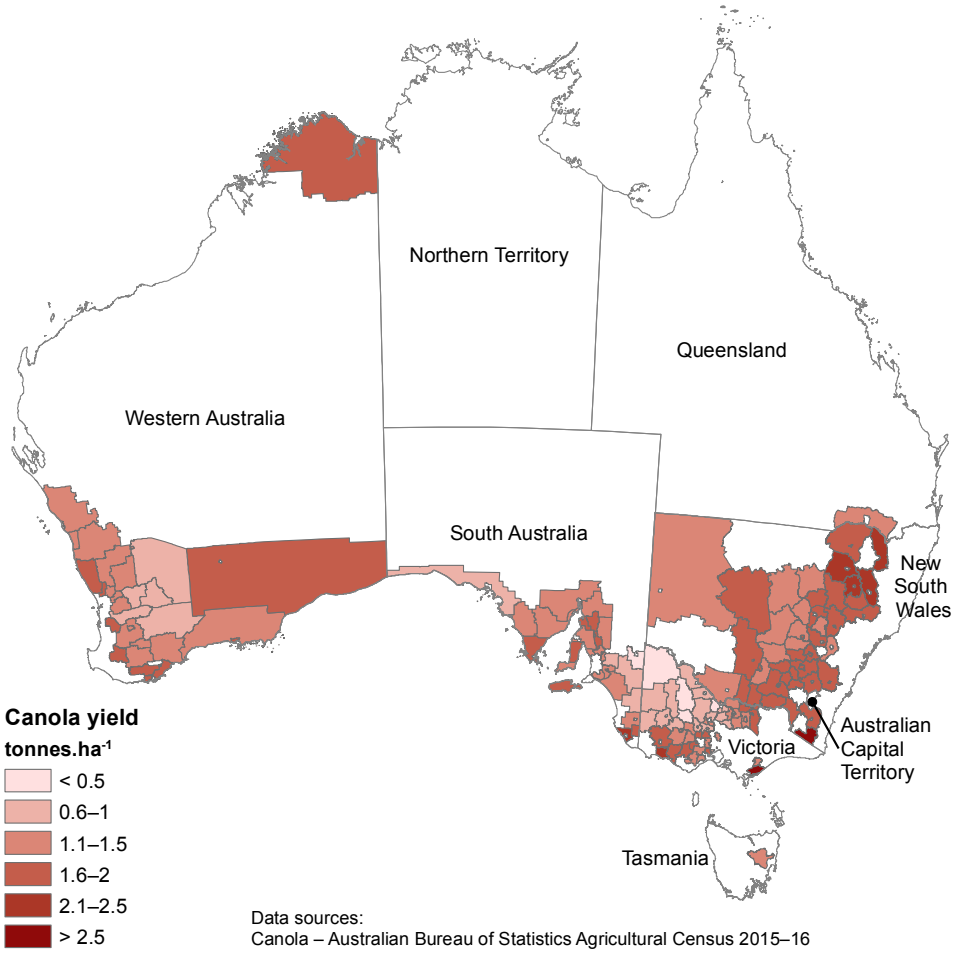
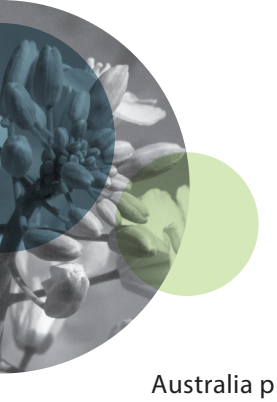


Figure 4. Average canola production 2015–16 (Source: Australian Bureau of Statistics Census 2015–16)



Yield

Australia produced an estimated 3.64 million tonnes of canola in 2017 from a harvested area of 2.65 million hectares for an average yield of 1.38 t/ha. The yield ranged from 1.03 t/ha in New South Wales (third lowest on record) to 1.67 t/ha in Victoria.

The area sown to canola increased by 14% compared with 2016, however, production decreased by 12%, reflecting the very challenging season. Regardless, total production was the fourth highest on record.

The area sown and production in each state is shown in Table 1. Final production was estimated at 3.643 million tonnes.

Table 1. Estimated Australian canola production by state in 2017
(Source: ABARES Crop Report February 2018; GIWA Crop Report February 2018; Industry estimates).

State	Area sown (hectares)	Production (tonnes)	Area harvested (hectares)	Average yield (tonnes/hectare)
New South Wales	640,000	618,000	600,000	1.03
Victoria	450,000	750,000	450,000	1.67
South Australia	260,000	375,000	250,000	1.50
Western Australia	1,376,000	1,900,000	1,347,000	1.14
Australia	2,716,000	3,643,000	2,647,000	1.38

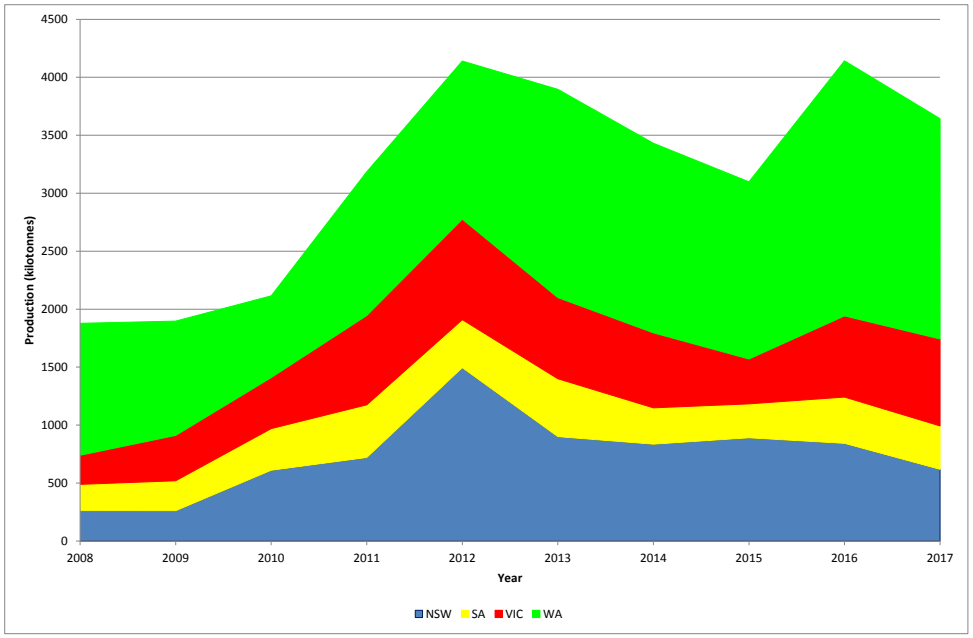
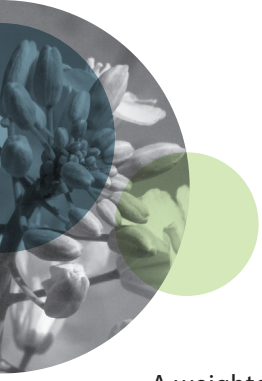


Figure 5. Canola Production in Australia 2008–2017



Australian quality parameter summary

A weighted average of each region and state was calculated based on the tonnages each site and grade represents.

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 2017

Quality parameter	Australian weighted average
Oil content, % in whole seed @ 6% moisture	46.4
Protein content, % in oil-free meal @ 10% moisture	39.4
Glucosinolates, µmoles/g in oil-free meal @ 10% moisture	15
Glucosinolates, µmoles/g in whole seed @ 6% moisture	8
Test weight, kg/hL	66.14
Oleic acid (C18:1), %[1]	61.2
Linoleic acid (C18:2), %[1]	20.3
Linolenic acid (C18:3), %[1]	10.3
Erucic acid (C22:1), %[1]	<0.1
Polyunsaturated fatty acids, %[1]	30.5
Monounsaturated fatty acids, %[1]	62.7
Saturated fatty acids, %[1]	6.8
Iodine value	115.7
Chlorophyll content, mg/kg in whole seed as received	4

[1]Fatty acids are reported as a % of total fatty acids in the oil portion of the seed.

Oil content

The average oil content for the Australian harvest in 2017 was 46.4%. This was the second highest on recorded, 0.8 percentage points lower than the 2016 maximum of 47.2%. The receival site oil content ranged from 39.2% at Nevertire in New South Wales to 46.6% at Hamilton in Victoria. The port zone oil content ranged from 46.1% at Geraldton in Western Australian to 48.8% at Esperance in Western Australia.

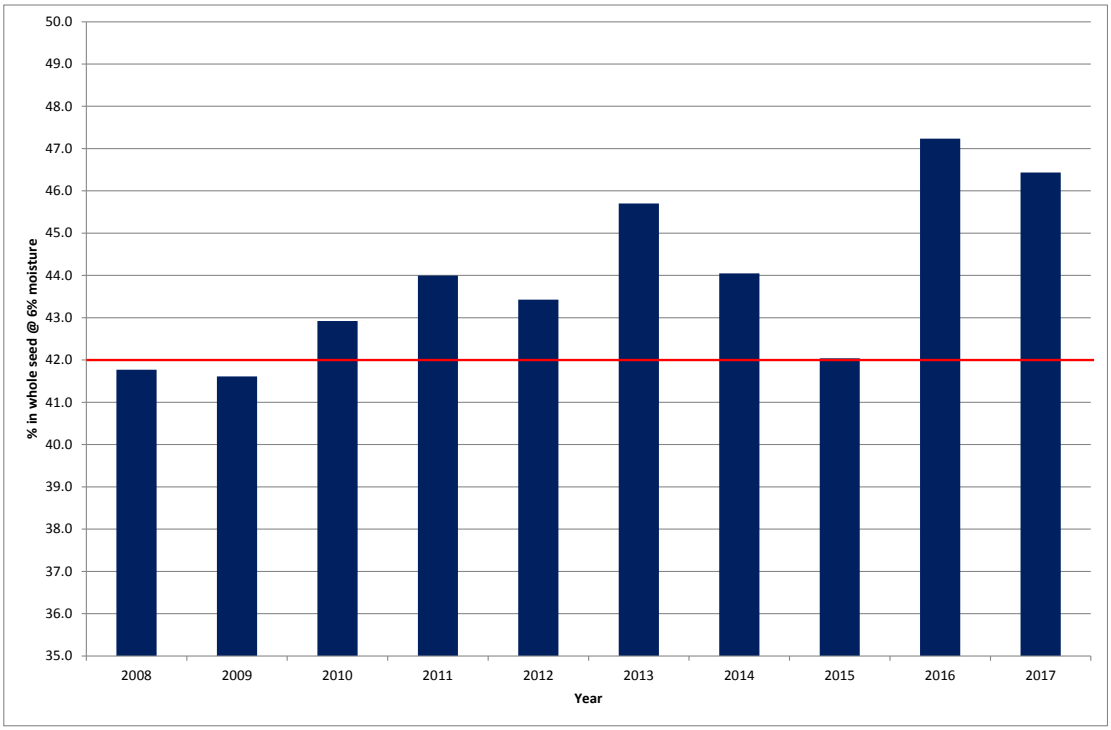
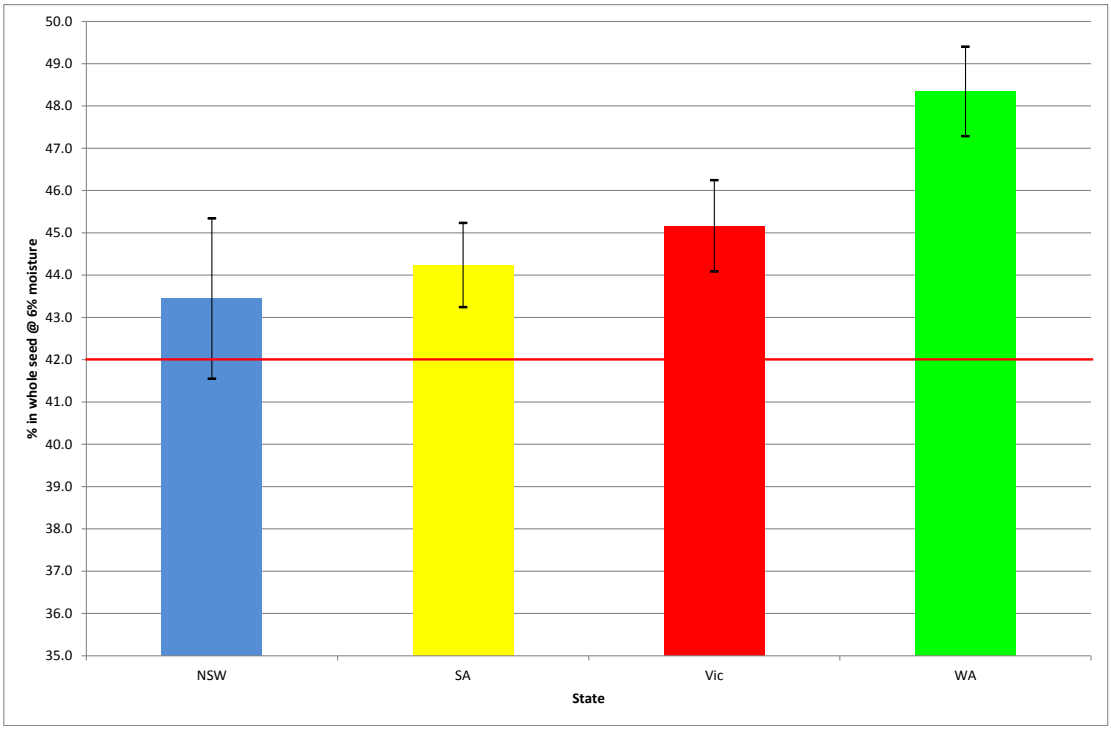


Figure 6. Average Australian oil content 2008–2017



Bars indicate the standard deviation for each state.
Red line indicates the AOF base level oil content of 42%.
2015 average was determined with NSW, SA & Vic results only.

Figure 7. Average oil content by state 2017

Protein content

The average protein content for the 2017 Australian canola harvest was 39.4% in oil-free meal. This was 1.9 percentage points higher than the 2016 harvest. Protein ranged from 37.5% at Westmere in Victoria to 46.0% at Gunnedah in New South Wales.

