



THE GRAINS INDUSTRY'S VALUE IN REGIONAL ECONOMIES



GRDC[™]
GRAINS RESEARCH
& DEVELOPMENT
CORPORATION

FEBRUARY 2020



**REGIONAL
AUSTRALIA
INSTITUTE**

grdc.com.au

ABOUT THE REGIONAL AUSTRALIA INSTITUTE

Independent and informed by both research and ongoing dialogue with the community, the Regional Australia Institute (RAI) develops policy and advocates for change to build a stronger economy and better quality of life in regional Australia – for the benefit of all Australians. The RAI was established with support from the Australian Government.

DISCLAIMER AND COPYRIGHT

This research report translates and analyses findings of research to enable an informed public discussion of regional issues in Australia. It is intended to assist people to think about their perspectives, assumptions and understanding of regional issues. No responsibility is accepted by RAI Limited, its Board or its funders for the accuracy of the advice provided or for the quality of advice or decisions made by others based on the information presented in this publication.

Unless otherwise specified, the contents of this report remain the property of the Regional Australia Institute. Reproduction for non-commercial purposes with attribution of authorship is permitted.

ACKNOWLEDGEMENTS

The Regional Australia Institute gratefully acknowledges funding from the Grain Research Development Corporation for this research and the contribution made by officials from the Grains Research and Development Corporation. Our appreciation also extends to the regional community members and interviewees from the Goondiwindi, Beverley and Indigo Shires, who participated in this research.

REFERENCE

This paper can be referenced as:

Achurch H., Houghton K. and Beaton R., (2020). *The Grains Industry's Value in Regional Economies: Final Report*. Canberra, The Regional Australia Institute.

CONTACTS AND FURTHER INFORMATION

Hayley Achurch

Lead Researcher

P. 02 6260 3733

E. info@regionalaustralia.org.au

Further information can be found at www.regionalaustralia.org.au

COVER IMAGE

Flowering canola in the Western Australian wheatbelt. Image credit: Hayley Achurch, 2019 ©

EXECUTIVE SUMMARY

Agriculture is a significant industry in regional Australia. Grains makes up roughly a quarter of Australia's agriculture value and is a key commodity for regional communities across all 6 of Australia's states.

The value created by the grains industry is more than the headline production value figures. Grains contribution and importance differs across regional economies, including the value and jobs it provides directly but also positive socio-economic impacts in other parts of the region's economy.

This research looks at the impact of the grains industry in regional economies across the country to examine the grain industry's importance in regional economies. This contributes to an evidence base that can inform GRDC, industry, government and community decisions about the industry.

The value of grains in communities looks different in different regions and this research points out some of the reasons for this. The research used quantitative and qualitative research to unpack how the grains industry's value differs across different types of regions. This included benchmarking each regional council areas to show the grain industries relative value to different council areas across regional Australia.

This measure of 'value' included total grains employment and the proportion of grain jobs in the local economy, as well as measures of gross value and tonnage. The top 20 per cent were categorised as where grains value is Most Important. This ranged through to regions categorised in the bottom 20 per cent category, Least Important, where grains is a less significant value in terms of employment, gross value and tonnage, for the community.

The research draws on in depth case studies in three grain growing locations in the Northern, Southern and Western Growing Regions. Case study research was conducted in the council regions of Goondiwindi in Queensland, Indigo in Victoria and Beverley in Western Australia. Local leaders and people in grain growing supply chains were interviewed in each region to better understand the impact of the grain industry to the local community, particularly in terms of employment and flow on business activity.

This research indicates that in some regions, the local grains workforce is tight meaning that employers are facing difficulties the sourcing labour and skills they need to maintain their business. This is a widespread issue which can limit the potential growth of the industry sector.

Some regions have labour and skills gaps in particular occupations which are also used in the mining industry which potentially indicates competition for labour between the two industries. The degree which this occurs varies greatly between regions.

The grain workforce has a degree of elasticity between different seasons, with workforces growing and shrinking in the wet and dry years. The growth and contraction of jobs is particularly seen in casual, contract and overseas workers rather than full time and part time workers. This is partially

because employers aim to keep full time employees during dry seasons because the tight labour markets makes it difficult to fill those positions again in the good seasons.

Quantitative comparisons of employment levels with financial value and tonnage, revealed three points about local grain industry operation in different regions. Firstly, this research shows that across regions the number of grain production jobs increases as the raw tonnage and gross value increase. For example, Moree Plains has both a high number of production jobs (737 jobs in 2016) and tonnage and gross value (1,745,000 tonnes and \$793 million in 2015-16).

Secondly, there are distinct grain production regions and distinct grain processing regions. Grain production regions have a stronger focus on the growing of grains while processing is the value add aspect of the industry, which includes milling, stockfeed and cereal manufacturing. Employment in grain processing has geographically centralised over time instead, like in the past, of being located in the regions where the grains are grown. This means that the largest number of grain processing jobs are now in regions with low or no grain production. For example, Wodonga had 267 grain processing jobs in 2016 but produced just 170 tonnes and \$0.06 million of gross value.

Thirdly, from an employment perspective, grains production jobs are generally most important in small regional economies, where there are limited other industries providing employment. This means that in some regions where grain jobs are most important for the local employment, there can be relatively low grains tonnage and gross value produced in the area. For example, Trayning had a high specialisation in grain production jobs in 2016 (47 times the national average) but a low tonnage and gross value in 2015-16 (36,000 tonnes and \$10 million). For regional economies, the proportion of local jobs that grains contributes is important, not just the raw total number of jobs. This requires different consideration than the overall industry productivity view.

This research shows that for every 100,000 tonnes of grain produced, there is on average 87 grain production jobs in the Northern Growing Region, 121 in the Southern Growing Region and 54 in the Western Growing Region. When viewed by gross value, every \$10 million there is on average 22 grain production jobs in the Northern Growing Region, 41 in the Southern Growing Region and 17 in the Western Growing Region.

In regions which have maintained their grains specialisations over time, grains are likely to continue to be a valuable source of employment in the future. The number of jobs however may fluctuate with changes in technology and other practices which improve production efficiencies.

CONTENTS

Executive Summary	3
Employment in the Grains Industry	6
Grains Volume and Gross Value	11
Benchmarking the Grains Industry’s Importance in Regional Economies	13
Case Studies.....	16
The Value of Grains to Goondiwindi.....	17
The Value of Grains to Indigo	26
The Value of Grains to Beverley	33
Scenarios.....	40
Conclusion	47
Appendix A – Methods.....	50
Attachment B – Benchmarking Grains Importance in Regional Economies.....	51
Notes and References	63

EMPLOYMENT IN THE GRAINS INDUSTRY

In 2016, there were 34,745 grain production jobs across Australia. This count is direct employment in the growing of grain, cotton and rice, as well as integrated grain-sheep and grain-cattle production. The bulk of these jobs are in New South Wales (29 per cent) and Western Australia (23 per cent), followed by South Australia, Victoria and Queensland (17 per cent, 17 per cent and 13 per cent respectively) (Figure 1). These figures do not include the number of farm managers, where their occupation may be ‘manager’ rather than a form of grain producer.

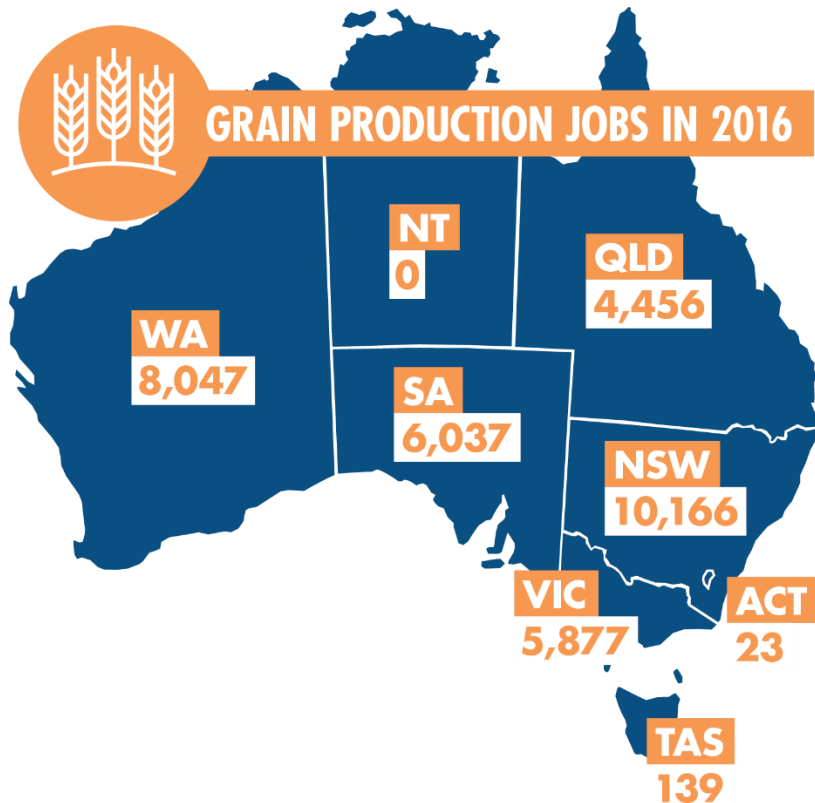


Figure 1: The number of direct grain production jobs by state. Raw data source: ABS Census, 2016.

At the regional level, the Local Government Areas (LGAs) with the highest number of grain production jobs were Toowoomba, Western Downs, Moree Plains, Yorke Peninsula and Esperance (Table 1). For each of these regions, grain growing (excluding cotton and rice) was the highest employing occupation followed by integrated grain-sheep or grain-cattle production, and then cotton growing for Toowoomba, Western Downs and Moree Plains.

Table 1: The top 5 Local Government Areas by number of grain production jobs, 2016.

Rank	LGA	Growing Region and Sub Region	Number of grain production jobs
1	Toowoomba	Northern, South East QLD	1,111
2	Western Downs	Northern, South East and South West QLD	887
3	Moree Plains	Northern, North West NSW	737
4	Yorke Peninsula	Southern, Lower EP, Yorke and Mid North	667
5	Esperance	Western, Esperance	556

Over time, grain production jobs have undergone significant declines across Australia. In 2006, there were 15,962 more grain production jobs than in 2016 (in 2006 there was 50,707 grain production jobs in total). The greatest decreases over this time period were in New South Wales, which fell by 6,492 jobs and its share of grain production jobs nationally fell by 19 per cent. Over a 10 year period (2006-2016), no regional LGAs increased the raw number of grain production jobs. This reflects the national picture where grain production jobs are decreasing. At the regional scale, the most significant grain production job decreases were also in the New South Wales, in the LGAs of Lachlan and Moree Plains (-392 jobs and -369 jobs respectively from 2006 to 2016).

Job declines in grain production have occurred alongside job declines in the broader agricultural production industry. A contributing factor to this is the improvements in technology and other efficiencies which mean that the economic value of production continues to increase but that there is a reduced need for human labour.

GRAINS SPECIALISATIONS IN REGIONAL AUSTRALIA

While the raw number of grain production jobs is important, what is more important for regional economies is understanding what proportion of local jobs are in grain production compared to other industries. Regions which have a high proportion of grain production jobs, compared to the national average, have a specialisation in grain production. By identifying the specialised grain production regions, we can see where grain production jobs are a more important source of employment for the local economy than in other regions. Regions with a high specialisation are more dependent on the success of the grains industry for economic outcomes.

Figure 2 shows where the specialised grain production regions are across Australia. This shows a particularly strong geographic concentration across the Western Australian wheatbelt and southern region, around the Yorke and Eyre Peninsulas, surrounding the Grampians region, through central and into inland south west Western Australia. The strength of a region's specialisation is determined using a Location Quotient Analysis (see the Methods section of this report in Appendix A), where the higher the score the more specialised the region is compared to the national average (indicated in darker red hues).

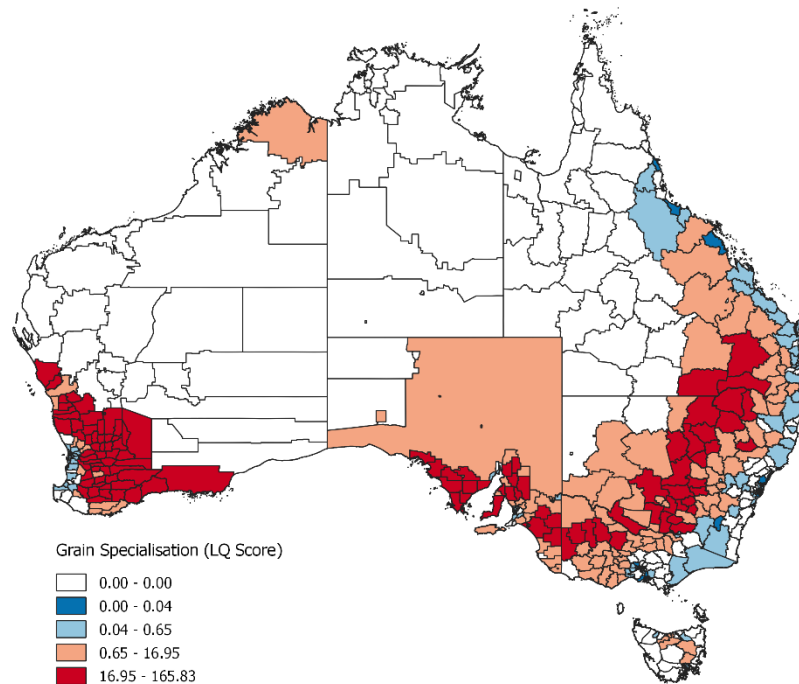


Figure 2: The level of grains production specialisation for each Local Government Area. Darker red hues indicate a strong level of specialisation, above the national average, whereas blue hues show a lower specialisation. The key indicates the strength of specialisation using Location Quotient scores, 2016.

Of these, the Local Government Areas with the greatest specialisation in grain production are all in the Western Growing Region. The top 5 regions are Kent, Mount Marshall, Kulin, Dumbleyung and Narembeen (Table 2). This is where grain production accounts for the highest proportion of local jobs and is most important to the local economy.

The specialisation analysis also indicated that grain production is an important employer for the Shire of Wyndham-East Kimberley in northern Western Australia. This is a region which is outside the typical grains Growing Regions of Northern, Southern and Western. In 2016, Wyndham-East Kimberley had 28 other grain growing jobs. This is a small raw number of jobs however in a total workforce of 3,074 jobs, the grains industry is an important source of local employment where there are limited other employment options.

Table 2: The top 5 Local Government Areas by specialisation in grain production, 2016.

Rank	LGA	Growing Region and Sub Region	Specialisation Score
1	Kent	Western, Albany	165.83
2	Mount Marshall	Western, Kwinana East	156.95
3	Kulin	Western, Albany	142.50
4	Dumbleyung	Western, Albany	131.94
5	Narembeen	Western, Albany and Kwinana East	125.16

The regions in Table 2 have been among the most specialised grain production regions overtime with each also specialising in 2006, 2011 and 2016. This means the grains industry will likely continue to be a valuable source of employment for these communities into the future.

There are a large number of regional economies which are becoming more specialised in grain production (211 LGAs out of 264 LGAs). Grain production is becoming increasingly important for local employment and may indicate a narrowing of the employment base.

EMPLOYMENT IN THE VALUE ADD COMPONENT OF THE GRAINS INDUSTRY

Alongside grain production, the raw growing of grain crops, there are often other associated business activities which provide further employment as a result of grains. This includes occupations such as grain milling, cereal, pasta and baking mix manufacturing, prepared animal and bird feed manufacturing, oil and fat manufacturing, cereal grain wholesaling and grain storage services. Some of the regions where employment in these occupations is greatest are listed in Table 3.

The grains industry also stimulates other employment at the local level including in the transportation and packaging services industries. Some of the regional areas where employment in these types of occupations is most significant are listed below, however the data is not available to the scale which allows grains transportation and packaging activities to be separated from transportation and packing that supports other industries. The regions where employment in these occupations is greatest are also listed in Table 3.

Table 3: Top regions for the highest number of other grain related jobs, and non-grain specific transport and packaging jobs, 2016.

4-Digit ANZSIC Occupation	Region with the largest number of jobs		Region with the greatest proportion of jobs	
	LGA	Jobs (no.)	LGA	Jobs (%)
Grain milling	Leeton	274	Leeton	15%
	Shoalhaven	173	Narrandera	6%
	Cabonne	117	Cabonne	5%
	Edward River	63	Edward River	5%
	Orange	58	Shoalhaven	2%
Cereal, pasta and baking mix	Central Coast	423	Federation	4%
	Lake Macquarie	243	Indigo	4%
	Indigo	85	Tatiara	3%
	Federation	80	Wagin	2%
	Tatiara	45	Central Coast	2%

Prepared animal and bird feed manufacturing	Wodonga	240	Wodonga	6%
	Albury	209	Bathurst	5%
	Bathurst	199	Albury	4%
	Toowoomba	147	Wagin	4%
	Western Plains	90	Federation	3%
Oil and fat manufacturing	Wagga Wagga	31	Narrabri	1%
	Lake Macquarie	30	Kojonup	1%
	Narrabri	30	Cabonne	1%
	Greeter Geelong	26	Gundagai	1%
	Newcastle	22	Carrathool	1%
Cereal grain wholesaling	Copper Coast	49	Ceduna	5%
	Port Lincoln	47	Copper Coast	4%
	Toowoomba	46	Tumby Bay	3%
	Yorke Peninsula	31	Port Lincoln	3%
	Charles Stuart	28	Gnowangerup	2%
	Rockingham	28		
Grain storage services	Esperance	70	Koorda	13%
	Albany	63	Merredin	9%
	Toowoomba	58	Wyalkatchem	8%
	Greater Geelong	57	Corrigin	5%
	Greater Geraldton	51	Mingenew	6%
Transport (includes non-grain transportation)	Brisbane	5,166	Port Augusta	21%
	Logan	3,706	Merredin	19%
	Moreton Bay	3,047	Wyndham	17%
	Wyndham	3,032	Melton	16%
	Blacktown	2,815	Port Hedland	15%
<i>Transport - Regional Only</i>	<i>Gold Coast</i>	<i>2,501</i>	<i>Port Augusta</i>	<i>21%</i>
	<i>Ipswich</i>	<i>2,182</i>	<i>Merredin</i>	<i>19%</i>
	<i>Mackay</i>	<i>1,579</i>	<i>Port Headland</i>	<i>15%</i>
	<i>Townsville</i>	<i>1,571</i>	<i>Rockhampton</i>	<i>15%</i>
	<i>Toowoomba</i>	<i>1,468</i>	<i>Mallala</i>	<i>14%</i>
Packaging (includes non-grain packaging)	Brisbane	257	Renmark Paringa	10%
	Mildura	240	Barossa	5%
	Fairfield	225	Loxton Waikerie	5%
	Casey	220	North Burnett	5%
	Barossa	217	Mildura	4%

GRAINS VOLUME AND GROSS VALUE

Alongside employment, grain production also brings financial value to regional economies. The regions with the greatest volume of grain production in 2015-16 were Esperance (1.78 million tonnes), Moree Plains (1.75 million tonnes), Western Downs (0.97 million tonnes) and Carrathool (0.82 million). Figure 3 shows where grain volumes were highest in 2015-16 at the LGA level. This map shows the strong geographic concentration along the Northern, Southern and Western Growing Regions.

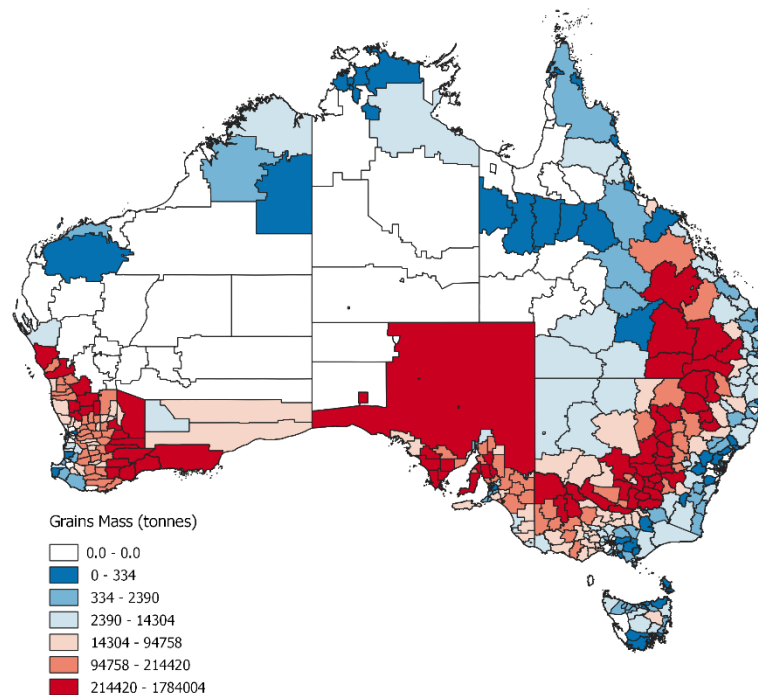


Figure 3: The volume of grain production in Local Government Areas. Where deeper reds indicate higher volumes and blues indicate lower volumes by tonne. This analysis uses raw data from ABS Agricultural Census, 2015-16.

The highest value in 2015-16 was in Moree Plains with \$793.4 million. Followed by Esperance (\$571.2 million), Western Downs (\$438.6 million), Carrathool (\$370.4 million) and Toowoomba (\$338.6 million). Figure 4 shows the geographic distribution of this across the LGAs which is roughly similar to the distribution of grain volume.

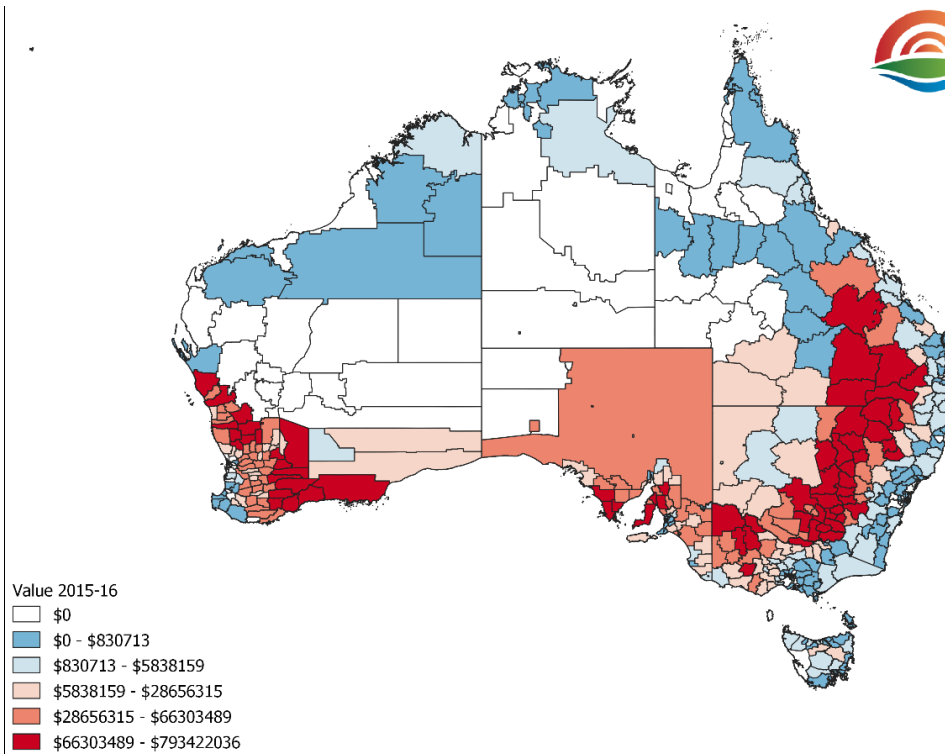


Figure 4: The gross value of grain production in Local Government Areas. Where deeper red indicates higher gross values and blues indicate lower values. This analysis uses raw data from ABS Agricultural Census, 2015-16.

Seasonal conditions contribute to volume and gross value variations each year. This data is a snapshot from 2015-16 which produced fairly expected volumes. This contrasts against the following year which saw significant increases in grain volumes for all states, then a return back to more expected volumes in 2017-18 (Figure 5).