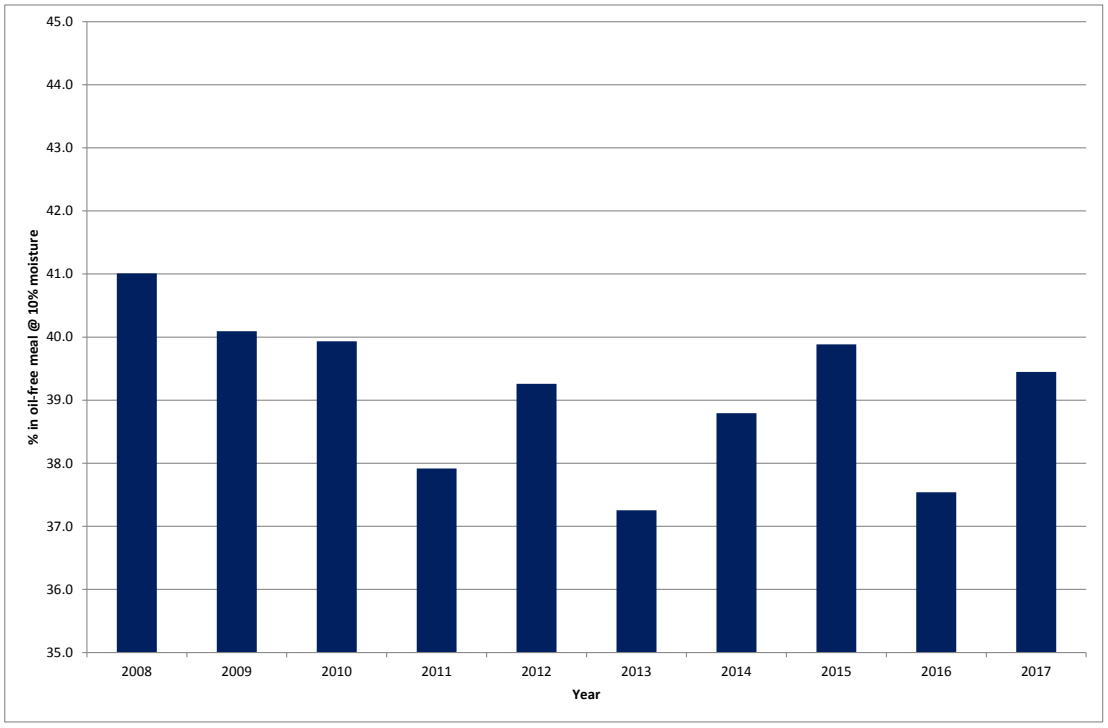
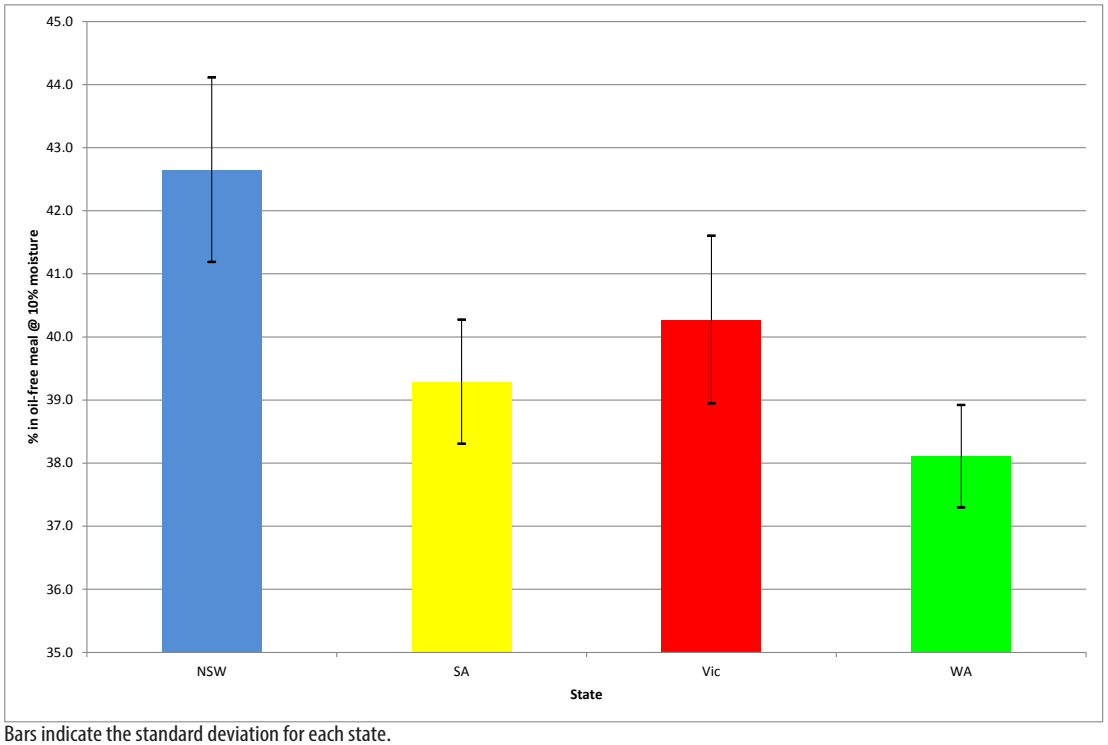


Figure 8. Average Australian protein content 2008–2017



Bars indicate the standard deviation for each state.
2015 average was determined with NSW, SA & Vic results only.

Figure 9. Average protein content by state 2017

Glucosinolate content – meal

The AOF Trade Standard sets the limit for glucosinolate content at 30 µmoles/g in oil-free meal. This is the second year glucosinolate content has been reported in oil-free meal at 10% moisture to allow comparison with the AOF Trade Standard. Glucosinolate content has also been reported at 6% moisture in whole seed in line with previous volumes of the publication. From next year, this publication will only be reporting glucosinolate content in oil-free meal.

The average glucosinolate content for the Australian harvest in 2017 was 15 µmoles/g in oil-free meal at 10% moisture.

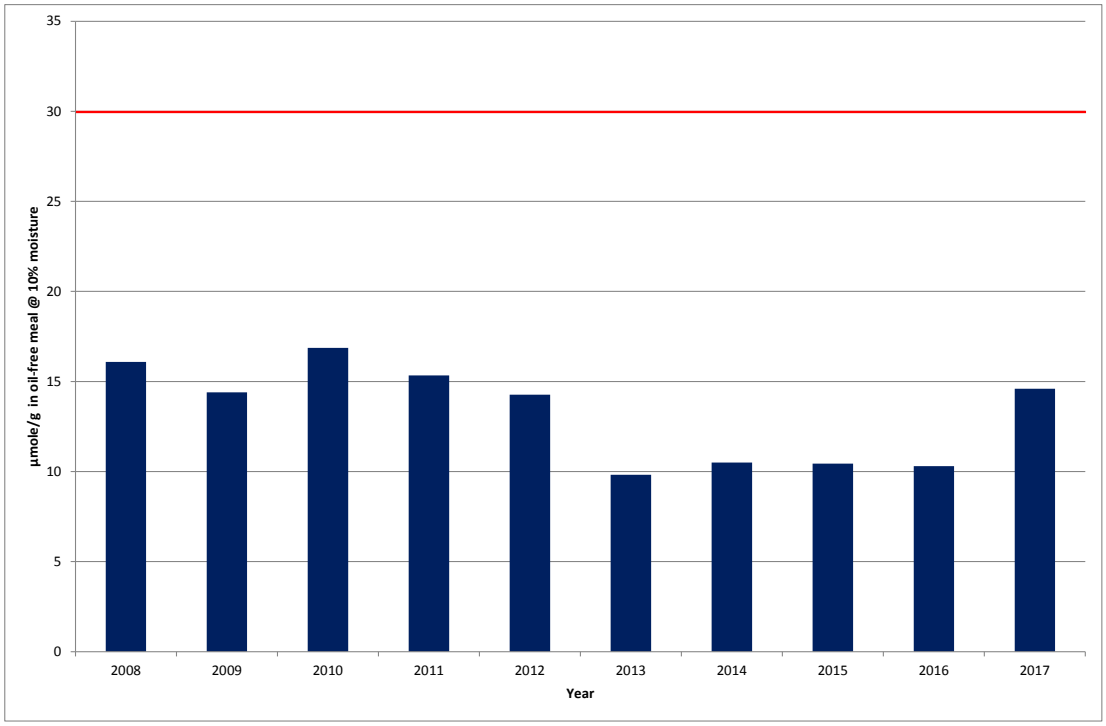
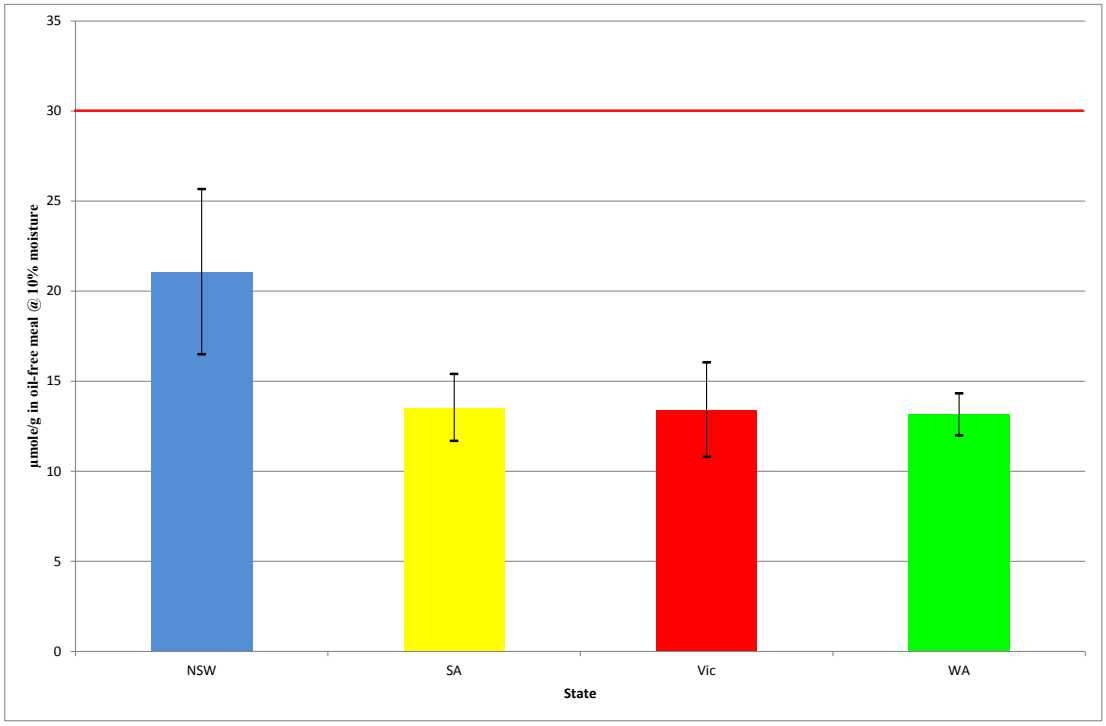


Figure 10. Average Australian glucosinolate content in meal 2008–2017



Bars indicate the standard deviation for each state.
Red line indicates the AOF limit of 30 µmoles/g in oil-free meal.
2014 and 2015 averages were determined with NSW, SA & Vic results only.

Figure 11. Average glucosinolate content in meal by state 2017

Glucosinolate content – whole seed

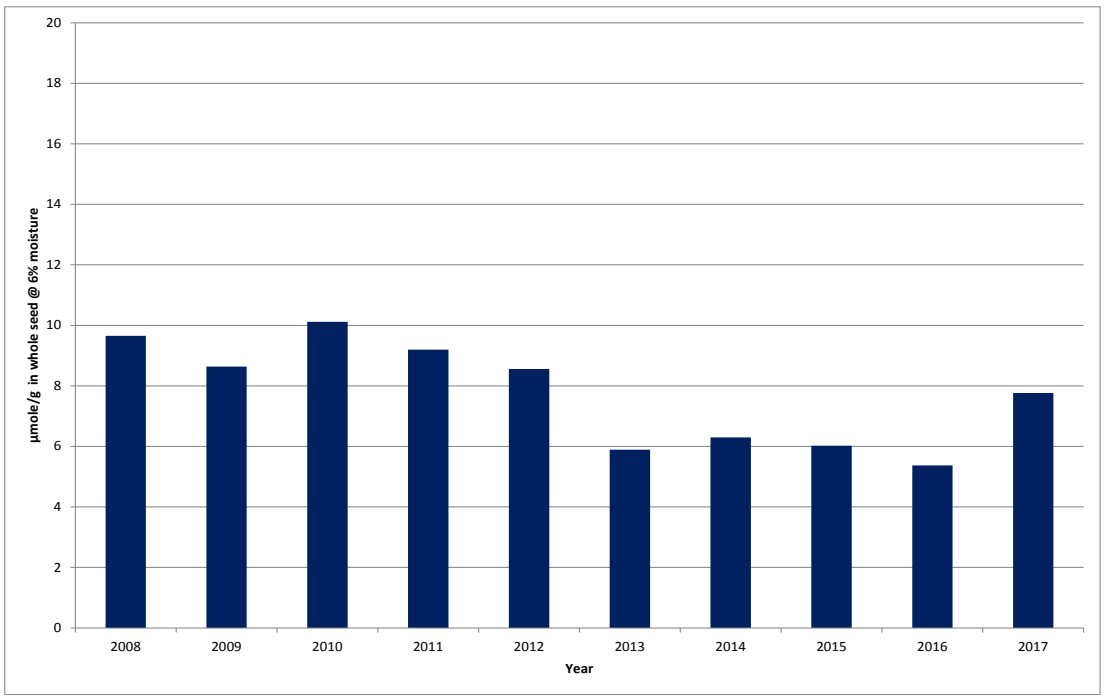
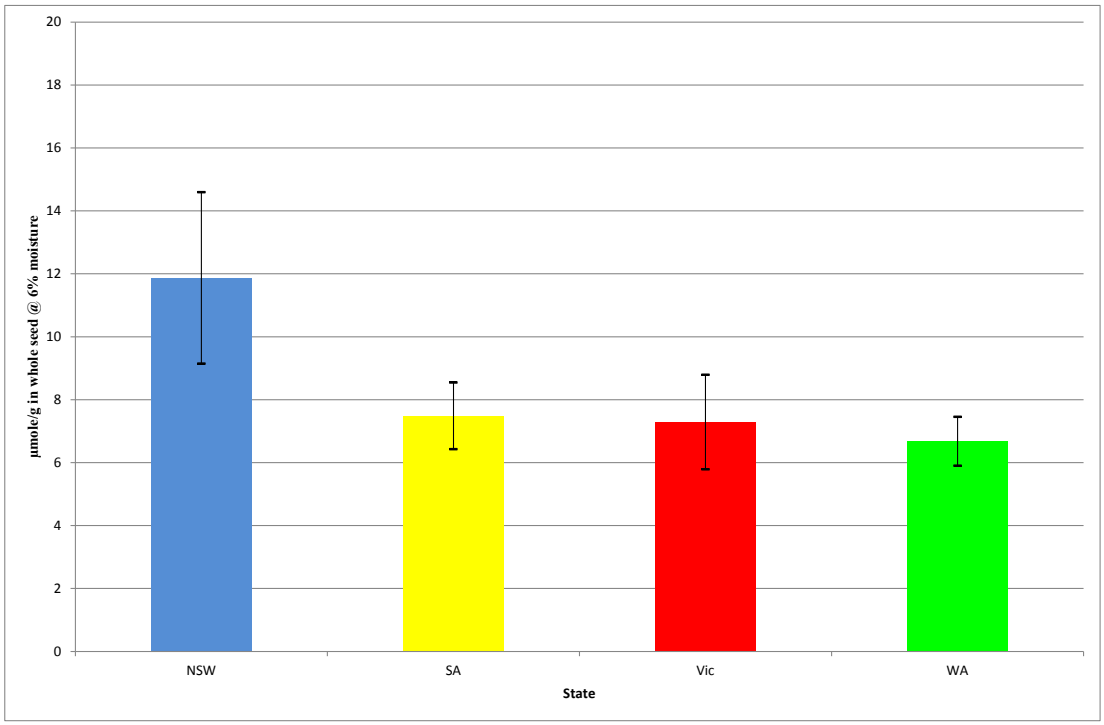


Figure 12. Average Australian glucosinolate content in whole seed 2008–2017



Bars indicate the standard deviation for each state.
2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 13. Average glucosinolate content in whole seed by state 2017Fatty acid composition

Oleic acid

The average oleic acid (C18:1) content (percentage of total fatty acids in the oil portion of seed) from the 2017 harvest was 61.2%. This was an increase of 0.7 percentage points from the 2016 harvest. Oleic acid ranged from 59.1% at Rudall in South Australia to 65.1% at Rainbow in Victoria.

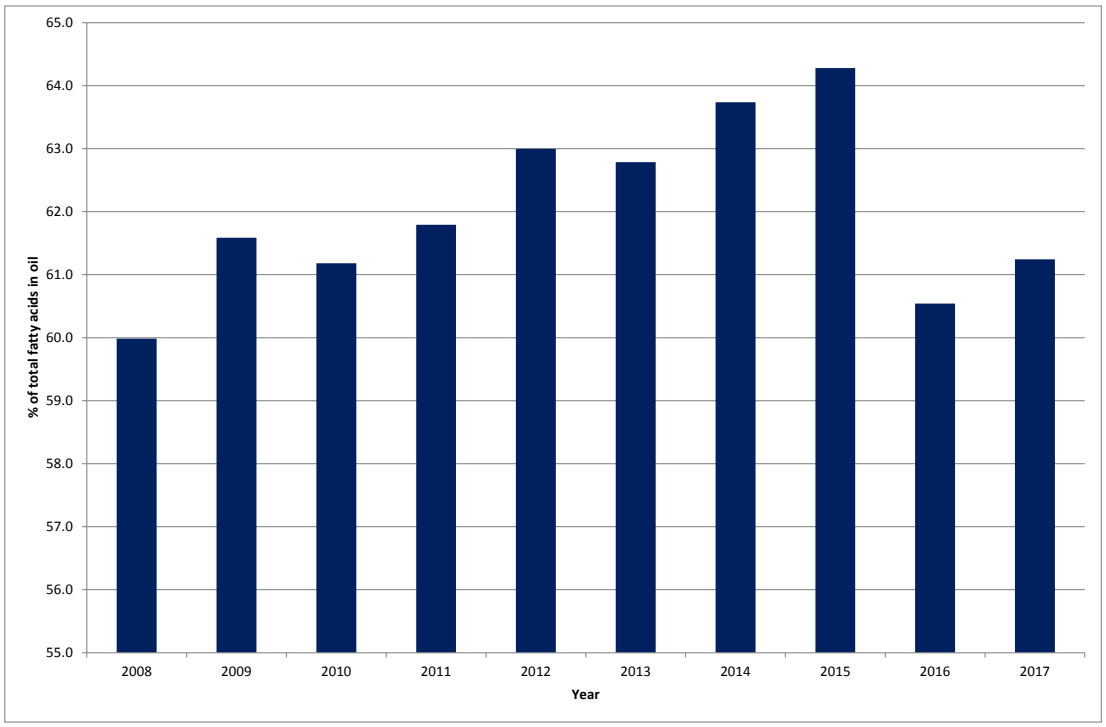
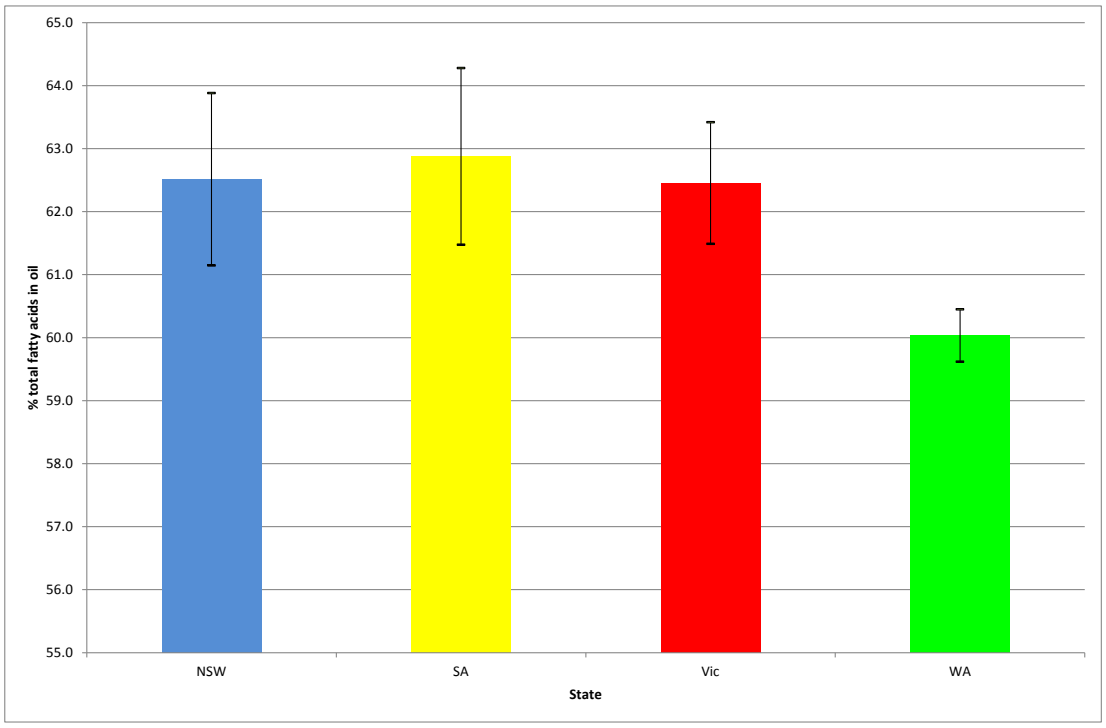


Figure 14. Average Australian percentage of oleic acid in canola oil 2008–2017



Bars indicate the standard deviation for each state.

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

Figure 15. Average percentage of oleic acid in canola oil by state 2017

Linoleic acid

The average linoleic acid (C18:2) content (percentage of total fatty acids in the oil portion of seed) from the 2017 harvest was 20.3%. This was the third highest on record and the highest since 2007. Linoleic acid ranged from 17.0% at Croppa Creek and Willow Tree in New South Wales to 23.0% at Condobolin in New South Wales.

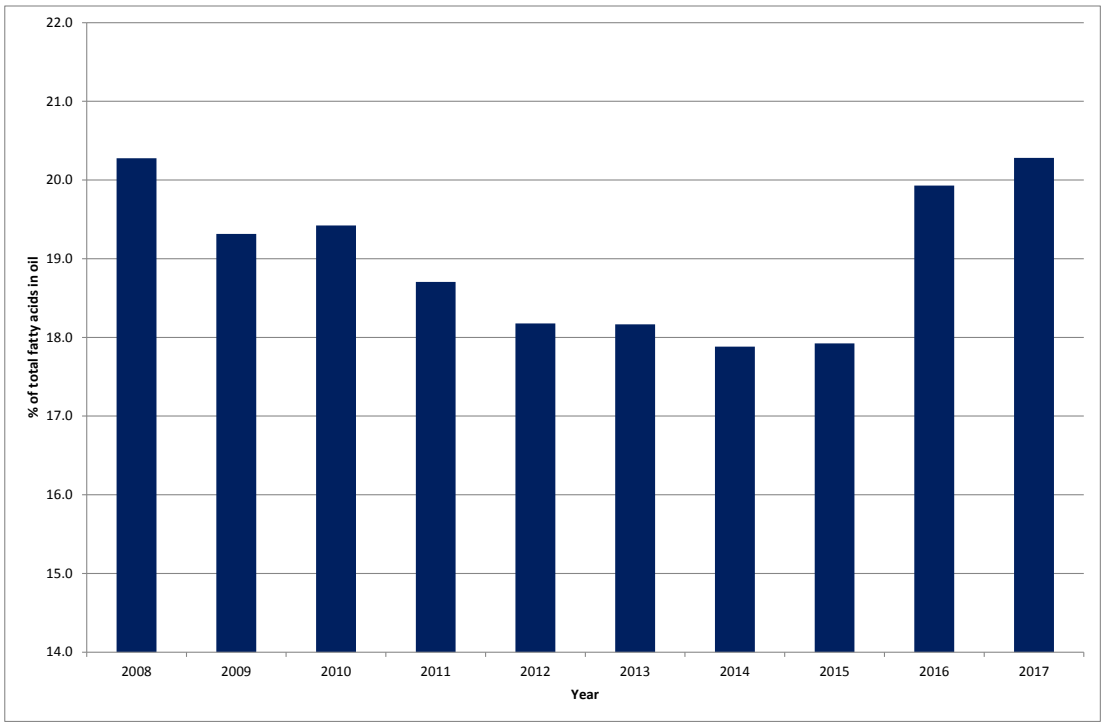
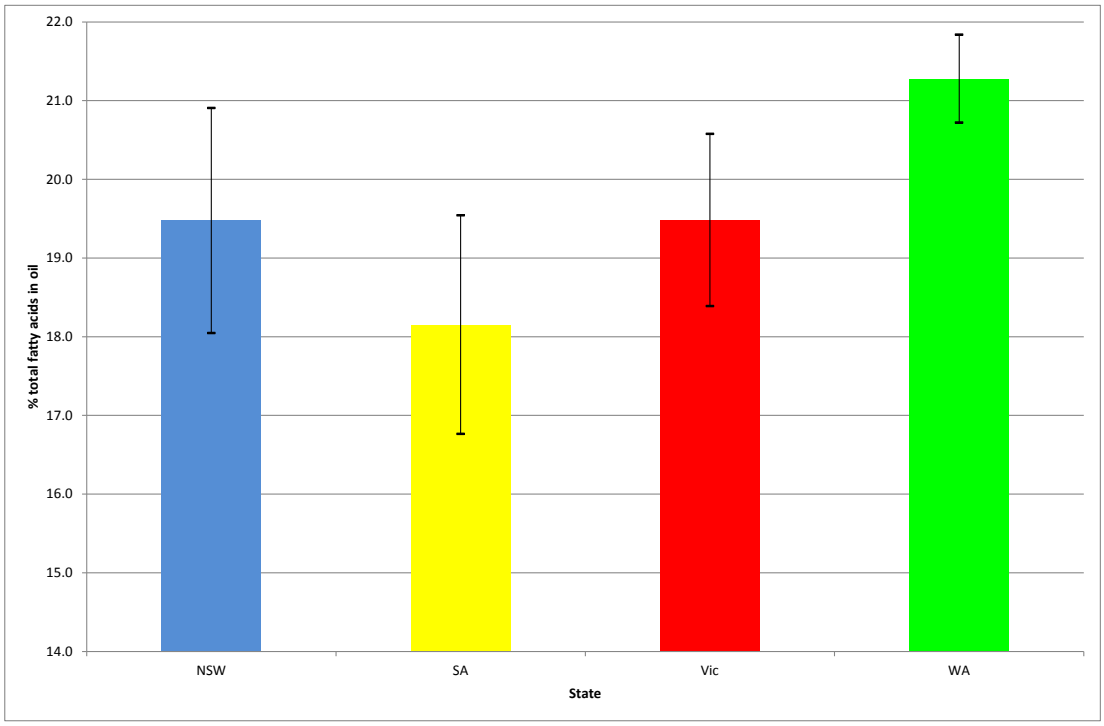


Figure 16. Average Australian percentage of linoleic acid in canola oil 2008–2017



Bars indicate the standard deviation for each state.
2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 17. Average percentage of linoleic acid in canola oil by state 2017

Linolenic acid

The average linolenic acid (C18:3) content (percentage of total fatty acids in the oil portion of seed) from the 2017 harvest was 10.3%. This was a decrease of 0.6 percentage points from the 2016 season. Linolenic acid ranged from 8.5% at Premer in New South Wales to 11.7% at Manildra in New South Wales.