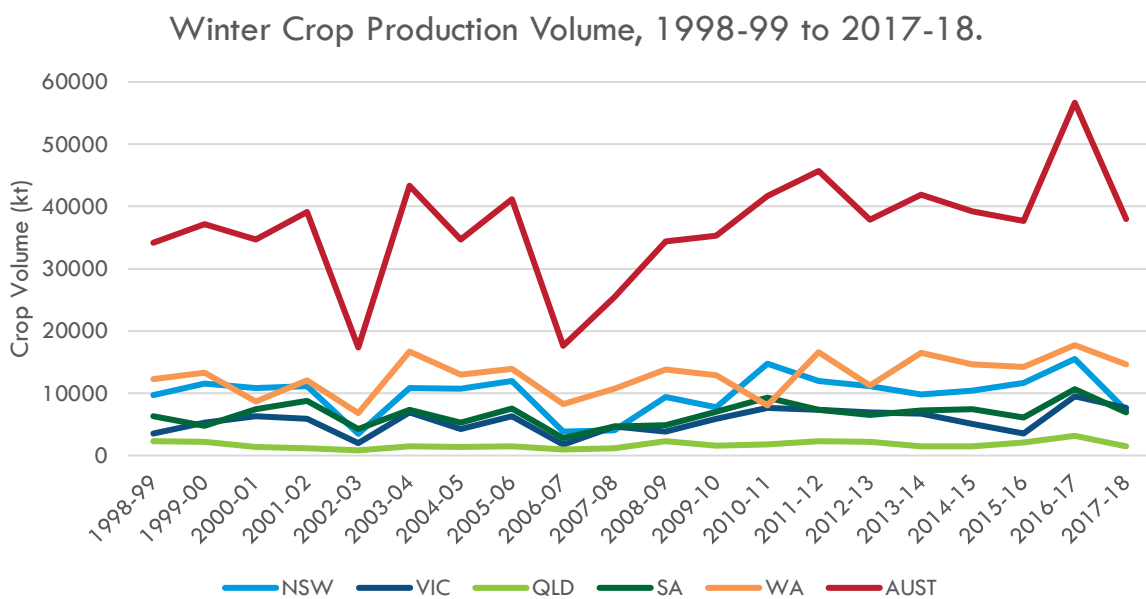


Figure 5: Variation in winter crop volume by financial year using data from ABARES' Australian Crop Report, December 2018

BENCHMARKING THE GRAINS INDUSTRY'S IMPORTANCE IN REGIONAL ECONOMIES

The grains industry provides employment and financial value to a number of regional economies across Australia. The industry is of more importance in some regional economies than others. Using a range of employment and value indicators (Table 3), each regional LGA with grain production employment in 2016 has been benchmarked according to the importance of the grains industry in the local economy (see Methods at Appendix A). This shows both where the grains industry is of greatest importance and the scale of this importance. The benchmarking also shows where grains is of less importance and the scale of this shows what would be needed for grains to have a greater importance in the local economy. Results are displayed in full at Appendix B.

Table 4: Grains Indicator Quintile Ranges, used to determine where grains is a more significant contributor to regional economies.

Indicator	Grains Production Employment Share (%)	Grains Production Jobs LQ	Grains Production Change in Specialisation LQ	Other Grains Related Jobs LQ	Grains Value (\$million)	Grains Mass (tonnes)
Top Quintile	18.86% - 54.85%	57.02 – 165.83	+8.58 – +57.60	3.10– 27.11	\$77 - \$793	235,618 – 1,784,003
Second Quintile	6.21% - 18.86%	18.76 – 57.02	+2.30 – +8.58	1.61 – 3.10	\$41 - \$77	125,219 – 235,618
Third Quintile	1.37% - 6.21%	4.14 – 18.76	+0.40 – +2.30	0.44 – 1.61	\$16 - \$41	53,643 – 125,219
Fourth Quintile	0.23% - 1.37%	0.71 – 4.14	+0.01 – +0.40	0.00 – 0.44	\$2 - \$16	5,858 – 53,643
Fifth Quintile	0% - 0.23%	0.01 – 0.71	-32.63 – +0.01	0.00 – 0.00	\$0 - \$2	0 – 5,858

Regions which are in the top quintile, are those which are in the top 20 per cent for that measure. The second quintile is the 20-40 per cent bracket, and each bracket continues down sequentially until the bottom 20 per cent in the fifth quintile. As Table 4 shows, regions where grains employment is the most significant contributor to regional economies are LGAs where grain production accounts for more than 18.86 per cent of local employment and/or there is a specialisation score of over 57.02. By volume and gross value, LGAs which produced over \$77 million or 235,618 tonnes were where grains was a more significant contributor to the economy.

Carrathool, Buloke, Gnowangerup, Jerramungup, Lake Grace, Wongan-Ballidu and Yarriambiack are examples of a regions where the grains industry is classified as most important. These LGAs rank in the top quintile for all of the employment, volume and gross value measures. The benchmarked categories for each LGA are shown in Figure 6 and more detailed information is at Attachment B.

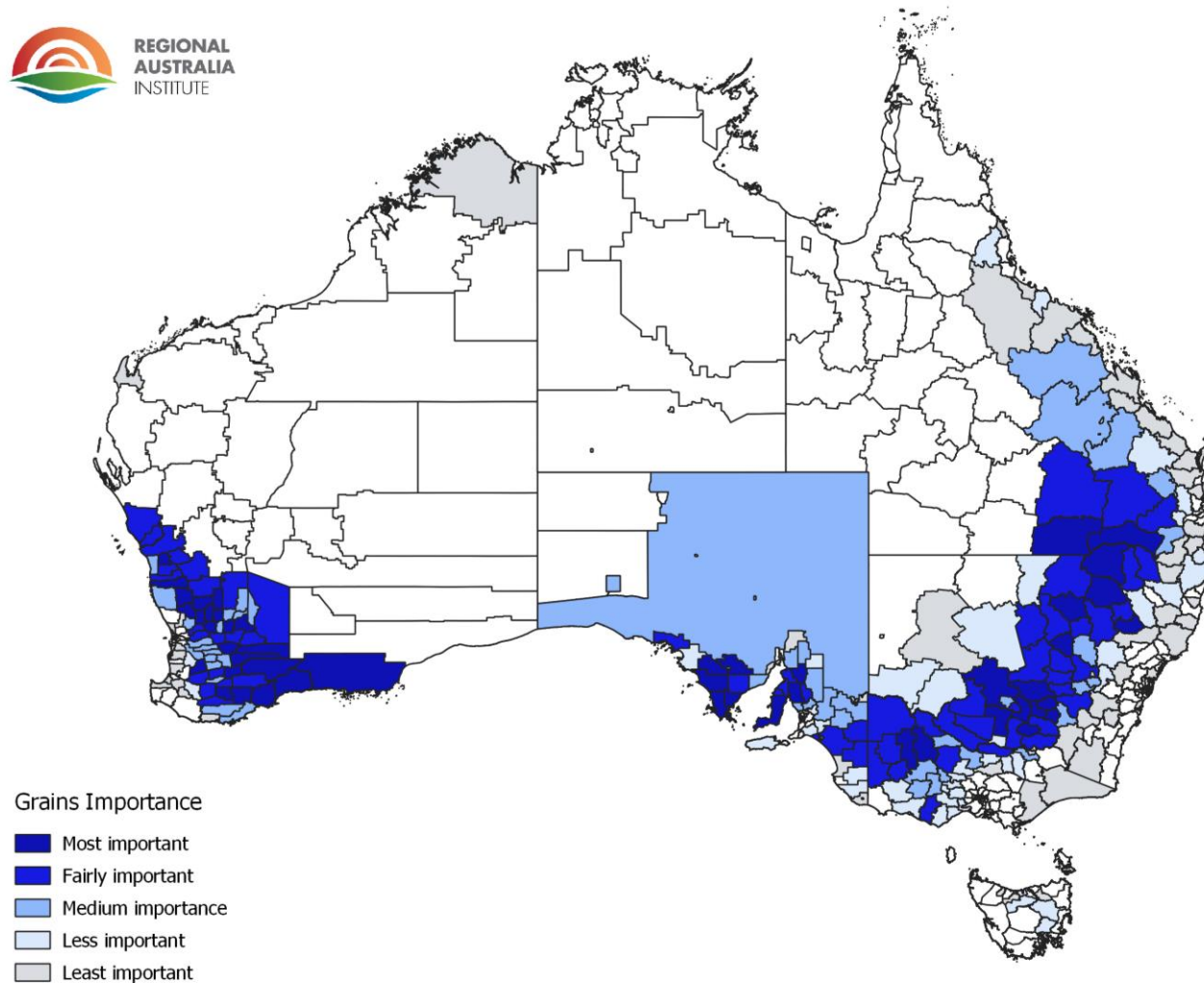


Figure 6: Benchmarking of grains importance to Local Government Areas, where deeper blue hues are regions where the grains industry is of greater importance according to grain production employment, other grain related employment, Location Quotient scores, gross value and tonnage.

There are also some regions where the grains industry is classified as less important or least important. This includes Wagga Wagga and Albury, where there is a high volume and gross value generated by the industry but where its significance for employment is less. This is because the local economy is more diverse and there are many other industries which generate economic and employment activity beyond the grains industry.

In regions where agriculture accounts for a high proportion of employment, agriculture also tends to contribute a disproportionate share of total output. A region with a strong agricultural industry base is likely to have both high shares of employment and gross value in relation to the wider regional economy.

The benchmarking is important to guide the selection of three case study locations where the impact of grains production and post production on the local economy can be further explored. Goondiwindi, Indigo and Beverley council areas were selected as the case study regions based on the benchmarking exercise, and other considerations about the characteristics of the local grain supply chains such as proportion of production and processing employment.

The benchmarking exercise is also vital for extending the case study findings across other LGAs in each grain region. The stories from places in the top quintile can be interpreted and implications drawn for lower quintile places.

CASE STUDIES

THE VALUE OF GRAINS TO GOONDIWINDI

Diverse range of cropping, including irrigated and non-irrigated crops, employment in grains production and value add aspects of the local supply chain.



DIRECT GRAINS EMPLOYMENT Source: ABS, 2016

419 GRAIN PRODUCTION JOBS = 9% OF LOCAL EMPLOYMENT



195 jobs in general grain growing



134 jobs in mixed grain-livestock enterprises



90 jobs in cotton growing*

20 GRAIN-RELATED JOBS



20 jobs in grains storage services

* Note: all cotton farms also grow grain

GRAINS PRODUCTION

644,000 TONNES



\$280.7 MILLION



These values vary with the seasons

Source: ABS, Agricultural Census, 2015-16

CASE STUDY KEY THEMES



Global reach of the region



Tight labour & skills market



Agricultural workforce elasticity



Drought & water security

MAIN GRAIN CROPS PRODUCED



WHEAT



BARLEY



COTTON



SORGHUM



CHICKPEAS & PULSES

THE VALUE OF GRAINS TO GOONDIWINDI



OVERVIEW – GOONDIWINDI REGION, QUEENSLAND

Goondiwindi is a council area in the Northern Growing Region, on the Queensland side of the QLD-NSW border, 4.5 hours inland. The town is built around the Macintyre River and the water resources it provides. Agriculture is a major industry in the region, including growing grains such as wheat, oats, barley, sorghum, chickpeas and pulses, hay and fodder crops and cotton, as well as beef cattle, pig and sheep production and some horticulture.

The case study site of Goondiwindi was chosen because it is a region where the grains industry was benchmarked as ‘Most Important’ under the quantitative analysis portion of this research (see section on Benchmarking). This category refers to the top 20 per cent of regional LGAs, where based on employment, gross value and volume the region measures highly on a national scale.

In 2016, there were 4,785 people employed in Goondiwindi council area and of these 419 peopleⁱ were employed in grain production occupations such as grain, cotton, pulse and integrated grain-livestock production. This means 9 per cent of the workforce were employed in grains which places the region in the top bracketⁱⁱ across the country for the proportion of people employed in grains. There were a further 24 people employed in other grain related jobsⁱⁱⁱ in grain storage services, which is a low-moderate scale for regions employing these other grain related jobs nationally.

While these numbers may seem small, for a place of its size this is a significant proportion of the total Goondiwindi workforce. This was confirmed using a quantitative Location Quotient Analysis (see the Methods section of this report at Appendix A). Location Quotients are a quantitative measure of the specialisation of a region’s employment in a given industry, against the national average for employment in that industry. Scores are generated to demonstrate the magnitude of the industry’s importance in the local economy. Grains employment scored well above the national average for a place of its size scoring 26.8 (which is in the second highest bracket) for grains production and 1.82 (which is in the third highest bracket) for other grain related employment, where scores of 1 are above the national average for employment in these jobs categories). Scores are generated to demonstrate the magnitude of the industry’s importance in the local economy. This analysis shows that in

Goondiwindi, the concentration of grain production employment is 26 times the national average. The grain industry also contributes to employment and business activity in other parts of the local economy.

The grain industry accounts for approximately one third of all local agriculture, forestry and fisheries jobs. Figure 7 shows local employment in the broader agriculture, forestry and fishery industry compared with other major local industries. In this figure, the agriculture, forestry and fisheries industry employs 1,330 people, which is more than double the next largest industry which is Retail Trade (488 jobs).