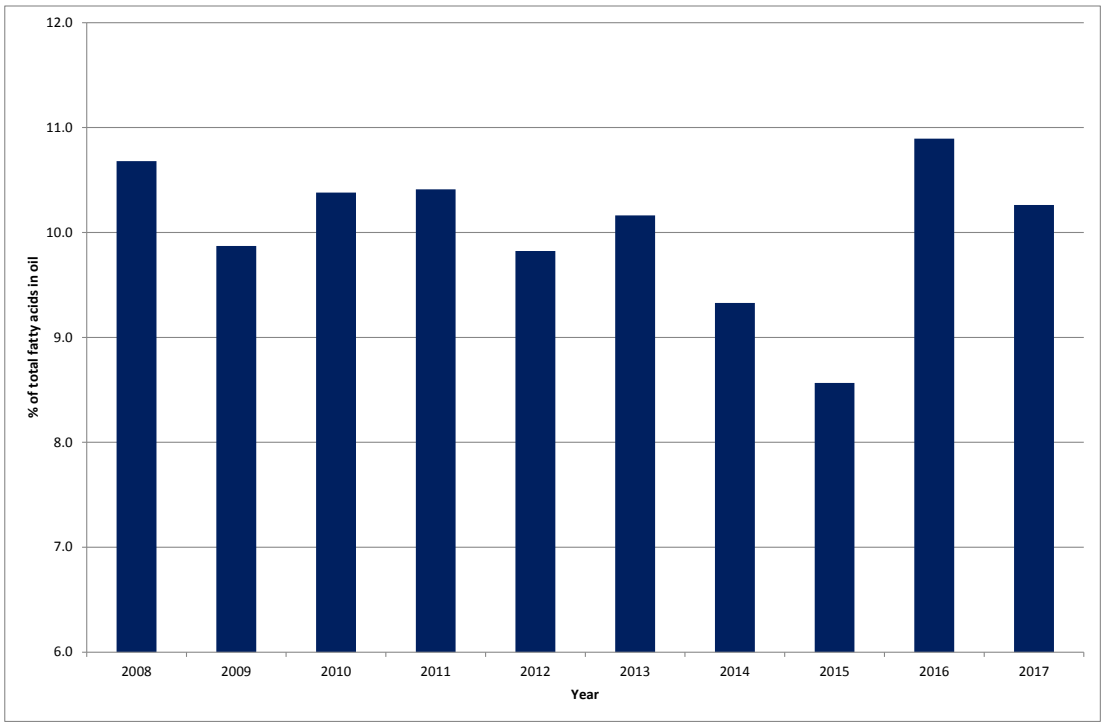
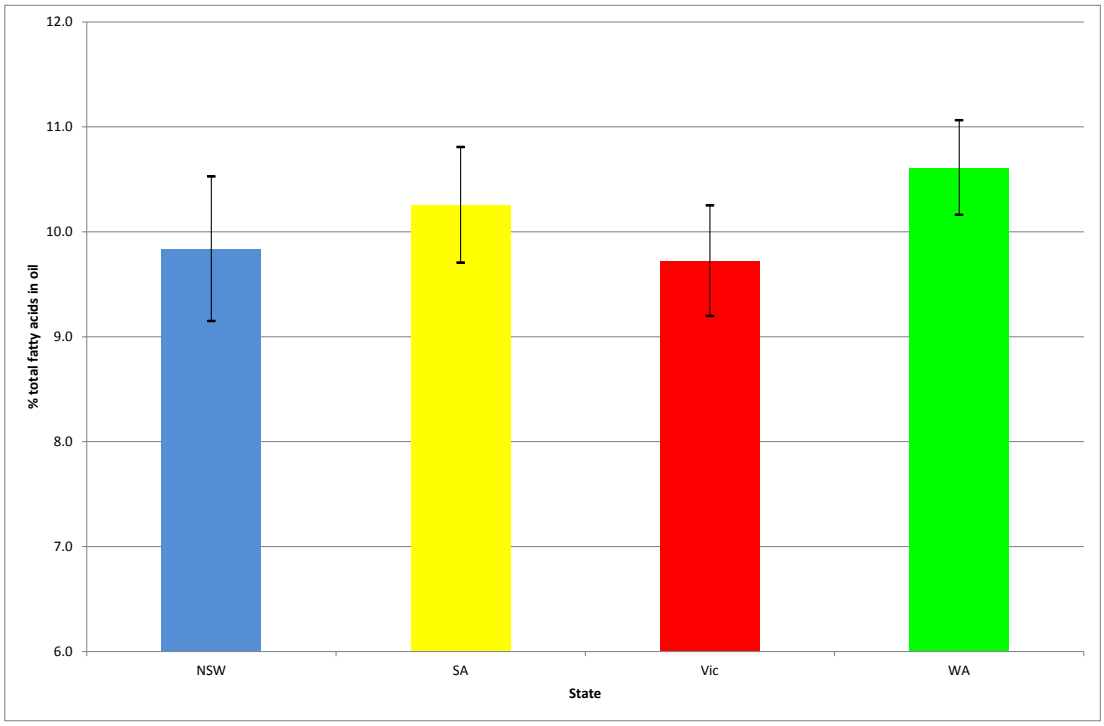


Figure 18. Average Australian percentage of linolenic acid in canola oil 2007–2017



Bars indicate the standard deviation for each state.

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

Figure 19. Average percentage of linolenic acid in canola oil by state 2017

Saturated fatty acids

The average saturated fatty acids content (percentage of total fatty acids in the oil portion of seed) from the 2017 harvest was 6.8%. This was the second lowest on record, after the 6.7% recorded in 1999. Saturated fatty acids ranged from 6.4% at Bribbaree in New South Wales to 8.1% at Croppa Creek in New South Wales.

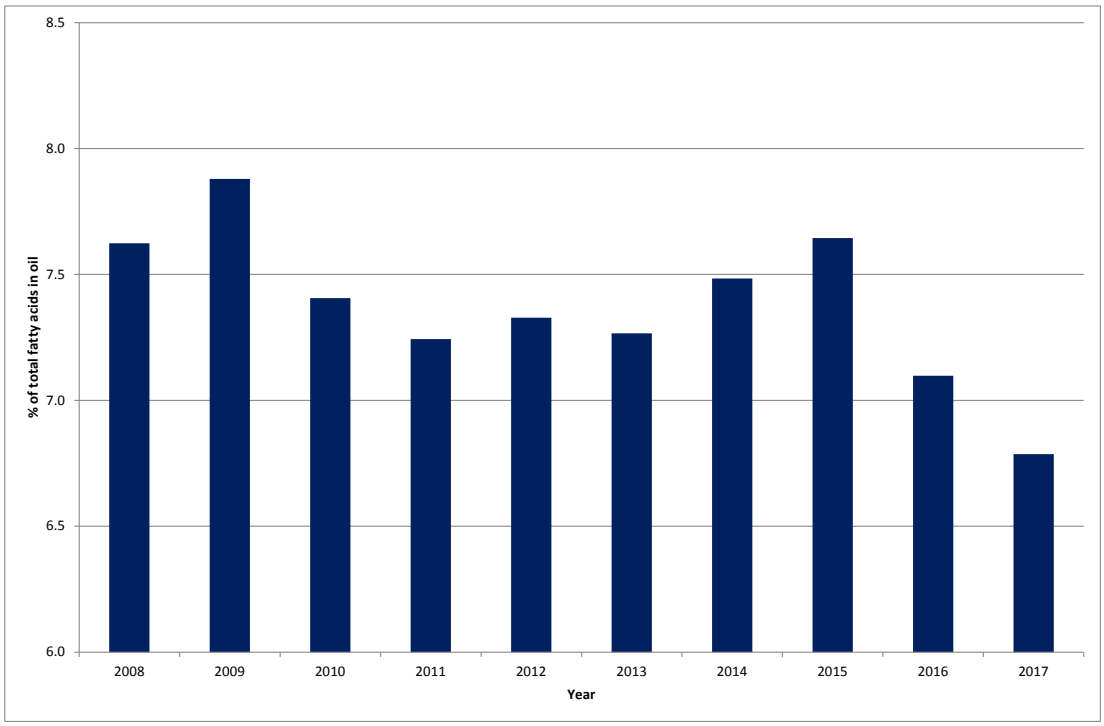
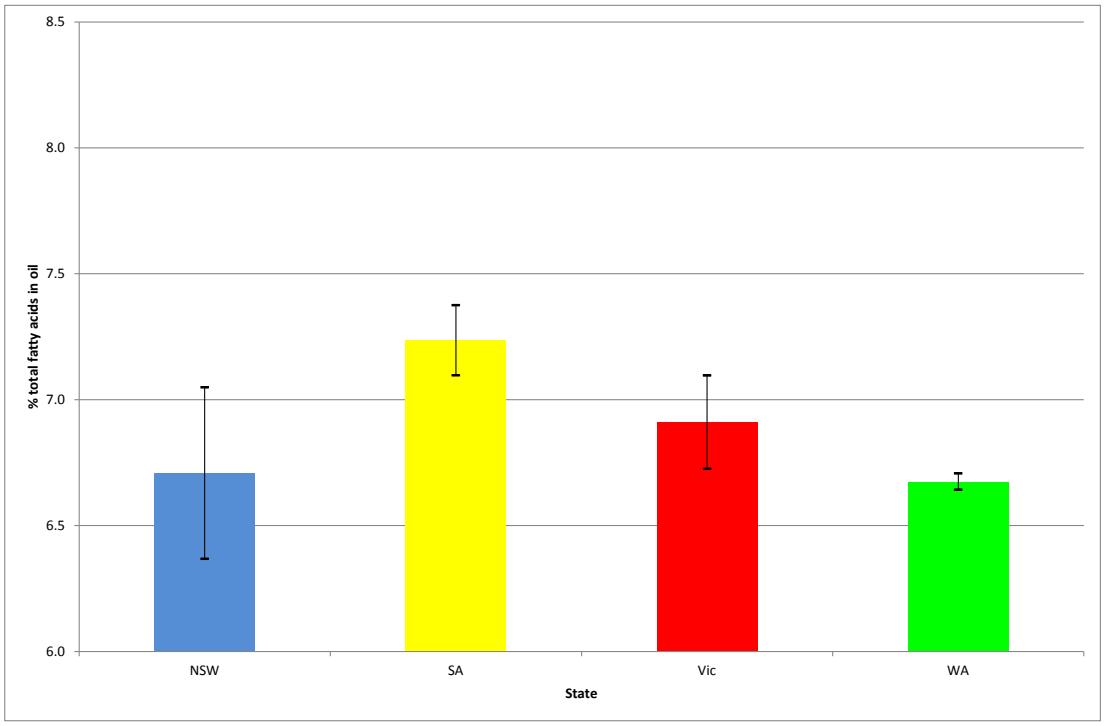


Figure 20. Average Australian percentage of saturated fatty acids in canola oil 2008–2017

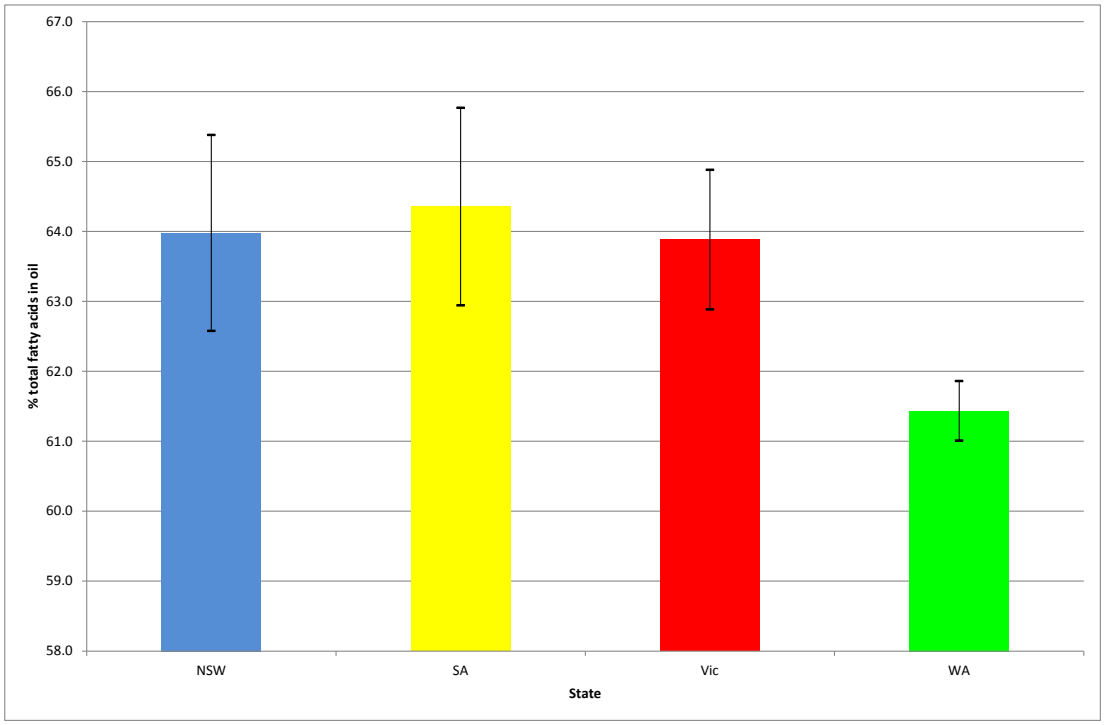


Bars indicate the standard deviation for each state.
2014 and 2015 averages were determined with NSW, SA and Vic results only.

Figure 21. Average percentage of saturated fatty acids in canola oil by state 2017

Monounsaturated fatty acids

The average monounsaturated fatty acids content (percentage of total fatty acids in the oil portion of seed) from the 2017 harvest was 62.7%. This was an increase of 0.6 percentage points from the 2016 harvest. Monounsaturated fatty acids ranged from 60.6% at Rudall in South Australia to 66.7% at Rainbow in Victoria.

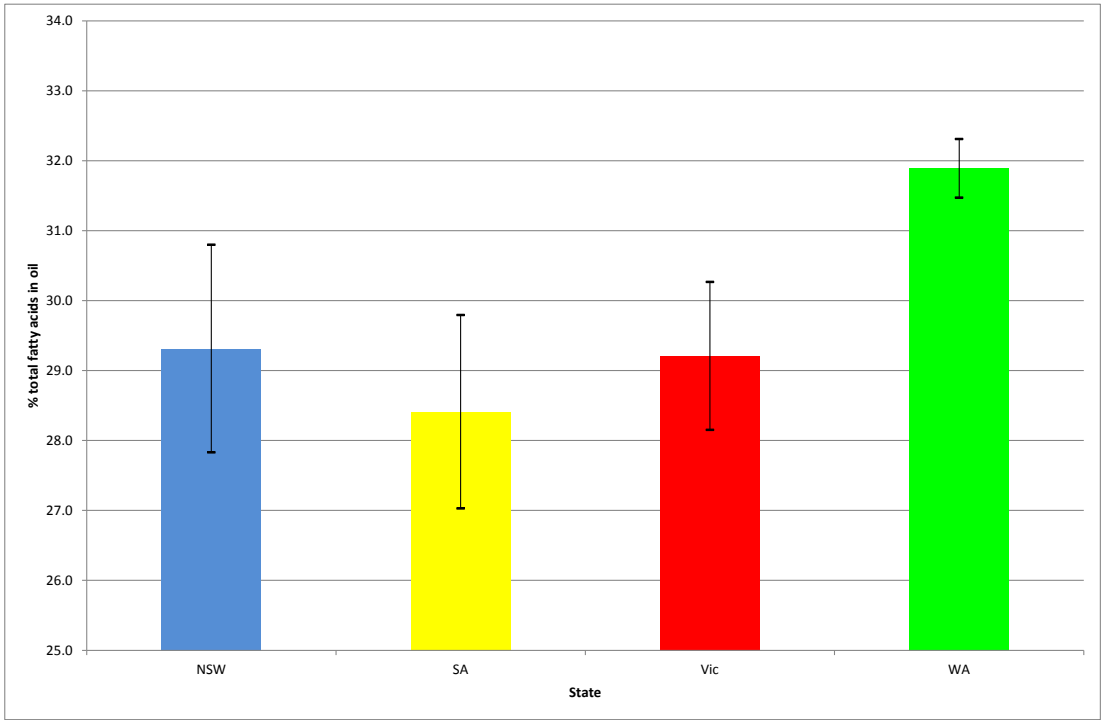


Bars indicate the standard deviation for each state.

Figure 22. Average percentage of monounsaturated fatty acids in canola oil by state 2017.

Polyunsaturated fatty acids

The average polyunsaturated fatty acids content (percentage of total fatty acids in the oil portion of seed) from the 2017 harvest was 30.5%. This was a decrease of 0.3 percentage points from the 2016 harvest. Polyunsaturated fatty acids ranged from 26.0% at Croppa Creek in New South Wales and Rainbow in Victoria to 32.5% at Condobolin in New South Wales. The port zone of Esperance in Western Australia also recorded 32.5% polyunsaturated fatty acids.