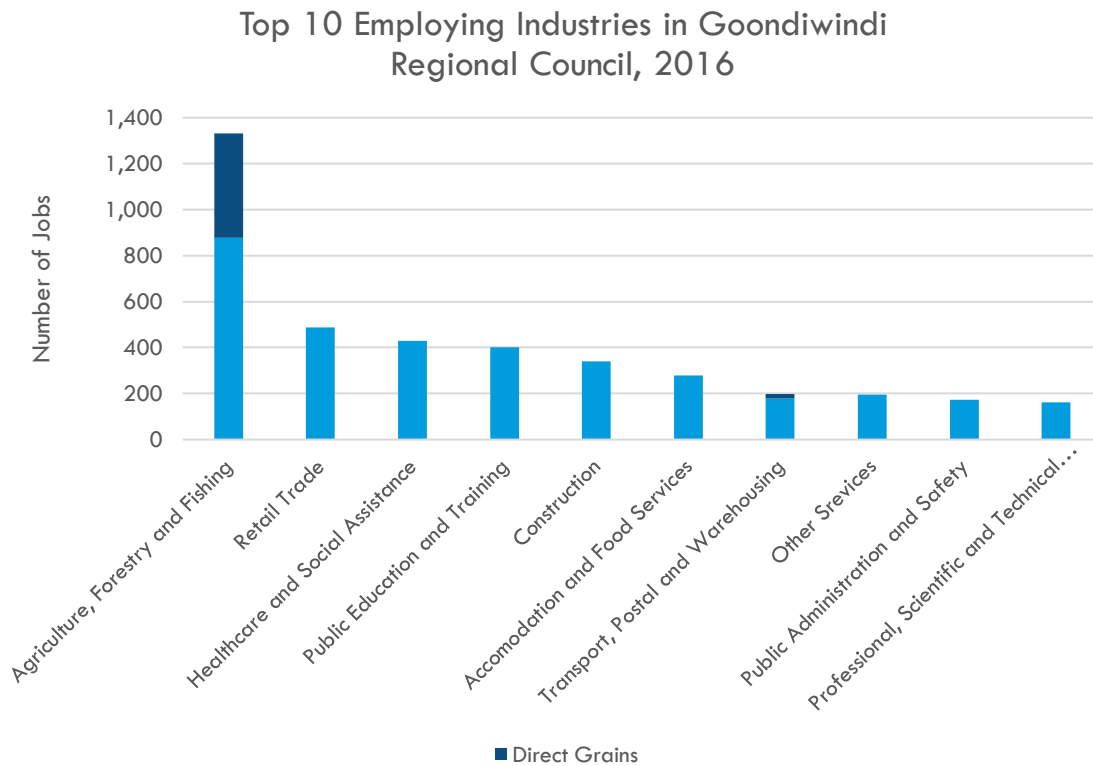


Figure 7: The top 10 industries by employment in Goondiwindi, where direct grains related employment is highlighted in orange, 2016^{iv}.

Goondiwindi is also in the top bracket for the highest volume and gross value of grains produced. Goondiwindi produced 645,000 tonnes of grains worth \$280 million in 2015-16^v. Even though agricultural is a highly seasonal industry, this is a snapshot of a fairly typical year. The grain infrastructure underpinning Goondiwindi's grain industry includes two primary grain receival sites, three secondary receival sites which are used only in exceptional years and two cotton ginning facilities, which process cotton by separating the seed from the fibres. These grain infrastructure sites are located in the town itself, as well as to the west and east (Figure 8).

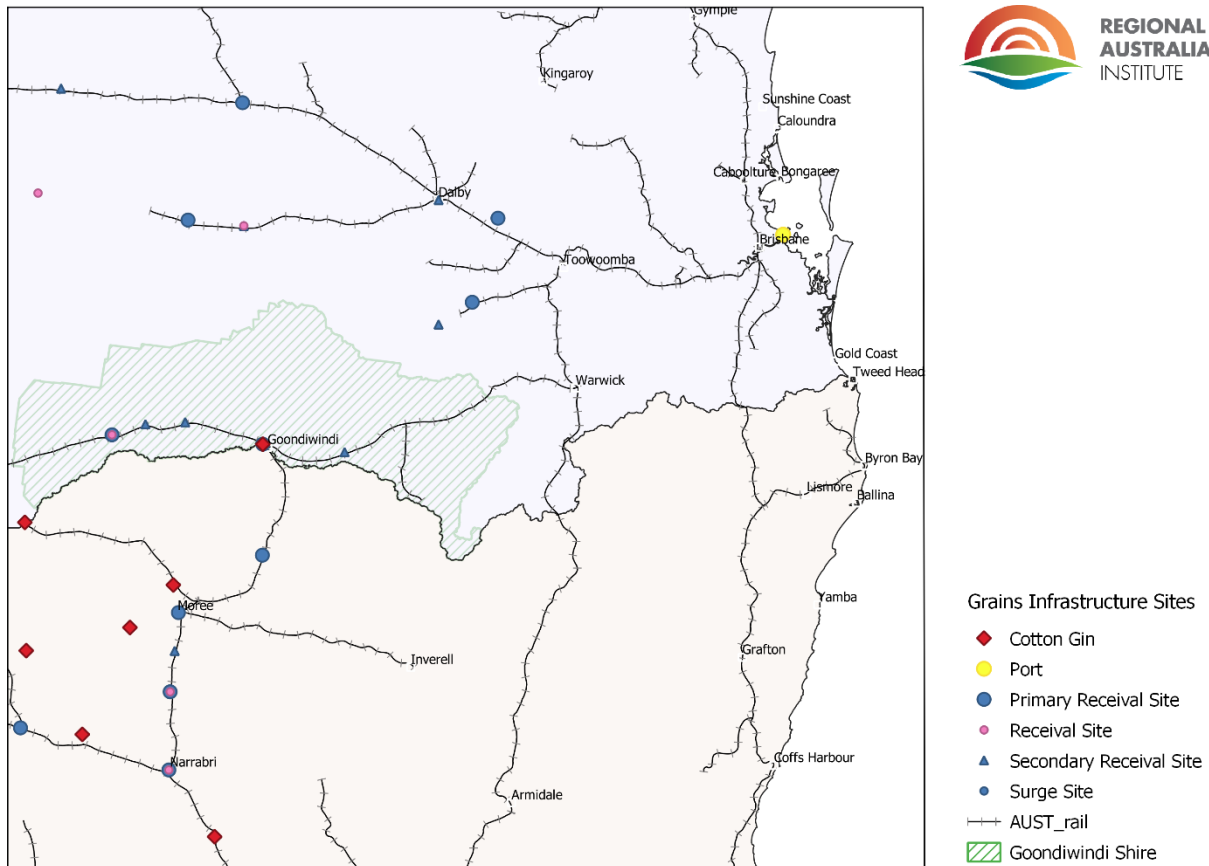


Figure 8: Grain assets in the surrounding region, where Goondiwindi has two cotton gins and a GrainCorp secondary receive site to its west and a GrainCorp secondary receive site to its east. Not shown on this map is the cotton packing and cotton warehousing facilities in Goondiwindi^{vi}.

Given Goondiwindi is benchmarked as Most Important, we wanted a better understanding of what this looked like on the ground and to further explore the flow on employment and business activity which results from grains production in the region.

To this end, we conducted semi-structured interviews in the region with 12 people in Goondiwindi from across different parts of the local grains supply chain and local leaders.

There were a number of themes which arose through discussions with community members involved in the supply chain and those in formal and informal leadership roles. These provide insights into how the grains supply chain operates and the influence of the industry on other local business activities and employment. The key themes which came from these interviews include:

- Global reach of the region
- Tight labour and skills market
- Agricultural workforce elasticity
- Drought and water security

These themes are discussed in greater details in the following paragraphs.

GLOBAL REACH OF THE REGION

Grain production employment is 26 times the national average concentration for a council region. Therefore Goondiwindi Shire has a strong specialisation in grain production. This means that it is a regional economy where grain production really matters for local employment. Regions that specialise in a given industry are also better able to demonstrate the capability to be competitive in global supply chains. This was echoed by interviewees through the qualitative stages of this project, where many grain businesses and growers indicated the strong globally facing nature of the local grains industry.

The Goondiwindi grain industry operates in a highly export-import market, rather than trading domestically or with nearby regions. Interviewees talked about many of the inputs, such as chemicals and fertilisers, being bought from overseas and transported to Goondiwindi directly from the port in Brisbane and often with a stop in Toowoomba on route. Similarly, much of the agricultural products produced in the region are transported by trucks to the Brisbane port via Toowoomba and exported to overseas markets.

Interviewees indicated that a high proportion of local grains and cotton seed are valued added locally through beef feedlots before being exported overseas. This means that local grains are fed to cattle and converted into beef products which are sold at a much higher premium. There is also discussion that there might be an abattoir built in the region to capitalise on the full spectrum of beef value add. If this comes to fruition, there would likely be another 100+ jobs in the region as a result of local agricultural activity.

One interviewee estimated that 80 per cent of transport in Goondiwindi was for agricultural needs. There are a small number of local transport suppliers in Goondiwindi but some interviewees suggested that largely national companies are used. Interviewees talked about how growers often have deals with transport companies so trucks transport grains and raw product to the port in Brisbane and return filled with fertiliser. This allows for cheaper transport costs while offering greater volume certainty for transporters.

There is some agriculture business to agriculture business transactions locally. There is a degree of buying and selling stock between local businesses to ensure customers product needs can be met and adjust for accuracy of seasonal predictions. One interviewee mentioned that local agricultural businesses need to predict seasonal outlooks so they can order chemical and fertilisers from overseas a year in advance.

The key commodity supply chains in Goondiwindi are strong, long term and very established. They are highly connected into the global supply chain and the region is able to take advantage of their specialisation in this.

TIGHT LABOUR AND SKILLS MARKET

Goondiwindi has a tight labour and skills market which has implications for the local grains businesses and local agriculture industry more broadly. Many interviewees spoke about the very tight local labour market, meaning there were few appropriate workers to fill the variety of vacant jobs resulting in high competition between businesses to secure the necessary labour. This is echoed by quantitative data which shows Goondiwindi had a low unemployment rate in 2016 of 3.6 per cent^{vii} and the region is located in the broader Toowoomba and South West region which had a high job vacancy rate of 1,171 jobs in August 2016^{viii}.

The difficulty is both being able to source workers to fill jobs, but also sourcing people with the appropriate skill set to perform the roles. Meaning there is also a tight skills market in Goondiwindi.

The inability to fill positions in local businesses was seen as a factor which may limit growth by one larger local business in the grains supply chain. Interviewees spoke about this being an issue in both the agricultural sector and other industries in town which rely on the success of grains. One business owner said it was difficult for businesses to offer perks or special conditions to entice workers, because everyone in the town was offering the same.

Interviewees mentioned that this tight labour market was exacerbated by low availability of specific skill needs in the region. Many agricultural jobs require a specific skill set which can be difficult to source. When asked about the implications of the mining industry on local agricultural workforce availability opinions differed between interviewees. Some suggested the mining industry was of limited concern because different skills are needed for the two industries and competition for the same skills was limited. One interviewee mentioned that competition between agriculture and mining for skills was a bigger issue in the past, particularly with skilled machinery drivers and mechanics relocating to mining regions. Another interviewee said their business was employing an auto electrician from Ballarat, Victoria because this skill was in demand and not available locally. The interviewee did not make the connection directly, but auto-electrical skills are sought after in both the mining and agricultural industry and this may be an impact of the mining industry further west or just a shortage of these skills generally.

In an effort to fill local skill needs, one interviewee from a large local company spoke about locally based workers being the first preference, but sometimes needing to source remote workers as a secondary option. This was believed to be because skilled people may be reluctant to move their whole families to the town for employment. The same business mentioned the difficulties of sourcing niche and specialist skills, such as food biologists. The difficulty sourcing appropriate labour and skills also meant that one large company had already outsourced their marketing and human resources needs to companies in metropolitan cities because the skills were not available locally.

Marketing and human resources are examples of skills that are known as knowledge intensive business services (KIBS) which are important for businesses to expand. Occupations such as legal, accounting, design, marketing, human resourcing are all needed by growing businesses and are one indicator of a rich local business network^{ix}. Quantitative data shows that Goondiwindi has a low proportion of these professions (3.2 KIBS professionals per 10,000 workers) to support local businesses which are looking to grow^x. This, however, is common for areas outside of the metropolitan centres and it means that

regional areas need to be innovative to ensure these business needs are met, or else source them from outside the local community. However, Goondiwindi does have some strong local champions and good human capacity to bring about change based on local ingenuity and drive to help the local community to succeed. One example is the newly created Goondiwindi innovation network.