Bars indicate the standard deviation for each state.

Figure 23. Average percentage of polyunsaturated fatty acids in canola oil by state 2017

Iodine value

The average iodine value in the oil portion of the seed form the 2017 harvest was 115.7. This was a decrease of 0.5 from the 2016 harvest. Iodine value ranged from 109.4 at Croppa Creek in New South Wales to 116.7 at Condobolin in New South Wales. The four port zones in Western Australia ranged from 116.7 (Geraldton) to 118.2 (Esperance).

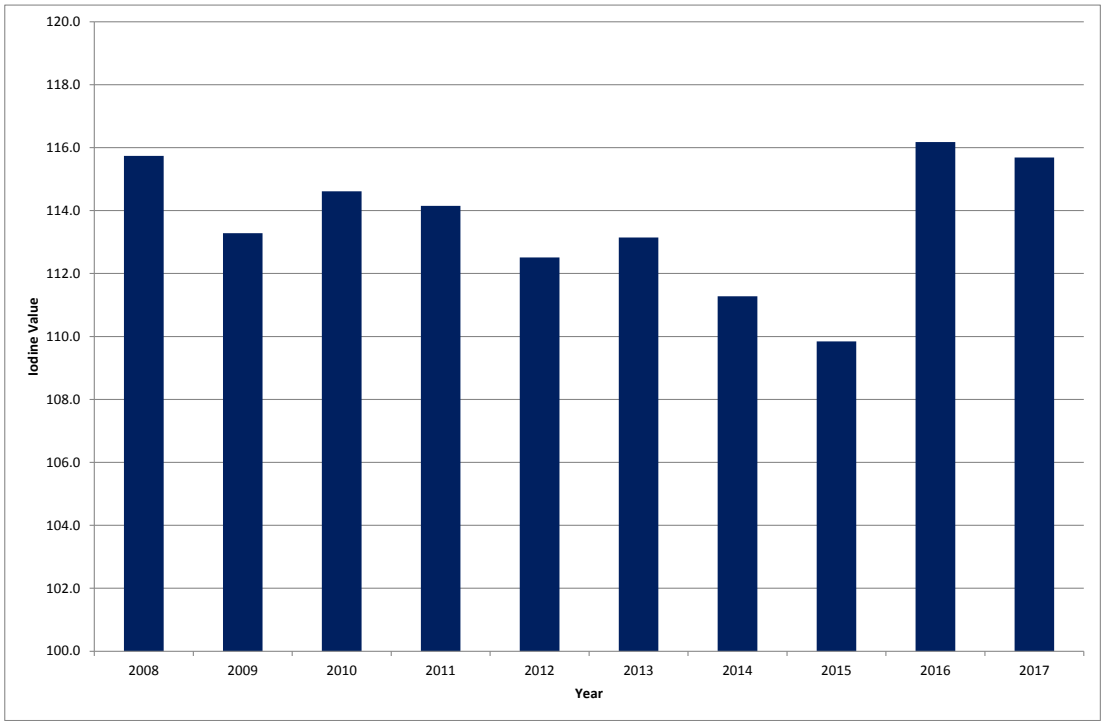
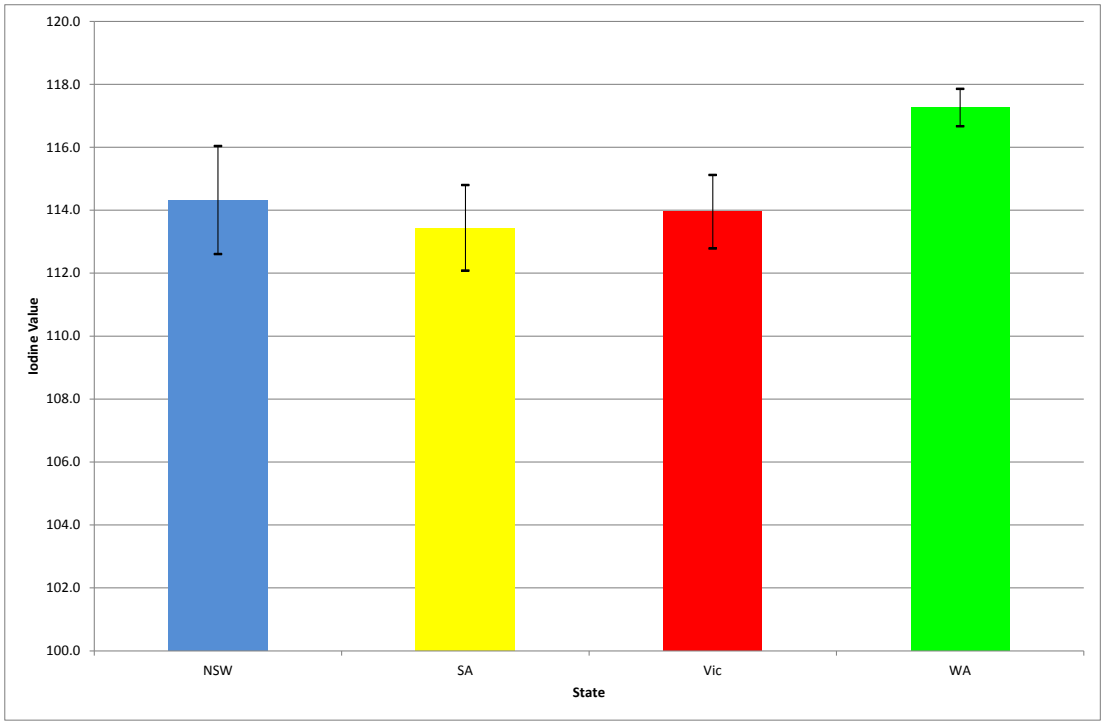
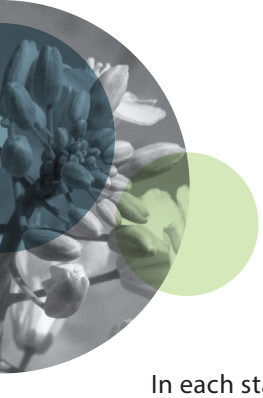


Figure 24. Average Australian iodine value in canola oil 2008 – 2017



Bars indicate the standard deviation for each state.
2014 & 2015 averages were determined with NSW, SA & Vic results only.

Figure 25. Average iodine value in canola oil by state 2017



Quality data by state

In each state the receival sites are grouped into Zones and Regions by the bulk handlers. Results are reported according to these zones and regions.

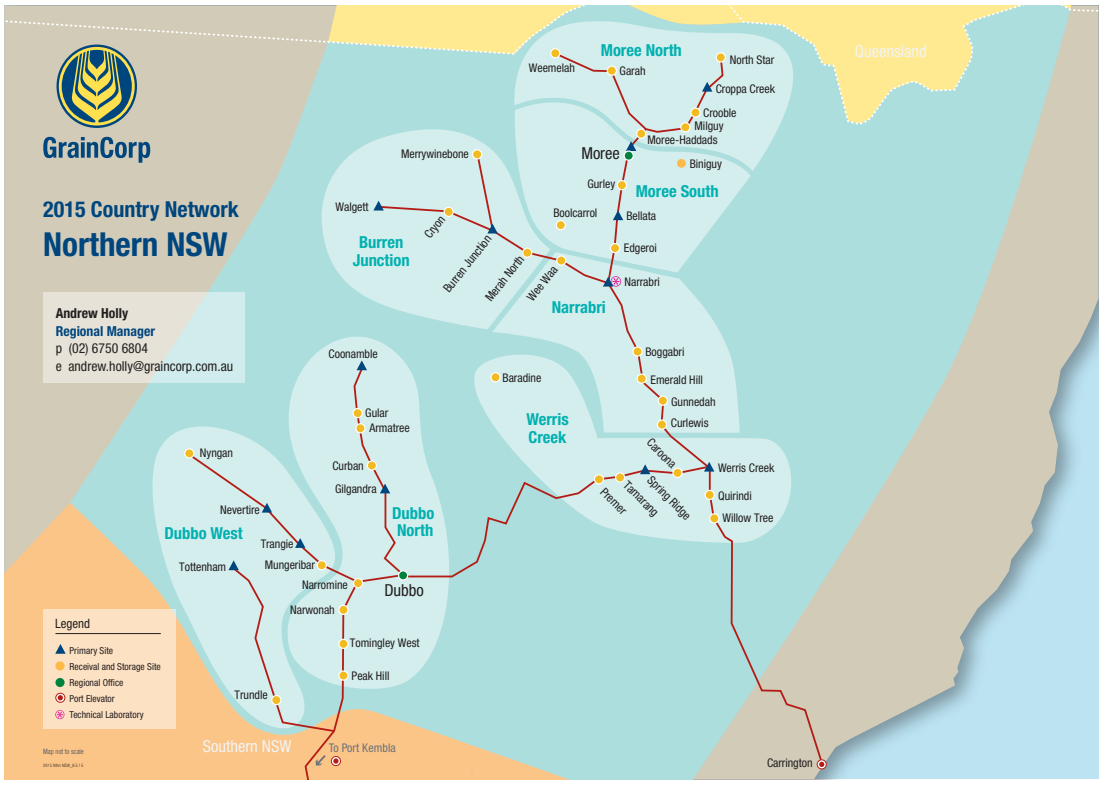


Figure 26. GrainCorp map of Northern NSW regions (Source: **http://www.graincorp.com.au**)

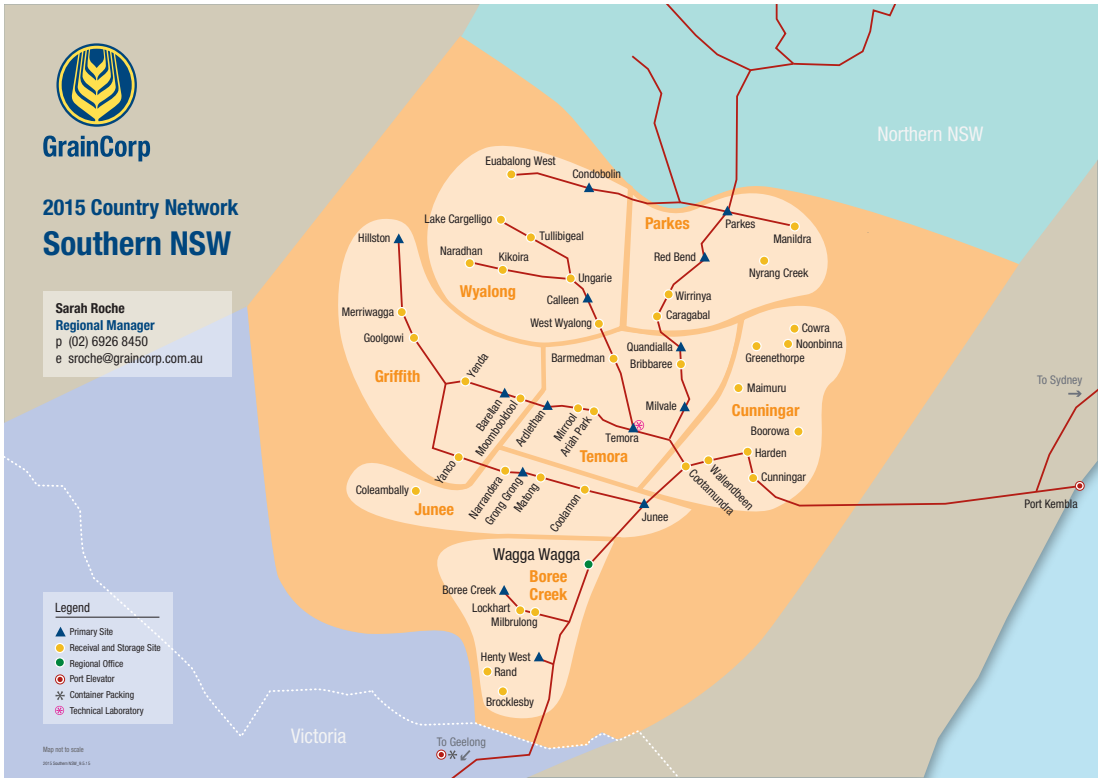


Figure 27. GrainCorp map of Southern NSW regions (Source: **http://www.graincorp.com.au**)

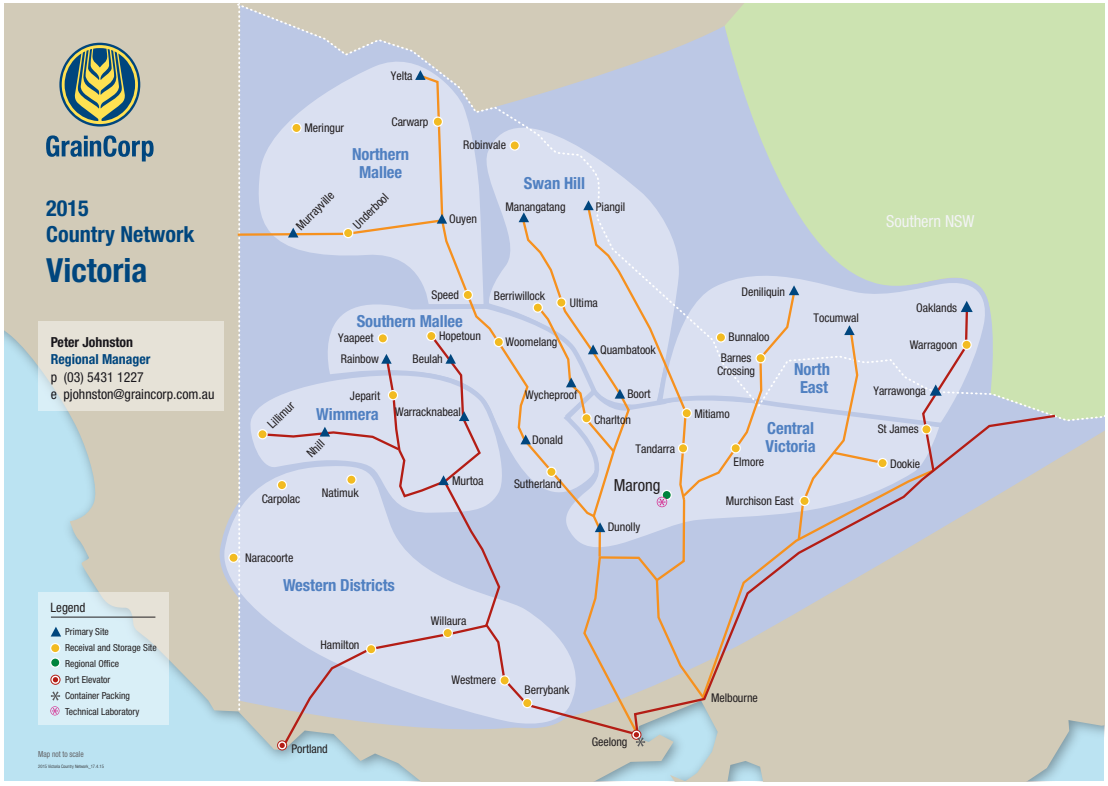


Figure 28. GrainCorp map of Victorian regions (Source: **http://www.graincorp.com.au**)