These changes do take time and some of the larger businesses mentioned that it might make sense to relocate to larger centres where they can be assured of finding the required staff and skills, however this is an individual business decision and other factors contribute to this choice. Another interviewee from a large business mentioned feeling a social responsibility to the town and supporting it through employment, even though it may be a stronger business decision to relocate into a larger town or metropolitan centre.

Technology may bring a change in the types of labour and skills required locally to support the agriculture industry. Some interviewees noted that there has been growth in agtech and agronomy agtech employment opportunities. This was believed to be associated with the influx of new technologies and big data, meaning more information is available about farm production but more expertise is needed to interpret the data and decide a course of action for each grower's business. One interviewee believed these new technology and information rich occupations were the types of jobs for young people to fill, such as young people returning from university or boarding school. Others talked about technology as the cause of reduced agricultural jobs. The interviewee talked about how the industry had transitioned to much larger and faster trucks and machinery, which means that farming can be done faster and on a bigger scale with less people. This is a trend which has been observed more broadly across the agriculture sector where improved production processes and increased mechanisation, for example through bigger, faster and more efficient machinery and transport, has meant that more agricultural product can be produced with fewer workers^{xi}.

One interviewee believed that the low availability of skilled agricultural workers was a result of missed education of a generation of children growing up, which is being felt now that they are the primary age group in the workforce. The interviewee suggested that efforts need to be made to prevent this happening to future generations, creating another lag effect and low labour availability in the future. Instead the interviewee suggested that agriculture as a whole needs to combat perceptions in young people that the industry is hard work, that there is no money in it, or that it is an industry which is cruel to animals, mistreats the environment and is outdated.

REGIONAL WORKFORCE ELASTICITY

Many interviewees attributed Goondiwindi's presence to the industry, with the production of grain-cotton-pulses and the resultant flow on business activity and employment that occurs in the region. However this agricultural industry is highly seasonal and variation in weather patterns, and particularly water availability, have a bearing on the gross value it creates and the workforce it can support.

The qualitative portion of this research was conducted in July 2019, when Goondiwindi was in a drought. Interviewees said the need for people to fill jobs would quickly increase once the drought breaks and they were uncertain where these people would come from. These seasonal changes lead to an elasticity in the local labour market as many workers are needed in good seasons and less in the dry seasons.

Interviewees said that the tight labour and skill market in Goondiwindi means that businesses work to keep their staff even in dry seasons. This was mentioned by business owners themselves as well as community leaders. Businesses said that if they let workers go in drought seasons that they may not be able to get the workers they need when the good seasons arrive and staff are in demand across the different businesses in the community.

During the interviews there was one example of a station hand losing employment, meaning he and his partner also lost their housing associated with the position and needed to relocate into town where there is a tight labour and rental market. Meaning potential difficulties sourcing a new job but also a new home. While businesses are trying to keep their staff some businesses have had to reduce the hours of their staff in order to try and keep them and remain viable. Local transport companies are struggling with the drought because there is limited agricultural product to transport to the port and low fertiliser orders as growers estimate another poor season ahead. Machinery dealers are also facing difficulties as growers hold back on spending on new machinery and maintenance.

Interviewees mentioned that one source of labour which is commonly reduced during dry seasons was work by overseas workers. Casual and contract workers are also highly impacted. Two interviewees talked about how in dry seasons there is a tendency for growers to do tasks themselves rather than using contractors. For example, during the drought there is a reduced use of spray contractors because there are minimal weeds growing so the growers can do this task themselves rather than employing another person. One interviewee postulated that some contractors might be looking to Western Australia for work while the eastern states continue in drought. This was confirmed during the Beverley case study for this project.

The casual workers in one agricultural business were essentially full time when there were back to back good seasons. Which meant that a casual worker could be employed 'full time' over successive good years, however because they are officially recorded as casual workers, the loss of these effectively "full time" workers is not captured in national quantitative data.

Another interviewee mentioned that agronomists may choose to leave the region based on water availability for the next season. If seasonal predictions lean towards a dry season, they may choose to relocate to regions with better forecasts where they think work may be more readily available.

One interviewee talked about the flow on implications this has for the broader town, where there are not the same volumes of people in town or workers spending money on accommodation, food and other products and services offered by the town's businesses. In this way, the seasonal down turn in agriculture has both economic and employment ramifications outside of agriculture.

This impact is also felt by small businesses when usual residents cut spending in the face of uncertain yields. One interviewee said some of the local growers were managing the drought quiet well, financially because interest rates are low and they are taking action to cut luxury spending, such as new cars, going to the pub, getting hair styling, and holding off services such as machinery servicing or putting people in new offices. This means the impact of reduced grains production is having widespread economic and social ramifications throughout the town and especially in small businesses. The impact is especially pronounced for businesses with a high dependence on farmers as customers,

such as rural support businesses, and those which produce ‘discretionary purchases’ which can be done without. This has also been observed in other regional communities, during the Millennium Drought^{xii}.

DROUGHT AND WATER SECURITY

One interviewee talked about the Macintyre River as the “*biggest opportunity and biggest threat*” to the community. This comment referred to the seasonal variation in water availability, the ability for the water to provide economic and social opportunities for the community as well as the ability to threaten it.

This sentiment is particularly true in the grains industry and broader agricultural sector. The region has a mix of dryland and irrigated agriculture, both which need reliable rainfall. One interviewee spoke about the diversity of local grains – grains, cotton and pulses – adding to the resilience of the local grain growing sector but also spoke about the different economic flow on effects from these grain crops. For example, a good grain season releases a lot of money through the town whereas cotton is more consistent but less widely felt.

The drought has changed pricing signals and, for some, the purchasing patterns of grains businesses. One example was a business shifting to pass on price rises to the consumer.

One interviewee spoke about the difficulty of growing grains under conditions with water allocation uncertainty and suggested that greater water and business security was needed for the region. The interviewee spoke about the need for more water infrastructure and the potential of tapping into neighboring rivers for water. The interviewee felt that the government handling of water issues had not been done well and local farms have unused irrigation systems as a result of not being able to access their full water allocations.

It was mentioned that drought could be a catalyst for changed farm practices in the region. Times of adversity breed innovation and it was suggested that this could be a situation to stimulate changed management practices. There have also been feasibility studies in the region looking at high value, low water use crops such as blueberries. However one interviewee wondered how successful this might be considering the local supply chains for these products had not been developed yet and it would take some time and cost to establish.

One interviewee expressed concerns that the general public does not understand farming and that there are many arguments against agriculture, which are perpetuated especially through social media. This was around water use, environmental impact and animal welfare in particular. The interviewee noted the voices in the farming sector were not being heard to the same degree or able to respond to false claims. The interviewee talked about the importance of education and getting the farming sector voice heard, which some local businesses do through tours for tourists.

THE VALUE OF GRAINS TO INDIGO

More diverse agricultural region with the main grains employment a much smaller proportion of the local workforce and very concentrated in the value add aspect of the local supply chain



DIRECT GRAINS EMPLOYMENT Source: ABS, 2016

46 GRAIN PRODUCTION JOBS



33 jobs in general grain growing



13 jobs in mixed grain-livestock enterprises

136 GRAIN-RELATED JOBS



85 jobs in cereal, pasta & baking mix manufacturing



51 jobs in prepared animal & bird feed manufacturing

GRAINS PRODUCTION

21,000 TONNES



These values vary with the seasons

\$6.6 MILLION



Source: ABS Agricultural Census, 2015-16

CASE STUDY KEY THEMES



Employment in grains value add



Diversity of agriculture commodities



Grains potential in the future

MAIN GRAIN CROPS PRODUCED



WHEAT



BARLEY



CANOLA



OATS

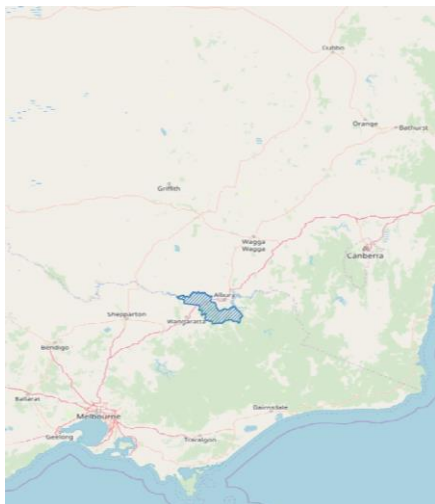


TRITICALE



FODDER CROPS

THE VALUE OF GRAINS TO INDIGO



OVERVIEW – INDIGO REGION, VICTORIA

Indigo is a shire in the Southern Growing Region, south of the neighboring border towns of Albury, New South Wales and Wodonga, Victoria. In 2016, the region had a workforce of 7,122 full and part time workers. Agriculture is one of several industries which are important for the economy and employment of the region. The agriculture industry is highly varied in this region, particularly with variation between the low lying plains around Rutherglen verses the hillier and wetter climates around Beechworth and Yackandandah.

The agricultural commodities grown across Indigo Shire include beef cattle, sheep, dairy cattle, poultry, pigs and wine, and the grains are hay and fodder crops, wheat, canola, oats, triticale. The diverse climate and soils in the region also allow for production of a range of niche products which only one or few businesses produce like specialty cheeses, berries, mushrooms, apples, hops for beer, pears, lettuce and cherries.

In the Benchmarking section of this report, Indigo Shire was benchmarked as a region where grains is of Moderate Importance. This is because while the grains industry is an important employer in the region, the region has a greater diversity of industries and other commodities which support local employment and economic activity.

In 2016, there were 46 people directly employed in grains production which is fairly low by both raw number and proportionally against other jobs in the region (grains production is 0.6 per cent of local employment). The region also had 136 people employed in other grains related employment, which for Indigo is in the value adding component of the local grain industry, which will be explained further in later sections of this report. Indigo Shire was fairly low in terms of the volume and gross value of grains produced in 2015-16 compared with other grain growing regions, with approximately 21,000 tonnes of grains worth \$6.6 million produced across the region in 2015-16.

Indigo Shire has minimal grain infrastructure with no receival sites in the region, but some in the surrounding regions (Figure 9). The local industry predominately uses trucking for transport and has some rail access in the north-west of the region. One interviewee however mentioned that the cost of rail connection is a barrier to its use.

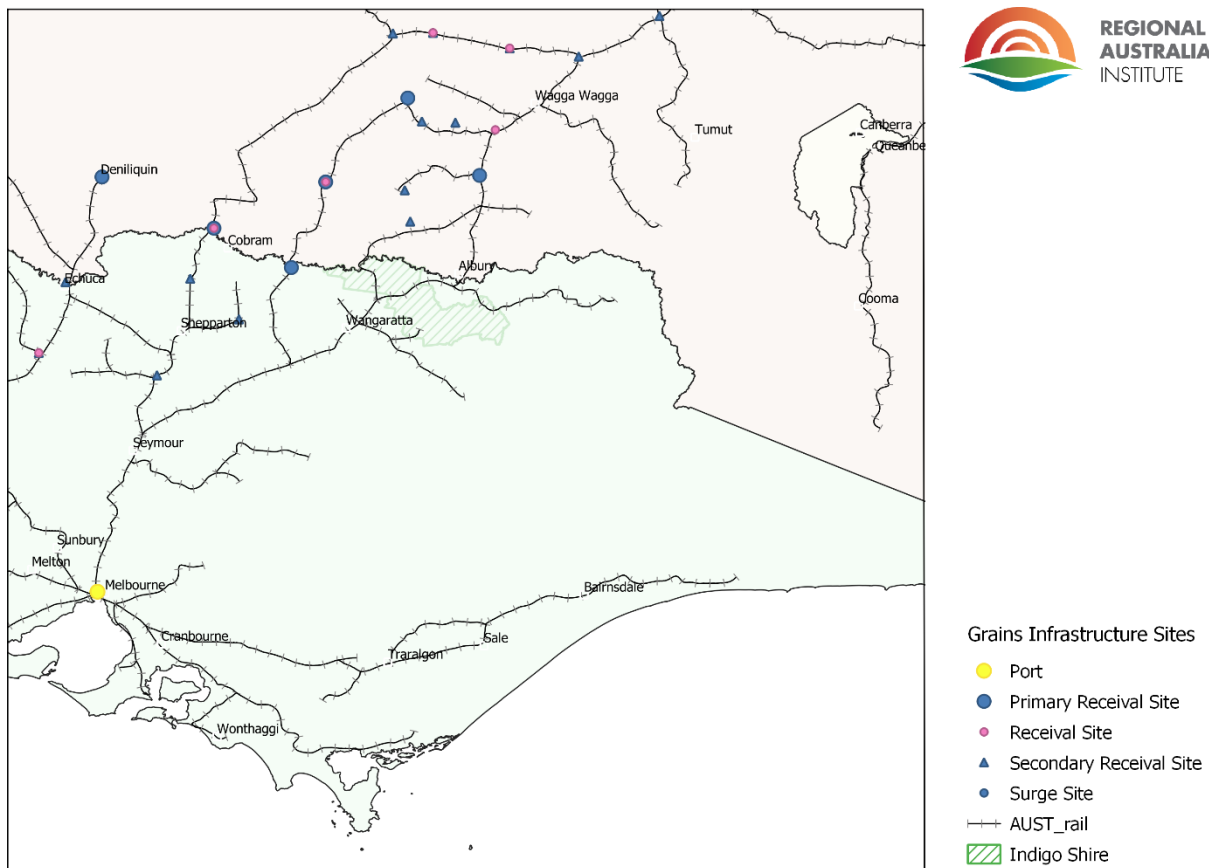


Figure 9: There are no grain receive sites in operation in Indigo Shire. The nearest primary receive sites are in Henty to the north and Yarrawonga to the west. Both of these are owned by GrainCorp.

Semi-structured interviews were conducted in the region with 8 people in Indigo Shire from across different parts of the local grains supply chain and local leaders. This was done to build a stronger understanding of local grains employment and flow on business activity.

From these interviews, the following key themes emerged:

- Employment in grains value adding
- Diversity of agriculture commodities
- Grains potential for the future

These themes are discussed in greater details in the following paragraphs.

EMPLOYMENT IN GRAINS VALUE ADDING

In 2016, there were 136 people working in other grains related occupations in Indigo Shire. These are not grain production jobs but are instead grain processing and value adding occupations. This level of employment, places the region in the second highest quintile for the number of other grains related jobs, but this is a moderate proportion of the overall jobs in the region (2 per cent).

In Indigo, these jobs are almost entirely attributed to stockfeed (51 jobs) and cereal manufacturing (85 jobs). This makes Indigo Shire, and its neighboring Federation Shire, two of only three regional councils

in the top 10 highest employers for cereal, pasta and baking mix manufacturing occupations. Most council areas with a large number of these jobs are in metropolitan areas.

Federation, Indigo's neighboring council, has a similar number of other grains jobs. For Federation, there are 80 jobs are cereal, pasta, baking mix manufacturing jobs and 58 jobs are prepared animal and bird feed manufacturing jobs while for Indigo there were 85 cereal, pasta, baking mix manufacturing jobs and 51 prepared animal and bird feed manufacturing jobs. These towns are separated by the Murray River and are in different local government areas, Wahgunyah being in Indigo Shire and Corowa being in Federation Shire. A number of these jobs are based in the industrial zones in the two towns of Wahgunyah for Indigo and Corowa for Federation, creating a strong cluster of these jobs which is arbitrarily split by the council boundaries.

For Indigo Shire, the highest employing industry is health followed by manufacturing where the biggest contributing sub-industry is food and beverage manufacturing (Figure 10). This includes grain milling and cereal production but also some dairy, wine and bakery products. The next largest employer in the region retail trade, which has some influences from the local tourism industry, then the services-based occupations of education and training, and public administration and safety. This is followed by agriculture, forestry and fishing, where grains is a small proportion of a much more diverse array of commodities.

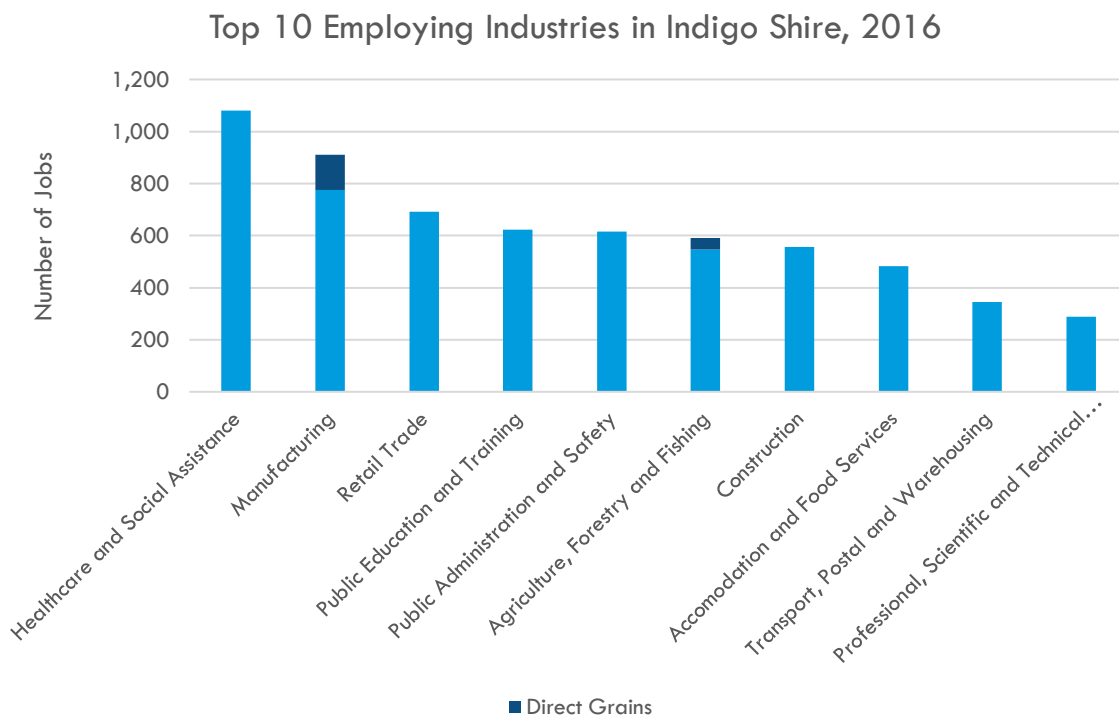


Figure 10: Industries which employed the most people in Indigo Shire in 2016. A significant contributor to manufacturing is food and beverage processing. Direct grains employment is highlighted in orange.

Interviewees suggested that the grains used in Indigo's major grains value add businesses are largely supplied from the local region and surrounds. Some locally produced grains may be exported, but it is largely a tight system where locally produced grains are used locally before being sold outside the region. This is particularly true in dry seasons and periods where the crop is smaller and there is less raw grain available to service both the local value add businesses as well as export markets.

For the Indigo and Federation council areas, a small number of businesses account for this large number of jobs. Two major businesses that were interviewed employ largely from the local town and some more specialised workers generally coming from further afield. One interviewee said highly qualified workers move to the region and take jobs with their business because it is a very particular industry there is only in a small number of places in Australia where you can build this type of career. Another interviewee said that managers, across many different industries including agriculture, travel to work from places such as Wangaratta. This matches quantitative data which shows a moderately-high concentration of managers living in Wangaratta (17.60 per cent of total employment^{xiii}).

Both major businesses rely on a high number of transport jobs. These workers are employed by predominately national transportation companies and the businesses often contract a few different companies to meet demand. One business also contributed to nearby packing shed jobs which are not classified as grain industry jobs, but they are a big flow on employer.

DIVERSITY OF AGRICULTURE COMMODITIES

The geography and climate of Indigo Shire means that there is great diversity amongst the agricultural commodities grown. Particularly there is a difference between the south-eastern and north-western parts of Indigo Shire which influences what can be grown. The south-east is generally wetter, higher and hillier than the north-west. The south-east has higher average annual rainfall than the areas closer to the border, with 956mm and 942mm per year in Beechworth and Yackandandah but 694mm and 584mm in Chiltern and Rutherglen^{xiv}, yet by distance the towns are relatively close with only 55km between the furthest two towns. The elevation also varies across the region, with the south-east at a higher elevation and with more mountainous topography, at 580m in Beechworth vs 169m in Rutherglen^{xv}. The south-east also has hillier topography compared to the flat areas around Rutherglen in the north-west.

Together, these conditions result in a different mix of commodities grown in the south-east vs north-west parts of Indigo Shire. For example, interviewees noted that the north-west, around Rutherglen, suits broad-scale grain production, whereas the south-east has smaller farms which produce horticulture, dairy, beef and other products. This is echoed in quantitative data where the geographic area around Rutherglen^{xvi} accounts for almost all of the grain production and grain related employment and the remaining 5 people are employed in mixed grain-livestock enterprises in nearby Chiltern. For the comparable area around Beechworth and Yackandanda, there were zero jobs in grain production. However there may be under 5 people employed in each of these areas due to ABS' randomisation to protect privacy in the cases of small numbers of individuals.

The different climactic zones within the Indigo Shire mean that agricultural industries are differently impacted by drought. The north-west around Rutherglen is more affected by drought and dry conditions than the higher more reliable rainfall patterns around Beechworth and Yackandandah. Interviewees did not report direct employment changes as a result of drought conditions, but one value add business reported that overall cost viability was a major factor in determining employment levels. The example was given that drought was no issue if grain and livestock prices went up simultaneously, but there was a problem if grain prices went up while livestock prices fell. One interviewee suggested that large value add grains businesses like theirs often considered the major fluctuations of climate in their business models which allows them to weather poor seasons.

The towns themselves are also quite different across the region, with different socioeconomic conditions and human capacity, but also there are differences in the industries which make up their local economies and employment.

GRAINS POTENTIAL FOR THE FUTURE

Some respondents mentioned the untapped potential of the Indigo Shire for grain production. The view was that there are opportunities to capitalise on the predicted climate changes and to better draw on the untapped human capacity of the region.

Some respondents indicated that in the south-east of Indigo Shire, climate change could provide opportunities for the region. Predictions show that the region is expected to benefit from continued relatively high rainfall as well as receiving warmer temperatures. One interviewee noted that this change could both increase the productivity of some commodities while opening up possibilities for new commodities to be grown in the region.

Some work has been done on this possibility by the North East Catchment Management Authority, together with six industry sectors and six local governments with funding from the Australian Government's National Landcare Program. The project aimed to help build understanding of what the farming sector could anticipate under climate change projections, at a regional scale^{xvii}. Modelling suggests that the broader north eastern Victoria region, which Indigo Shire is in, could expect an increase in canola production by 2030, while many other parts of Victoria are expected to decline. One interviewee suggested climate change could provide an opportunity to develop premium grains which are not already grown commercially in the region such as maize.

Another avenue for potential grains expansion could be barley to service Australian micro-breweries. The micro-brewing industry is relatively strong in Indigo Shire, but does not use locally produced grains in their malt. Instead these products are predominately sourced from overseas, such as Germany and New Zealand. One interviewee from a micro-brewery said that Australian malt is not suitable for this type of brewing, except for one upcoming brand in New South Wales which is expanding to serve this market. Generally, beer brewing requires a lower protein grain and more specific quality standards than milling and feedstock grains. Otherwise the local micro-brewing industry does make use of local horticulture commodities such as hops and seasonal produce for specialty products and flavours.

An issue to overcome in taking advantage of these and other future opportunities for grains would be improving local transport routes. Trucks are the primary form of transport to bring inputs into the region and take products out. Local roads are steep and winding which makes it difficult to scale up the truck and fleet sizes which service the regions around Beechworth and Yackandandah.

Interviewees noted that the townships of Beechworth and Yackandandah have a high proportion of tree changer residents. This is a relatively recent change for the area where people have moved from other locations, largely Melbourne or other big urban centers, and made these smaller towns their homes. People making the move include professional and young families which is a demographic that is sought after by a number of regional communities in Australia. Two of these interviewees had made

that life change themselves and were delighted with the decision. These are regions where the lifestyle and livability of the place are evident and are helping them to attract and retain populations.

This means that the local workforce has a high proportion of skilled workers who have trained and had careers before moving to these communities. Interviewees suggested this was a regional strength and an underutilised resource in the local economy and the agricultural industry. As is, these treechangers often need to create their own work such as through starting a business, undertaking short contracts or commuting to larger neighboring towns. This is the opposite problem to many other regional communities where it is difficult to bring new staff and skills to the region.

The region also has pockets of serious disadvantage and multigenerational unemployment. The nature of agricultural work could appeal to some of these individuals and people who are skilled with hands on tasks. There are some opportunities with young people in this untapped part of the workforce, particularly by providing early exposure to agriculture, work experience and mentorship.