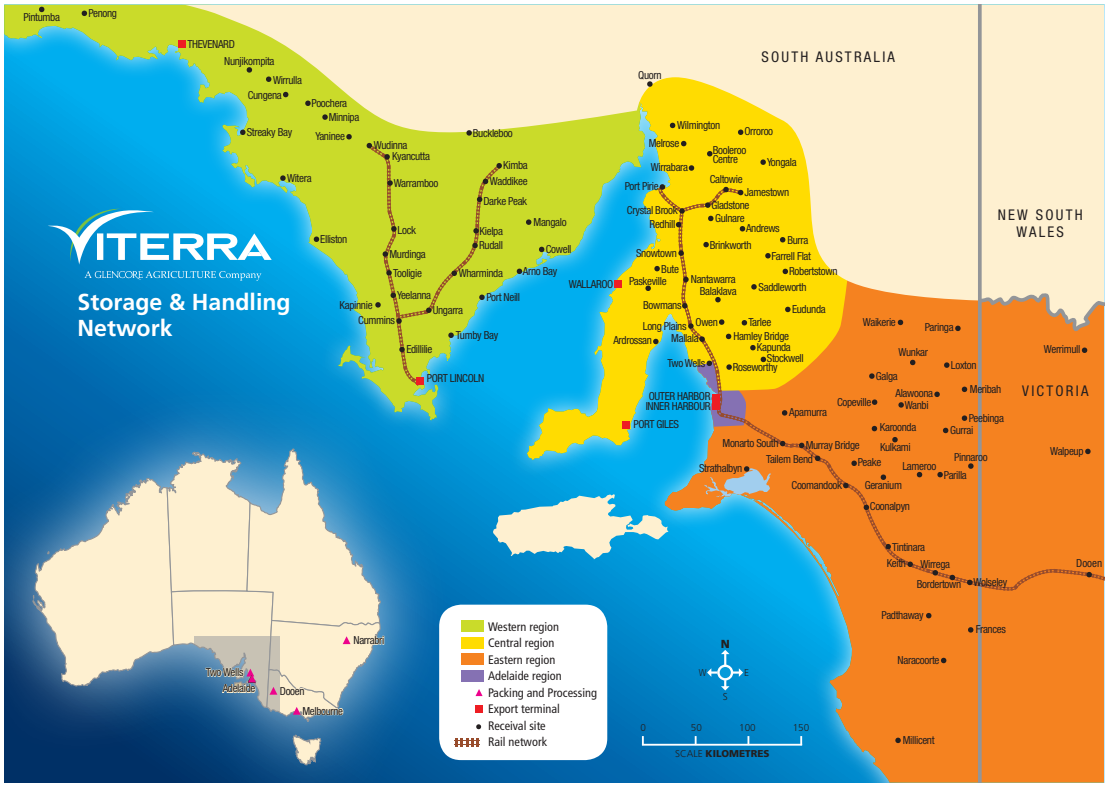


Figure 29. Viterra Storage & Handling Network map
(Source: **http://www.viterra.com.au/wp-content/uploads/2017/07/Map.pdf**)

RECEIVAL SITE MAP

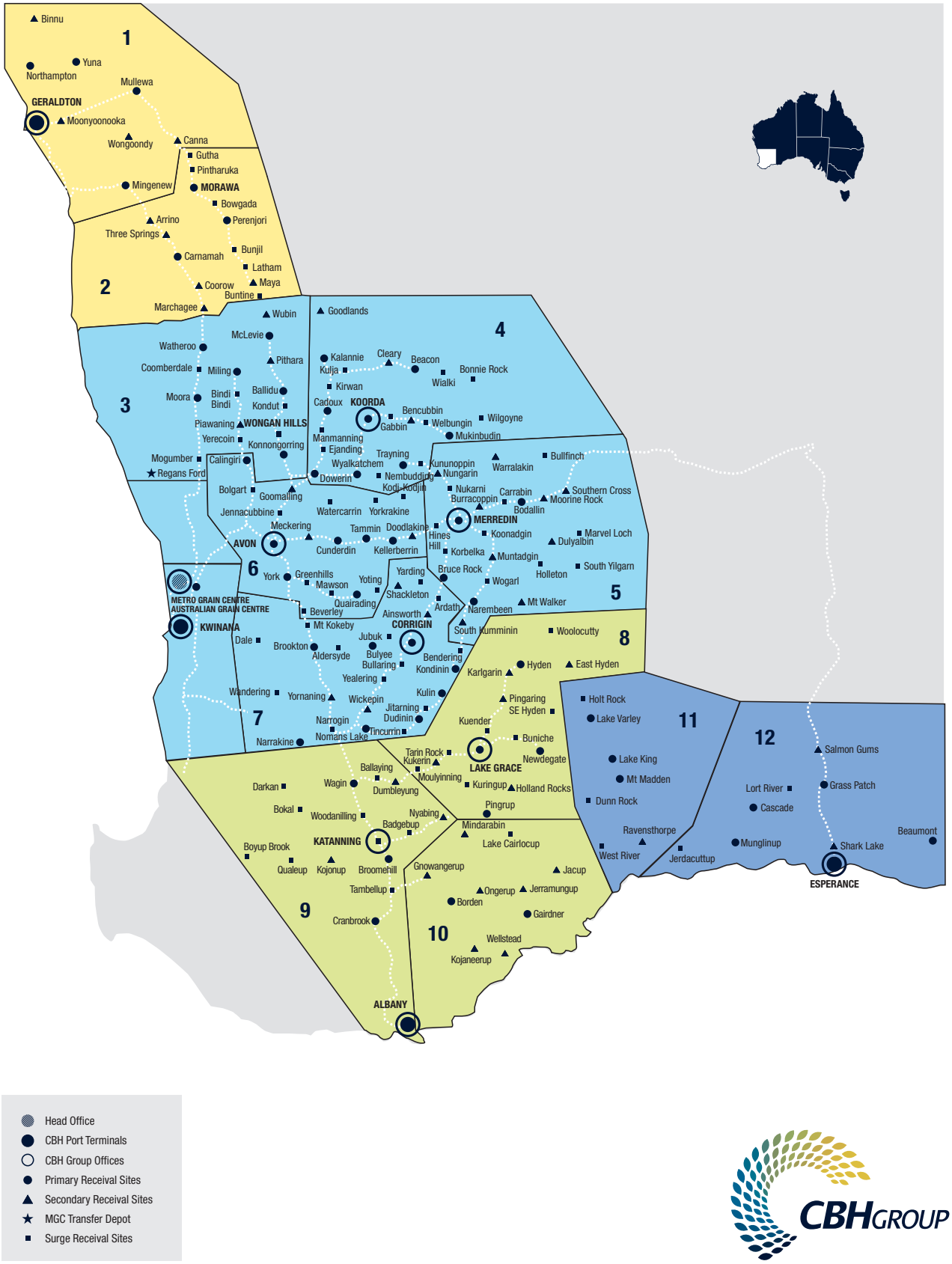


Figure 30. CBH Group receival site map
(Source: **https://www.cbh.com.au/~/media/files/cbh%20website/documents/growers/growers%20-%20harvest%20information/receival%20site%20map.ashx**)

Table 3. Quality data – New South Wales

Region/zone/site	Grade	Oil	Protein	Glucosinolates		Test weight
		%[1]	%[2]	µmoles/g[3]	µmoles/g[4]	kg/hL[5]
Northern NSW						
Dubbo North						
Gilgandra	CAN	40.3	44.0	19	11	67.88
Dubbo West						
Nevertire	CAN	39.2	44.6	22	13	67.25
Trangie	CAN	42.5	42.9	19	11	65.63
Moree North						
Croppa Creek	CAN	40.6	42.3	19	11	67.25
Moree	CAN	39.5	43.5	21	13	65.25
Narrabri						
Gunnedah	CAN	40.3	46.0	18	11	63.75
Werris Creek						
Premer	CAN	42.6	43.2	16	9	67.00
Willow Tree	CAN	40.8	41.9	13	8	65.50
Northern NSW weighted average		**40.6**	**43.7**	**18**	**11**	**66.13**
Southern NSW						
Boree Creek						
Boree Creek	CAN	42.2	43.2	21	12	65.94
Henty West	CAN	45.0	41.3	18	10	66.00
Milbrulong	CAN	42.8	43.3	20	11	65.63
Rand	CAN	46.3	42.0	20	11	64.63
Cunningar						
Boorowa	CAN	45.0	40.2	33	18	64.00
Cootamundra	CAN	45.8	39.9	27	15	63.63
Cowra	CAN	44.4	42.5	15	8	65.25
Cunningar	CAN	45.1	41.9	13	7	65.13
Greenthorpe	CAN	44.5	42.8	12	6	66.00
Maimuru	CAN	44.9	40.4	25	14	63.63
Griffith						
Barellan	CAN	41.9	43.0	26	15	65.88
Junee						
Junee	CAN	44.4	42.1	21	11	65.75
Narrandera	CAN	41.0	42.7	19	11	66.00
Parkes						
Caragabal	CAN	42.4	44.5	20	11	64.75
Manildra	CAN	42.4	45.9	20	12	65.13
Parkes Sub	CAN	42.0	45.5	22	12	65.00
Red Bend	CAN	42.3	42.7	26	15	66.00
Wirrinya	CAN	41.9	43.2	20	12	66.00
Temora						
Ardlethan	CAN	39.5	43.0	29	18	66.25
Bribbaree	CAN	42.6	44.0	24	14	65.50
Milvale	CAN	42.0	45.0	25	15	64.13
Temora Sub	CAN	41.9	43.2	23	13	64.33
Wyalong						
Calleen	CAN	39.8	44.1	24	15	65.13
Condobolin	CAN	42.9	43.5	23	13	65.13
Wyalong	CAN	42.3	44.4	25	14	66.25
Southern NSW weighted average		**43.7**	**42.6**	**21**	**12**	**65.11**
NSW weighted average		**43.4**	**42.7**	**21**	**12**	**65.18**
NSW minimum		**39.2**	**39.9**	**12**	**6**	**63.63**
NSW maximum		**46.3**	**46.0**	**33**	**18**	**67.88**

[1] % in whole seed @ 6% moisture, [2] % in oil-free meal @ 10% moisture, [3] µmoles/g in oil-free meal @ 10% moisture,
[4] µmoles/g in whole seed @ 6% moisture, [5] kilograms/ hectolitre.

Table 4. Quality data – South Australia

Region/zone/site	Grade	Oil	Protein	Glucosinolates		Test weight
		%[1]	%[2]	µmoles/g[3]	µmoles/g[4]	kg/hL[5]
Adelaide						
Port Adelaide	CANO	44.2	39.4	12	6	65.88
Adelaide weighted average		**44.2**	**39.4**	**12**	**6**	**65.88**
Central						
Bowmans	CANO	43.6	38.9	12	7	66.13
Gladstone	CANO	42.1	41.5	15	9	66.88
Port Giles	CANO	44.4	39.0	9	5	67.25
Roseworthy	CANO	44.3	38.7	11	6	65.75
Central weighted average		**43.6**	**39.5**	**12**	**7**	**66.31**
Eastern						
Adelaide						
Bordertown	CANO	44.7	38.2	11	6	65.38
Frances	CANO	45.4	39.7	13	7	65.50
Keith	CANO	43.4	38.0	11	6	65.50
Tailem Bend	CANO	45.3	38.4	15	8	65.63
Wolseley	CANO	44.7	39.3	14	8	65.63
Western Victoria						
Dooen	CANO	45.1	40.0	13	7	67.00
Eastern weighted average		**45.0**	**38.8**	**14**	**8**	**65.85**
Western						
Cummins	CANO	44.4	39.3	15	8	66.63
Port Lincoln	CANO	44.6	39.3	15	8	66.75
Rudall	CANO	42.0	41.0	14	8	67.88
Tumby Bay	CANO	43.5	40.7	13	7	67.88
Western weighted average		**44.2**	**39.6**	**15**	**8**	**66.88**
SA weighted average		**44.2**	**39.3**	**14**	**7**	**66.32**
SA minimum		**42.0**	**38.0**	**9**	**5**	**65.38**
SA maximum		**45.4**	**41.5**	**15**	**9**	**67.88**

[1] % in whole seed @ 6% moisture, [2] % in oil-free meal @ 10% moisture, [3] µmoles/g in oil-free meal @ 10% moisture,
[4] µmoles/g in whole seed @ 6% moisture, [5] kilograms/ hectolitre.

Table 5. Quality data – Victoria

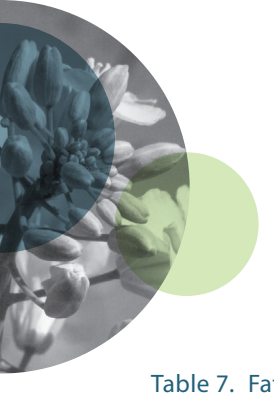
Region/zone/site	Grade	Oil	Protein	Glucosinolates		Test weight
		%[1]	%[2]	µmoles/g[3]	µmoles/g[4]	kg/hL[5]
Central Victoria						
Berrybank	CAN	46.1	38.9	11	6	63.50
Dunolly	CAN	45.1	40.4	14	8	65.25
Elmore	CAN	45.5	40.6	11	6	64.88
Mitiamo	CAN	43.7	42.4	14	8	66.13
Murchison East	CAN	45.4	40.5	16	9	66.00
Westmere	CAN	46.3	37.5	9	5	66.38
North-east						
Barnes Crossing	CAN	43.7	41.7	17	10	65.75
Deniliquin	CAN	44.7	41.4	18	10	65.88
Dookie	CAN	46.1	40.3	15	8	64.75
Oaklands	CAN	44.8	40.4	15	8	64.38
Oaklands	CANG	43.4	41.1	21	12	65.25
Tocumwal	CAN	44.4	41.4	16	9	65.00
Yarrawonga	CAN	45.8	41.9	16	9	64.63
Northern Mallee						
Ouyen	CAN	45.6	38.6	13	7	67.00
Southern Mallee						
Bealah	CAN	42.8	43.5	14	8	65.75
Donald	CAN	43.4	41.2	15	8	66.75
Rainbow	CAN	42.8	40.7	11	6	65.50
Swan Hill						
Boort	CAN	44.9	40.8	13	7	66.25
Piangil	CAN	44.1	39.4	14	8	65.13
Quambatook	CAN	44.3	41.2	15	8	66.38
Wimmera						
Hamilton	CAN	46.6	37.9	13	7	64.00
Lillimur	CAN	44.1	40.1	12	7	65.50
Murtoa	CAN	45.7	39.4	10	6	64.75
Natimuk	CAN	46.0	39.1	13	7	65.33
Nhill	CAN	44.1	41.3	13	7	66.00
Warracknabeal	CAN	44.5	40.7	13	7	64.88
Victorian weighted average		**45.2**	**40.3**	**13**	**7**	**65.25**
Vic minimum		**42.8**	**37.5**	**9**	**5**	**63.50**
Vic maximum		**46.6**	**43.5**	**21**	**12**	**67.00**

[1] % in whole seed @ 6% moisture, [2] % in oil-free meal @ 10% moisture, [3] µmoles/g in oil-free meal @ 10% moisture,
[4] µmoles/g in whole seed @ 6% moisture, [5] kilograms/ hectolitre.