THE VALUE OF GRAINS TO BEVERLEY

Raw export region with the local grain industry footprint extending over many nearby small towns



DIRECT GRAINS EMPLOYMENT Source: ABS, 2016

117 GRAIN PRODUCTION JOBS = 19% OF LOCAL EMPLOYMENT



57 jobs in general grain growing



60 jobs in mixed grain-livestock enterprises

CASE STUDY KEY THEMES



Large geographic spread of towns in the region to supply goods and services to the grains industry



Competition to access skilled workers with the mining industry and other operations



Two distinct workforce peaks during seeding and harvest where large numbers of casual staff are needed

GRAINS PRODUCTION

120,000 TONNES



\$37.4 MILLION



These values vary with the seasons

Source: ABS, Agricultural Census, 2015-16

MAIN GRAIN CROPS PRODUCED



WHEAT



BARLEY



CANOLA



LUPINS



FABA BEANS



FODDER CROPS

THE VALUE OF GRAINS TO BEVERLEY



OVERVIEW – BEVERLEY REGION, WESTERN AUSTRALIA

Beverley is a shire in the Western Growing Region, 1.5 hours east of Perth. Agriculture is a major industry in the region, particularly broad acre cropping and livestock production. The grains produced include wheat, canola, barley, lupins, faba beans and fodder crops. Livestock are the next largest agricultural commodity in the region, predominately sheep and some poultry, however there has been a contraction of sheep numbers in recent years as local farmers respond to market signals.

When benchmarked against other regional areas (see the Benchmarking section of this report), Beverley was categorised as a region where the grain industry is of Moderate Importance. When compared against Western Australia alone, Beverley fits into the 'Fairly Important' category, which is a slight variation from where it sits against the national picture. This change may be attributed to the slightly lower yields in the state compared to those in the eastern states, which operate under different growing conditions, and other associated differences in the Western Australian grains industry.

In 2016, there were 117 people directly employed in grains production, though this does not account for the contract, casual and seasonal workforce. This is considerable when you note that the total employment for Beverley Shire was 598 jobs, meaning grains production directly accounted for 19 per cent of local employment. Figure 11 shows how this compares to employment in other industries in the region, with agriculture, forestry and fishing industry being the largest employer and grains being a significant contributor within this. By proportion, Beverley Shire is in the top 20 per cent for regions where grains production is a high proportion of employment compared to other occupations.

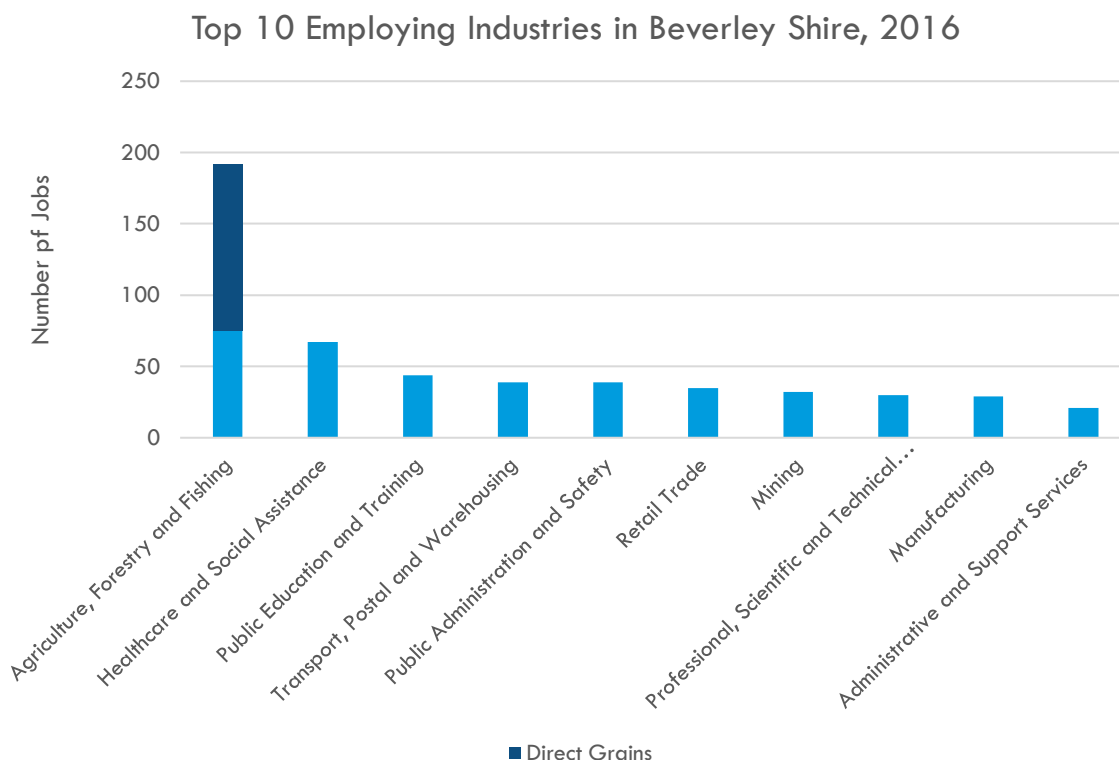


Figure 11: The top 10 industries by employment in Beverley, where direct grains related employment is highlighted in orange, 2016.

Beverley Shire had no jobs in other grains related employment which includes the value add component of the grains industry. This is not unexpected considering the region is predominantly a bulk, raw export producer and grains produced in the region are typically destined for overseas markets and some sold interstate. This means local grains are typically transported from farms to grains receival sites, then to Perth and Fremantle ports and overseas markets, in raw form.

Raw exports is a strength of this region but there are limited grains value add businesses in the surrounding region. One interviewee attributed this to the cost of labour in Australia compared to other countries as well as its arduous administrative, insurance, occupation health and safety and compliance processes. There is limited feedlotting in the immediate and surrounding regions as well, which is another grains value add product. This could be because the cattle herd in Western Australia is far smaller than other states, with 2.1 million head of cattle in Western Australia compared with 11.1 million in Queensland, 5.3 million in New South Wales and 3.6 million in Victoria^{xviii}.

The main grains infrastructure in the region and surrounds are the receival sites at York and Brookton, just outside of Beverley Shire (Figure 12). These are primary sites managed by Cooperative Bulk Handling Group (CBH Group). There are also secondary receivals sites within the shire at Kokeby and Dale which are used seasonally, there is another site at Beverley itself however it operates as a surge site only very seldom, meaning it is effectively closed.

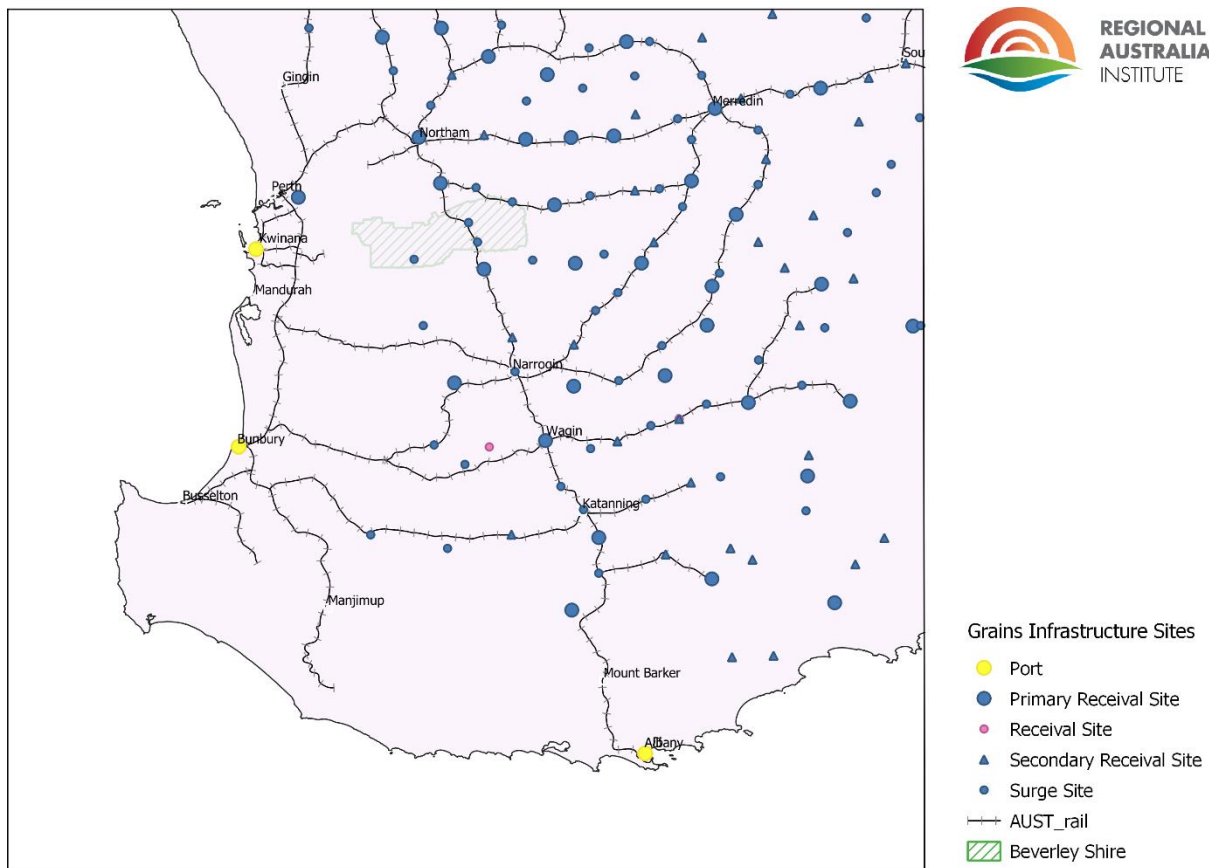


Figure 12: Grain infrastructure surrounding the Beverley Shire. Grain receive site data sourced from CBH Group’s receive site map^{xix}.

In both the national and state picture, Beverley Shire is a moderate producer in terms of grain volume and grain gross value. That is that they are not in the bottom 40 per cent or top 40 per cent by tonnage or gross value per year. Beverley fits into the ‘Fairly Important’ category, when compared against Western Australia alone, which is in the top 40 per cent.

Semi-structured interviews were conducted in the region with 11 people in Beverley Shire from across different parts of the local grains supply chain and local leaders. This was done to build a stronger understanding of the local grains employment and flow on business activity. From this, three key themes emerged about local grains employment and business activity. These were:

- Geographic spread supporting grains business
- Twin workforce peaks
- Access to skilled workers

These themes are discussed in greater details in the following sections.

GEOGRAPHIC SPREAD SUPPORTING GRAINS BUSINESS

The geographic spread of the population in Western Australia is concentrated in the south west corner of the state. Across the eastern parts of the wheatbelt there are fairly consistent low populations which means there is generally greater distance between larger populations and service hubs, compared with some eastern parts of regional New South Wales which have some larger regional centres dotted in the eastern inland regions (Figure 13).

Many of the interviewees suggested that this population distribution results in greater movement and transactional activity between towns, as business owners and producers travel to procure goods and services. This means that much of the Beverley grains industry contributes to employment and flow on business activity in neighboring council areas. Grain production in neighboring council areas similarly affects Beverley's employment and business activity.

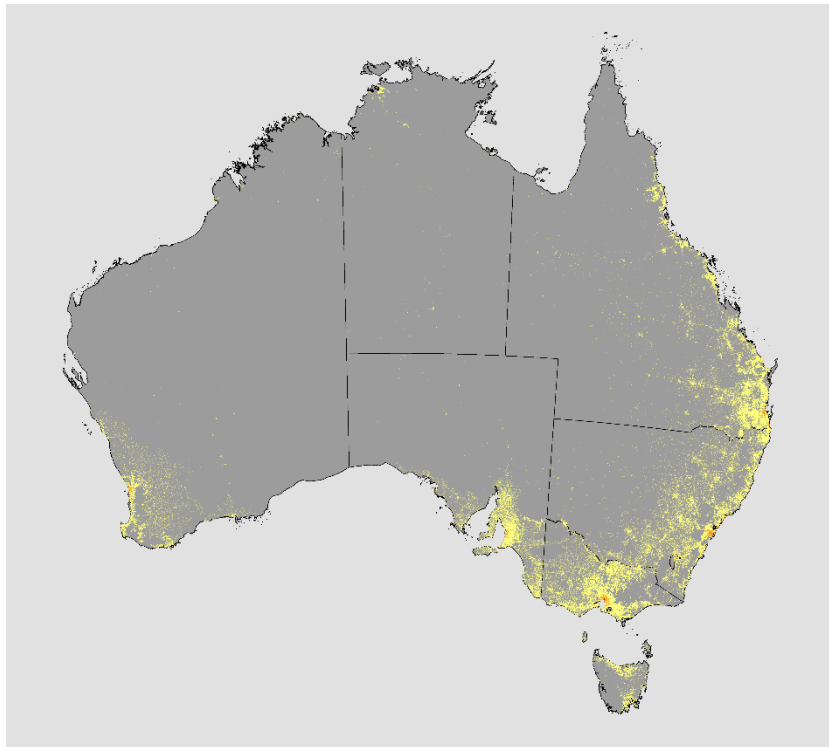


Figure 13: Distribution of Australia's population with the darker yellow colours indicating a higher population density. Image credit ABS^{xx}.