Table 6. Quality data – Western Australia

Region/zone/site	Grade	Oil	Protein	Glucosinolates		Test weight
		%[1]	%[2]	µmoles/g[3]	µmoles/g[4]	kg/hL[5]
Albany	N/A	48.3	38.3	13	7	67.13
Esperance	N/A	48.8	37.8	13	6	67.13
Geraldton	N/A	46.1	39.8	16	8	66.75
Kwinana	N/A	48.5	37.8	13	7	66.13
WA weighted average		**48.3**	**38.1**	**13**	**7**	**66.78**
WA minimum		**46.1**	**37.8**	**13**	**6**	**66.13**
WA maximum		**48.8**	**39.8**	**16**	**8**	**67.13**

[1] % in whole seed @ 6% moisture, [2] % in oil-free meal @ 10% moisture, [3] µmoles/g in oil-free meal @ 10% moisture,
[4] µmoles/g in whole seed @ 6% moisture, [5] 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]
Northern NSW																			
Dubbo North																			
Gilgandra	0.06	4.2	0.3	0.1	0.1	1.9	63.5	19.2	8.7	0.5	1.0	0.2	<0.1	0.1	0.1	27.9	64.9	7.2	111.7
Dubbo West																			
Nevertire	0.07	4.2	0.3	0.1	0.1	2.0	62.0	20.0	9.4	0.5	0.9	0.2	<0.1	0.1	0.1	29.4	63.5	7.1	113.6
Trangie	0.06	4.1	0.2	<0.1	0.1	1.8	64.6	18.3	8.8	0.5	1.0	0.2	<0.1	0.1	0.1	27.1	66.1	6.8	111.4
Moree North																			
Croppa Creek	0.07	4.1	0.3	0.1	0.2	2.7	64.3	17.0	9.0	0.7	1.0	0.3	<0.1	0.2	0.1	26.0	65.9	8.1	109.4
Moree	0.06	4.0	0.3	0.1	0.2	2.3	63.0	17.5	10.4	0.6	1.0	0.3	<0.1	0.1	0.1	27.8	64.6	7.5	112.8
Narrabri																			
Gunnedah	0.08	4.6	0.3	<0.1	0.1	1.8	60.6	22.1	8.8	0.4	0.8	0.2	<0.1	0.1	0.1	30.8	61.9	7.3	114.2
Werris Creek																			
Premer	0.06	4.2	0.2	<0.1	0.1	1.8	62.2	21.0	8.5	0.5	0.9	0.2	<0.1	0.1	0.1	29.5	63.6	6.9	113.1
Willow Tree	0.06	4.0	0.3	0.1	0.2	2.2	64.7	17.0	9.6	0.5	0.9	0.2	<0.1	0.1	0.1	26.7	66.1	7.2	111.4
Northern NSW weighted average	**0.07**	**4.2**	**0.3**	**0.1**	**0.1**	**2.0**	**62.9**	**19.2**	**9.1**	**0.5**	**0.9**	**0.2**	**<0.1**	**0.1**	**0.1**	**28.3**	**64.4**	**7.3**	**112.4**
Southern NSW																			
Boree Creek																			
Boree Creek	0.06	4.2	0.3	<0.1	0.1	1.7	60.7	20.7	10.4	0.5	1.0	0.2	<0.1	0.1	0.1	31.2	62.2	6.7	116.5
Henty West	0.06	4.0	0.2	<0.1	0.1	1.7	61.2	20.7	10.0	0.5	1.0	0.2	<0.1	0.1	0.1	30.7	62.6	6.7	115.7
Milbrulong	0.06	4.0	0.2	<0.1	0.1	1.7	62.3	19.3	10.3	0.5	1.0	0.2	<0.1	0.1	0.1	29.6	63.7	6.7	115.0
Rand	0.05	3.9	0.2	<0.1	0.1	1.7	61.2	20.8	10.2	0.5	1.0	0.2	<0.1	0.1	0.1	31.0	62.6	6.5	116.3
Cunningar																			
Boorowa	0.05	4.0	0.2	0.1	0.1	1.7	63.3	19.4	9.0	0.5	1.0	0.3	<0.1	0.1	0.1	28.4	64.9	6.8	112.7
Cootamundra	0.05	4.0	0.2	0.1	0.1	1.7	63.0	19.3	9.5	0.5	1.0	0.3	<0.1	0.1	0.1	28.8	64.5	6.7	113.7
Cowra	0.05	3.9	0.2	<0.1	0.1	1.8	64.8	17.7	9.6	0.5	1.0	0.2	<0.1	0.1	0.1	27.3	66.2	6.5	112.5
Cunningar	0.05	4.0	0.3	0.1	0.1	1.8	61.8	19.1	10.8	0.5	1.0	0.2	<0.1	0.1	0.1	29.9	63.3	6.8	115.6
Greenthorpe	0.06	4.0	0.2	<0.1	0.1	1.8	62.9	19.2	9.8	0.5	1.0	0.2	<0.1	0.1	0.1	29.0	64.3	6.7	114.1
Maimuru	0.05	4.1	0.2	0.1	0.1	1.7	62.4	20.0	9.2	0.5	1.0	0.3	<0.1	0.1	0.1	29.3	63.9	6.8	113.7
Griffith																			
Barellan	0.06	4.0	0.3	0.1	0.1	1.9	61.1	20.2	10.4	0.5	1.0	0.2	<0.1	0.1	0.1	30.6	62.5	6.9	115.7
Junee																			
Junee	0.05	4.0	0.2	0.1	0.1	1.6	61.0	20.8	10.2	0.5	1.0	0.2	<0.1	0.1	0.1	31.0	62.4	6.6	116.3
Narrandera	0.06	4.0	0.3	0.1	0.1	2.0	64.0	17.7	9.8	0.5	1.0	0.3	<0.1	0.1	0.1	27.5	65.5	7.0	112.4
Parkes																			
Caragabal	0.06	3.9	0.2	<0.1	0.1	1.7	63.9	18.9	9.3	0.5	1.0	0.2	<0.1	0.1	0.1	28.2	65.4	6.5	113.1
Manildra	0.06	3.9	0.2	0.1	0.1	1.9	62.4	17.6	11.7	0.5	1.0	0.2	<0.1	0.1	0.1	29.4	63.9	6.7	116.0
Parkes Sub	0.06	3.9	0.2	0.1	0.1	1.8	62.0	19.2	10.7	0.5	1.0	0.2	<0.1	0.1	0.1	29.8	63.5	6.7	115.6
Red Bend	0.07	4.2	0.3	<0.1	0.1	1.8	63.2	18.9	9.6	0.5	1.0	0.2	<0.1	0.1	0.1	28.5	64.6	6.9	113.2
Wirrinya	0.06	3.9	0.2	<0.1	0.1	1.7	64.9	17.7	9.3	0.5	1.1	0.2	<0.1	0.1	0.1	27.0	66.4	6.6	112.0
Temora																			
Ardlethan	0.06	4.1	0.3	0.1	0.1	1.9	61.7	19.2	10.5	0.5	1.0	0.2	<0.1	0.1	0.1	29.7	63.2	7.1	114.9
Bribbaree	0.05	3.9	0.2	<0.1	0.1	1.7	63.2	19.5	9.3	0.5	1.1	0.2	<0.1	0.1	0.1	28.9	64.7	6.4	113.7
Milvale	0.05	3.9	0.2	<0.1	0.1	1.7	63.6	18.7	9.6	0.5	1.1	0.3	<0.1	0.1	0.1	28.3	65.1	6.5	113.3
Temora Sub	0.06	4.0	0.2	<0.1	0.1	1.7	63.4	18.5	10.0	0.5	1.1	0.3	<0.1	0.1	0.1	28.5	64.9	6.6	113.7
Wyalong																			
Calleen	0.06	4.0	0.2	<0.1	0.1	1.7	64.0	18.3	9.6	0.5	1.0	0.2	<0.1	0.1	0.1	27.9	65.4	6.6	112.9
Condobolin	0.06	4.2	0.3	<0.1	0.1	1.7	59.4	23.0	9.5	0.5	1.0	0.2	<0.1	0.1	0.1	32.5	60.7	6.8	116.7
Wyalong	0.06	3.9	0.2	<0.1	0.1	1.6	61.4	21.6	9.1	0.5	1.0	0.2	<0.1	0.1	0.1	30.8	62.8	6.5	115.2
Southern NSW weighted average	**0.06**	**4.0**	**0.2**	**0.1**	**0.1**	**1.7**	**62.5**	**19.5**	**9.9**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**29.4**	**63.9**	**6.7**	**114.5**
NSW weighted average	**0.06**	**4.0**	**0.2**	**0.1**	**0.1**	**1.8**	**62.5**	**19.5**	**9.8**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**29.3**	**64.0**	**6.7**	**114.3**
NSW minimum	**0.05**	**3.9**	**0.2**	**<0.1**	**0.1**	**1.6**	**59.4**	**17.0**	**8.5**	**0.4**	**0.8**	**0.2**	**<0.1**	**0.1**	**0.1**	**26.0**	**60.7**	**6.4**	**109.4**
NSW maximum	**0.08**	**4.6**	**0.3**	**0.1**	**0.2**	**2.7**	**64.9**	**23.0**	**11.7**	**0.7**	**1.1**	**0.3**	**<0.1**	**0.2**	**0.1**	**32.5**	**66.4**	**8.1**	**116.7**

[1] Poly – sum of polyunsaturated fatty acids (18:2 & 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, 18:0, 20:0, 22:0 and 24:0), [4] IV – iodine value calculated from fatty acid composition

Table 8. Table 8: Fatty acid composition – South 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	Poly[1]	Mono[2]	Sat[3]	IV[4]
Adelaide																			
Port Adelaide	0.06	4.4	0.3	0.1	0.1	2.0	62.3	19.0	9.8	0.5	0.9	0.2	<0.1	0.1	0.1	28.9	63.8	7.4	113.3
Adelaide weighted average	**0.06**	**4.4**	**0.3**	**0.1**	**0.1**	**2.0**	**62.3**	**19.0**	**9.8**	**0.5**	**0.9**	**0.2**	**<0.1**	**0.1**	**0.1**	**28.9**	**63.8**	**7.4**	**113.3**
Central																			
Bowmans	0.06	4.2	0.3	0.1	0.1	2.0	64.1	17.2	9.9	0.6	1.0	0.3	<0.1	0.1	0.1	27.1	65.6	7.3	111.9
Gladstone	0.06	4.2	0.3	<0.1	0.1	1.9	64.2	17.8	9.5	0.5	1.0	0.2	<0.1	0.1	0.1	27.2	65.7	7.1	111.8
Port Giles	0.06	4.2	0.3	0.1	0.2	2.1	62.3	17.4	11.2	0.6	1.0	0.3	<0.1	0.1	0.1	28.7	63.9	7.5	114.3
Roseworthy	0.06	4.3	0.3	0.1	0.1	1.9	64.5	17.1	9.8	0.5	1.0	0.2	<0.1	0.1	0.1	26.9	65.9	7.1	111.9
Central weighted average	**0.06**	**4.2**	**0.3**	**0.1**	**0.1**	**1.9**	**64.1**	**17.3**	**9.9**	**0.6**	**1.0**	**0.3**	**<0.1**	**0.1**	**0.1**	**27.3**	**65.5**	**7.2**	**112.1**
Eastern																			
Adelaide	0.06	4.3	0.3	0.1	0.1	2.0	62.2	18.2	10.8	0.5	1.0	0.3	<0.1	0.1	0.1	28.9	63.7	7.3	114.3
Bordertown	0.06	4.3	0.3	0.1	0.1	1.8	61.6	19.3	10.6	0.5	1.0	0.2	<0.1	0.1	0.1	29.9	63.0	7.1	115.1
Frances	0.06	4.3	0.3	0.1	0.1	2.1	61.5	18.8	10.8	0.6	0.9	0.2	<0.1	0.1	0.1	29.6	62.9	7.5	114.7
Keith	0.06	4.3	0.3	0.1	0.1	2.0	63.2	18.5	9.6	0.5	0.9	0.2	<0.1	0.1	0.1	28.2	64.6	7.2	112.7
Tailem Bend	0.06	4.2	0.3	0.1	0.1	1.9	62.7	17.7	10.8	0.5	1.0	0.3	<0.1	0.1	0.1	28.5	64.2	7.2	114.0
Wolseley	0.06	4.3	0.3	0.1	0.1	2.0	62.2	18.2	10.8	0.5	1.0	0.3	<0.1	0.1	0.1	28.9	63.7	7.3	114.3
Western Victoria																			
Dooen	0.06	4.2	0.3	0.1	0.1	1.8	61.4	19.5	10.6	0.5	1.0	0.3	<0.1	0.1	0.1	30.1	62.9	7.0	115.4
Eastern weighted average	**0.06**	**4.3**	**0.3**	**0.1**	**0.1**	**1.9**	**62.4**	**18.6**	**10.2**	**0.5**	**0.9**	**0.2**	**<0.1**	**0.1**	**0.1**	**28.9**	**63.9**	**7.2**	**113.8**
Western																			
Cummins	0.06	4.2	0.3	0.1	0.1	2.0	63.0	17.4	10.9	0.5	1.0	0.3	<0.1	0.1	0.1	28.3	64.5	7.2	113.9
Port Lincoln	0.06	4.3	0.3	0.1	0.1	2.0	62.4	18.0	10.8	0.5	0.9	0.3	<0.1	0.1	0.1	28.8	63.9	7.3	114.3
Rudall	0.07	4.6	0.3	0.1	0.1	1.8	59.1	22.3	9.7	0.5	0.9	0.2	<0.1	0.1	0.1	32.0	60.6	7.4	115.9
Tumby Bay	0.07	4.5	0.3	0.1	0.1	1.8	60.2	20.8	10.4	0.5	0.9	0.2	<0.1	0.1	0.1	31.2	61.6	7.2	116.1
Western weighted average	**0.06**	**4.3**	**0.3**	**0.1**	**0.1**	**1.9**	**62.2**	**18.4**	**10.7**	**0.5**	**1.0**	**0.3**	**<0.1**	**0.1**	**0.1**	**29.1**	**63.7**	**7.2**	**114.4**
SA weighted average	**0.06**	**4.3**	**0.3**	**0.1**	**0.1**	**1.9**	**62.9**	**18.2**	**10.3**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**28.4**	**64.4**	**7.2**	**113.4**
SA minimum	**0.06**	**4.2**	**0.3**	**<0.1**	**0.1**	**1.8**	**59.1**	**17.1**	**9.5**	**0.5**	**0.9**	**0.2**	**<0.1**	**0.1**	**0.1**	**26.9**	**60.6**	**7.0**	**111.8**
SA maximum	**0.07**	**4.6**	**0.3**	**0.1**	**0.2**	**2.1**	**64.5**	**22.3**	**11.2**	**0.6**	**1.0**	**0.3**	**<0.1**	**0.1**	**0.1**	**32.0**	**65.9**	**7.5**	**116.1**

[1] Poly – sum of polyunsaturated fatty acids (18:2 & 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, 18:0, 20:0, 22:0 and 24:0), [4] IV – iodine value calculated from fatty acid composition

Table 9. Fatty acid composition – Victoria

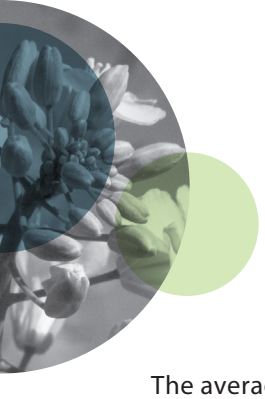
Region/zone/site	14:0	16:0	16:1	17:0	17:1	18:0	18:1	18:2	18:3	20:0	20:1	22:0	22:1	24:0	24:1	Poly[1]	Mono[2]	Sat[3]	IV[4]
Central Victoria																			
Berrybank	0.06	4.3	0.2	0.1	0.1	1.9	62.3	20.4	8.8	0.5	1.0	0.3	<0.1	0.1	0.1	29.2	63.7	7.1	113.0
Dunolly	0.06	4.2	0.2	<0.1	0.1	1.7	61.1	21.0	9.5	0.5	1.0	0.2	<0.1	0.1	0.1	30.5	62.5	6.9	114.9
Elmore	0.05	4.1	0.2	<0.1	0.1	1.7	61.0	21.3	9.6	0.5	0.9	0.2	<0.1	0.1	0.1	30.9	62.3	6.7	115.5
Mitiamo	0.06	4.2	0.2	<0.1	0.1	1.7	62.2	20.0	9.6	0.5	0.9	0.2	<0.1	0.1	0.1	29.6	63.5	6.8	114.3
Murchison East	0.06	4.2	0.3	<0.1	0.1	1.7	61.1	20.9	9.8	0.5	0.9	0.2	<0.1	0.1	0.1	30.8	62.4	6.8	115.5
Westmere	0.05	4.3	0.2	<0.1	0.1	1.8	63.1	19.9	8.6	0.5	1.0	0.3	<0.1	0.1	0.1	28.5	64.5	7.1	112.2
North East																			
Barnes Crossing	0.06	4.2	0.2	0.1	0.1	1.8	62.1	20.7	8.9	0.5	0.9	0.2	<0.1	0.1	0.1	29.6	63.5	6.9	113.6
Deniliquin	0.05	4.1	0.2	<0.1	0.1	1.8	62.4	20.3	9.3	0.5	1.0	0.2	<0.1	0.1	0.1	29.5	63.7	6.8	113.9
Dookie	0.06	4.0	0.2	0.1	0.1	1.8	63.0	19.0	9.8	0.5	1.0	0.3	<0.1	0.1	0.1	28.8	64.5	6.7	113.8
Oaklands (CAN)	0.06	4.0	0.2	<0.1	0.1	1.7	61.9	20.1	9.9	0.5	1.0	0.2	<0.1	0.1	0.1	30.0	63.3	6.7	115.1
Oaklands (CANG)	0.07	4.4	0.3	<0.1	0.1	1.9	62.1	18.7	10.4	0.5	1.0	0.2	<0.1	0.1	0.1	29.2	63.6	7.3	114.3
Tocumwal	0.06	4.0	0.2	<0.1	0.1	1.8	62.2	20.1	9.6	0.5	1.0	0.2	<0.1	0.1	0.1	29.7	63.6	6.7	114.5
Yarrawonga	0.05	3.9	0.2	0.1	0.1	1.8	63.7	18.2	9.9	0.5	1.0	0.3	<0.1	0.1	0.1	28.2	65.2	6.7	113.4
Northern Mallee																			
Ouyen	0.06	4.3	0.3	0.1	0.2	2.1	62.7	18.6	9.8	0.4	0.8	0.2	0.2	0.1	0.1	28.5	64.3	7.3	112.9
Southern Mallee																			
Bealah	0.06	4.3	0.3	0.1	0.1	1.9	61.4	20.8	9.3	0.5	0.9	0.2	<0.1	0.1	0.1	30.1	62.8	7.1	114.1
Donald	0.06	4.1	0.3	0.1	0.1	1.9	61.5	19.6	10.5	0.5	1.0	0.2	<0.1	0.1	0.1	30.0	62.9	7.0	115.3
Rainbow	0.06	4.1	0.3	0.1	0.2	2.2	65.1	17.1	8.9	0.5	1.0	0.2	<0.1	0.1	0.1	26.0	66.7	7.3	110.2
Swan Hill																			
Boort	0.06	4.1	0.2	0.1	0.1	1.9	63.9	18.4	9.5	0.5	1.0	0.2	<0.1	0.1	0.1	27.8	65.3	6.8	112.6
Piangil	0.06	4.0	0.3	0.1	0.1	2.0	62.7	18.5	10.2	0.5	1.0	0.2	0.1	0.1	0.1	28.7	64.2	7.1	113.7
Quambatook	0.06	4.2	0.3	0.1	0.1	1.9	62.8	19.4	9.4	0.5	0.9	0.2	<0.1	0.1	0.1	28.8	64.2	7.0	113.3
Wimmera																			
Hamilton	0.05	4.2	0.3	0.1	0.1	1.8	62.5	18.9	10.1	0.6	1.0	0.3	<0.1	0.1	0.1	28.9	64.1	7.0	113.9
Lillimur	0.06	4.2	0.3	0.1	0.1	2.0	62.4	18.2	10.7	0.6	1.0	0.2	<0.1	0.1	0.1	28.8	63.9	7.3	114.2
Murtoa	0.06	4.2	0.3	0.1	0.1	1.8	63.4	18.2	10.0	0.5	1.0	0.3	<0.1	0.1	0.1	28.2	64.9	7.0	113.2
Natimuk	0.06	4.1	0.3	0.1	0.1	1.8	63.0	18.6	10.1	0.5	1.0	0.2	<0.1	0.1	0.1	28.7	64.4	6.9	113.9
Nhill	0.06	4.2	0.3	0.1	0.1	1.9	61.5	19.7	10.4	0.5	0.9	0.2	<0.1	0.1	0.1	30.1	62.9	7.0	115.3
Warracknabeal	0.06	4.0	0.3	0.1	0.1	2.0	63.8	18.1	9.7	0.5	1.0	0.2	<0.1	0.1	0.1	27.8	65.2	7.0	112.6
Vic. weighted average	**0.06**	**4.1**	**0.3**	**0.1**	**0.1**	**1.8**	**62.5**	**19.5**	**9.7**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**29.2**	**63.9**	**6.9**	**113.9**
Vic. minimum	**0.05**	**3.9**	**0.2**	**<0.1**	**0.1**	**1.7**	**61.0**	**17.1**	**8.6**	**0.4**	**0.8**	**0.2**	**<0.1**	**0.1**	**0.1**	**26.0**	**62.3**	**6.7**	**110.2**
Vic. maximum	**0.07**	**4.4**	**0.3**	**0.1**	**0.2**	**2.2**	**65.1**	**21.3**	**10.7**	**0.6**	**1.0**	**0.3**	**0.2**	**0.1**	**0.1**	**30.9**	**66.7**	**7.3**	**115.5**

[1] Poly – sum of polyunsaturated fatty acids (18:2 & 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, 18:0, 20:0, 22:0 and 24:0), [4] IV – iodine value calculated from fatty acid composition

Table 10. Fatty acid composition – Western Australia

Port Zone	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]
Albany	0.05	4.1	0.2	<0.1	0.1	1.6	60.5	20.7	10.7	0.5	1.0	0.2	<0.1	0.1	0.1	31.4	61.9	6.7	117.0
Esperance	0.05	4.1	0.2	<0.1	0.1	1.6	59.4	21.5	11.0	0.5	1.0	0.2	<0.1	0.1	0.1	32.5	60.8	6.7	118.2
Geraldton	0.05	4.2	0.2	<0.1	0.1	1.7	59.8	22.2	9.8	0.5	1.0	0.2	<0.1	0.1	0.1	32.1	61.2	6.7	116.7
Kwinana	0.05	4.1	0.2	<0.1	0.1	1.7	60.3	21.4	10.3	0.5	1.0	0.2	<0.1	0.1	0.1	31.7	61.6	6.7	116.8
WA weighted average	**0.05**	**4.1**	**0.2**	**<0.1**	**0.1**	**1.7**	**60.0**	**21.3**	**10.6**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**31.9**	**61.4**	**6.7**	**117.3**
WA minimum	**0.05**	**4.1**	**0.2**	**<0.1**	**0.1**	**1.6**	**59.4**	**20.7**	**9.8**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**31.4**	**60.8**	**6.7**	**116.7**
WA maximum	**0.05**	**4.2**	**0.2**	**<0.1**	**0.1**	**1.7**	**60.5**	**22.2**	**11.0**	**0.5**	**1.0**	**0.2**	**<0.1**	**0.1**	**0.1**	**32.5**	**61.9**	**6.7**	**118.2**

[1] Poly – sum of polyunsaturated fatty acids (18:2 & 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, 18:0, 20:0, 22:0 and 24:0), [4] IV – iodine value calculated from fatty acid composition



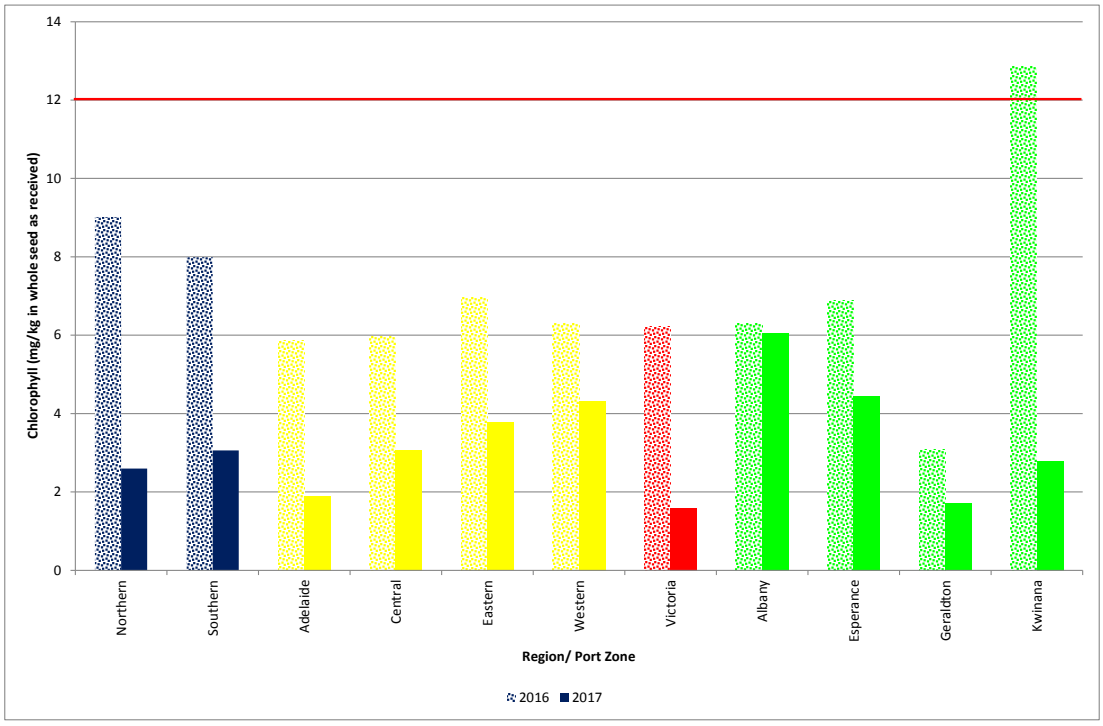
Chlorophyll

The average chlorophyll content for the Australian harvest in 2017 was 4 mg/kg (4 ppm) in whole seed as received. This is a 50% decrease in chlorophyll content from the 2016 harvest.

Table 11. Chlorophyll by region/ port zone

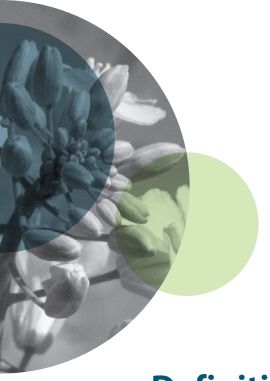
State	Region/port zone	Chlorophyll (mg/kg)[1]
NSW	Northern	3
NSW	Southern	3
SA	Adelaide	2
SA	Central	3
SA	Eastern	4
SA	Western	4
Vic	Victoria	2
WA	Albany	6
WA	Esperance	4
WA	Geraldton	2
WA	Kwinana	3
Australian weighted average		**4**

[1] mg/kg in whole seed as received.



Red line indicates the AOF limit of 12 mg/kg in whole seed
Blue = NSW regions, Yellow = SA regions, Red = Victoria, Green = WA port zones, see figures 26–30.

Figure 31. Average chlorophyll content by region/ port zone 2016–2017



Definitions, methods and references

Definitions

Canola

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 (AOF 2015, page 27).

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

The ***AOF Quality Standards, Technical Information & Typical Analysis (2017)*** Standard Reference for canola is CSO 1, Standard Reference for non-GM canola is CSO 1-a.

GM canola

The genetically modified (GM) canola referred to in this publication are lines approved for commercial release in Australia by the Office of the Gene Technology Regulator (OGTR).

GM canola is traded under the grade 'CANG' by GrainCorp Operations Limited. GM canola is approved for commercial release in South Australia.

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 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 four hours. The sample is reground and extracted for two hours. The sample is again ground and extracted for a further two 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 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 × 6.25) in oil-free meal at 10% moisture.

Glucosinolate content

Total glucosinolate content 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 in oil-free meal at 10% moisture and µmoles glucosinolates/ gram in 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. 33 2015: '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.'

Test weight

Test weight is a volumetric grain weight measured using a Franklin chrondrometer and reported as kilograms/hectolitre.

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 absorbance of the solution 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 & Typical Analysis 2018/19* Issue 17, 1 August 2018.