Responses from interviewees suggested that there is much broader geographic reach of grain growing activities across a series of nearby towns (within a few hours drive). This trend does not appear to be specific to the agriculture industry but it is an important consideration when looking at the employment and business activity generated as a result of the grains industry. Service professionals in the region also offer call out services, where they will drive to the customer. For these occupations, it is possible that one service professional will work across a number of council areas and thus Beverley Shire cannot be considered in isolation of the surrounding workforces.

Grains industry farming inputs came from a broader surrounding regional area, rather than just Beverley Shire, as well as some inputs from Perth and overseas. Most interviewees expressed a desire to purchase from local businesses, but sometimes chose to purchase slightly further afield for a range of individual reasons such as perceptions of better value or quality. Many talked about hours driving between towns as part of normal business activity. However the nature of some products means that they may be sourced from further afield. Chemicals were the product all interviewees sourced from overseas, from companies such as Syngenta and Bayer, often via a local seller or one in the surrounding regions. Local sellers and those in the surrounding regions were a source of consumables for some growers. Products such as gypsum and lime were more likely to come from domestic markets in both the local region and others from other parts of regional Western Australia. Fertiliser came

largely from other parts of Western Australia, including Perth, after initially being made overseas and imported by suppliers.

Grains industry services were sourced from Beverley Shire, the surrounding regions and the broader state. Transport services were predominately provided by larger trucking companies from outside Beverley and surrounding regions. However some individuals did draw on the local transport companies for some smaller jobs and some growers owned their own truck to cope with demand during harvest. Some interviewees noted that freight is cheaper in Western Australia than in other states, but rail connection is expensive. Other services like engineering, machinery and other technical services were often from Beverley and surrounding regions, including bigger nearby towns like Northam.

TWIN WORKFORCE PEAKS

One interviewee noted that the local grains handling company was the biggest employer in the region during harvest, followed by council and then a local machinery manufacturer. Data from the 2016 Census confirms that grains is the largest local employer even outside of seeding and harvest and even without including casual staff which are the most significant type of employees put on for harvest and seeding. These workers are grain-sheep farmers as well as solely grain growers. This is followed by high numbers of jobs in sheep farming and local government. Agriculture accounts for almost 2/5 of all jobs in Beverley Shire (39 per cent), followed by healthcare then public administration. This is similar for the neighboring council areas of Brookton and Quairading, with 40 per cent and 43 per cent of local jobs being in agriculture respectively.

Beverley Shire is characterised by high and reliable rainfall, with an average of over 400mm per year, largely falling in winter. The region, therefore, is usually less impacted by drought than some of the more variable grain production regions in the eastern wheatbelt and eastern states. However, frost can be an issue that reduces yields. This means there is less elasticity in the local grains workforce as a result of drought, but there are significant employment peak periods which coincide with seeding and harvest.

The grain workforce swells over these two periods, typically in April/May to June/July for seeding and starting from October and finishing around January for harvest, depending on the timing of rains. These twin workforce peaks use hundreds of additional workers, which are largely casual employees performing roles in grain receivals and storage businesses. These workers are often university students returning home to the region for summer employment. Being able to return to the region during school and university holidays and secure casual employment in the grain industry during harvest is one way young people can stay connected with the local Beverley community. Maintaining this connection could be part of helping encourage young people had to return to the community after a stint away. Some interviewees noted that when young people returned to the community after a period away, they often brought new ideas and ways of thinking into the community and local businesses. This was seen as reinvigorating and advantageous for the broader community.

Overseas workers also make up a high proportion of the workforce and are often from European or American farms and want experience in the Australian context. One interviewee noted that there is a local business which runs basic courses for overseas workers to assess their skills and experience before helping to match-make them to businesses who need workers over the seeding and harvest periods. Interviewees suggested that growers themselves did not typically use overseas workers, except

occasionally during the twin workforce peaks of seeding and harvest. One Beverley business which services the grains industry uses both local and overseas workers because it can be difficult to fill the roles needed. Some of these overseas workers are trained locally and have become permanent residents of the community.

One interviewee noted that a benefit of having a large number of grain growers in the Beverley Shire is that outside of the two peak seasons, growers have more flexible working hours and can use that to contribute to volunteering activities in the local school and community. Other local businesses that service the agricultural industry also played a strong role in sponsoring community events and creating livable communities.

ACCESS TO SKILLED WORKERS

Interviewees noted that the mining industry in Western Australia has impacted the ability of the agricultural industry to source skilled workers. In 2015, a Western Australian Parliamentary Committee reported that there were approximately 60,000 fly-in-fly-out mining workers in Western Australia^{xxi}. This is a substantial portion of the regional workforce, with 15 per cent of all regional employment in Western Australia being in mining and a further 11 per cent in construction, some of which is interlinked with mining activities. One interviewee believed this was particularly pronounced in Beverley and the surrounding regions, compared to those further east in the Western Australian wheatbelt. This is because access to the Perth airport is much more time efficient from Beverley and surrounding regions compared to further east in the state. This makes it more convenient for workers to drive to Perth airport and on to their fly-in-fly-out employment.

Occupations most affected by this competition for labour include those related to heavy machinery use, manufacturing and maintenance as well as engineering and tradespeople. These occupations are used in both the agricultural and mining industries. The mining industry can offer higher salaries for these occupations because the industry's profit margins are so high. While agriculture is a profitable industry, the scale is very different to the mining industry and this is reflected in wages offered to attract skilled workers. As at August 2018, the sector with the highest national median earnings was the mining industry at \$1,950 per week while agriculture, forestry and fishing was in the bottom five industries at \$944 per week^{xxii}. This dramatic pay difference is a trend that exists across different levels of education qualification. One interviewee believed however that agriculture can offer workers conditions more conducive to a standard family life, where workers can return home each night.

Findings from the interviews appear to be supported by quantitative data which shows high demand for skills which cross the agriculture and mining industry. Current data from the Commonwealth Government's Internet Vacancy Index which shows that for the larger Goldfield and Southern Western Australian region, which Beverley is in, that there are significant skill shortages in engineers, automotive and engineering trades workers and, machinery operators and drivers. These are occupations which often overlap with mining operations. For example in July 2019, for the whole Goldfield and Southern WA region there were 190 automotive and engineering trades worker jobs that were advertised as vacant as well as 221 machinery operators and drivers and 79 engineers^{xxiii}.

Interviewees suggested that they aim to keep good staff because there is competition locally for skilled workers. One interviewee said their grain growing business used older workers to fill their

skill needs, which meant using people who had earlier careers which included transferable skills such as tradespeople.

One grower interviewed noted the importance of hiring workers with experience and real world skills, rather than education alone. This view was particularly around the use of farm and heavy machinery because the high degree of technology in this machinery means each piece of equipment is expensive to mend or replace if damaged, as well as the cost of lost time while the machinery is repaired. The interviewee was operating a relatively small farming operation, where there would be considerable cost and opportunity loss in training a brand new worker. On farm graduate programs were mentioned as a valuable way of bringing new workers into the grains industry with education and experience, such as the Macquarie Group's two year program where participants are exposed to a variety of properties and commodities.

During the interview period, August 2019, there was a drought in Australia's eastern states. This meant some farm workers and contractors made the decision to temporarily move to Western Australia where employment options were more numerous. This provided some reprieve to local region's skills shortage this season as a result. One interviewee had temporarily moved to work in Beverley Shire while work in the eastern states had slowed. This individual's move was made possible largely through personal connections. Other skilled eastern state farm workers travelled to Western Australia for the 2018 harvest, alongside many overseas workers many of which have agriculture skills from their home countries. The enduring drought in the eastern states means that this is likely to repeat in the 2019 harvest but it cannot be assured that this workforce will be available once the drought breaks in the eastern states.

In an effort to close the agriculture industry's skills gaps, local schools in Beverley and York are working to build a pipeline and grow the next generation's agriculture workers. To do this they are engaging year 10 students in work experience that brings them onto farms and shows them what a career in agriculture could look like. This is part of a series of measures to showcase careers in agriculture.

SCENARIOS

The impact of the grain industry on local economies varies greatly from region to region. This is apparent from the benchmarking and case study analysis in this report. Table 5 summarises the key grains industry attributes of the case study regions which underpin this scenario section. Scenarios are an exercise to help conceptualise the future of the grain industry and what value it holds, or could hold, in different parts of regional Australia.

Table 5: Grains industry attributes of the three case study regions

Goondiwindi	Indigo	Beverley
Diverse – irrigated and non-irrigated; grain production and grain related jobs	Value add focused – grains employment in the value add aspect of supply chain	Raw export region – strong grains production focus
Grains production and processing employment	Grains processing employment largely	Grains production employment largely
419 grains production jobs	46 grains production jobs	117 grains production jobs
20 grain related jobs	136 grain related jobs	0 grains related jobs
0 processing jobs	136 processing jobs	0 grains processing jobs
4,724 total workforce	7,307 total workforce	616 total workforce
Most Important	Medium Importance	Medium Importance nationally Fairly Important by WA

There is more employment volatility in local grains supply chains than the quantitative data shows. The qualitative portion of this research indicated that in dry seasons, employment is predominately reduced for casual workers, contractors and overseas workers. These are groups which are not included in most quantitative employment measures that instead calculate the workforce as a combination of full time and part time roles. Some of these roles in the grain industry include crop sprayers, fertiliser spreaders, harvest services, machinery operators and general farm services.

This means that the quantitative measures, like the ABS Census, ‘hide’ the real level of employment elasticity between good and poor grain production years. In the same way, it also underestimates the degree which the local industry and community experiences employment contraction during dry years.

The qualitative research indicates that many businesses and growers aim to keep their full time and part time staff during dry seasons. A contributing factor to this decision is that in tight job and skill markets the businesses and growers fear not being able to replace these workers when the seasons are good and the work load increases. Community and social responsibility is another partial explanation for businesses and growers keeping their workers in dry seasons, as the loss of workers can affect broader social and economic factors in the community they live in.

There are examples where businesses prefer to deploy their staff elsewhere in dry seasons, as opposed to ceasing their employment. This is particularly true for contractors which can relocate to other regions where the dry season is not having the same impact. There were also examples of businesses reducing the hours of their employees as an attempt to keep their staff, but reduce financial stress during dry seasons.

In this way, grains businesses try to minimise job losses as a result of seasonal volatility. Measures are taken to redeploy people temporarily or reduce hours, rather than ceasing their employment. These are not captured in the quantitative datasets alone.

The number of grain production jobs increase with raw tonnage and gross value

There is a strong correlation between grain gross value in each region and the number of grain production jobs. The trend is generally an increase in the number of local grain production jobs as the gross value of grain production increases. This is shown in Figure 14 where the regions with a low grain gross value and low number of grain production jobs are in the bottom left, and regions with higher gross values and grain production jobs are in the upper right corner. This trend in Figure 14 also exists for number of grain production jobs against the grain tonnage produced in 2015-16, with most regions plotting similarly across the spectrum. Moree Plains is an example of both a high number of production jobs (737 jobs in 2016) and tonnage and gross value (1,745,000 tonnes and \$793 million in 2015-16).

For the average region there would be 127 grain production jobs, \$52.4 million of gross value and 152,000 tonnes produced in 2015-16. This means there is one grain production job for approximately every 1,000 tonnes of grain produced per council area (1,196 tonnes precisely). The average number of grain production jobs is highest in regions where grain is benchmarked in the more important categories. The average other grain jobs are around hover around 27 jobs for all benchmarked categories, with is the total average for all regions. The average number of grain processing jobs however, is smallest in the regions where grains is benchmarked as more important.

Grains Production Employment vs Gross Value, 2015-16

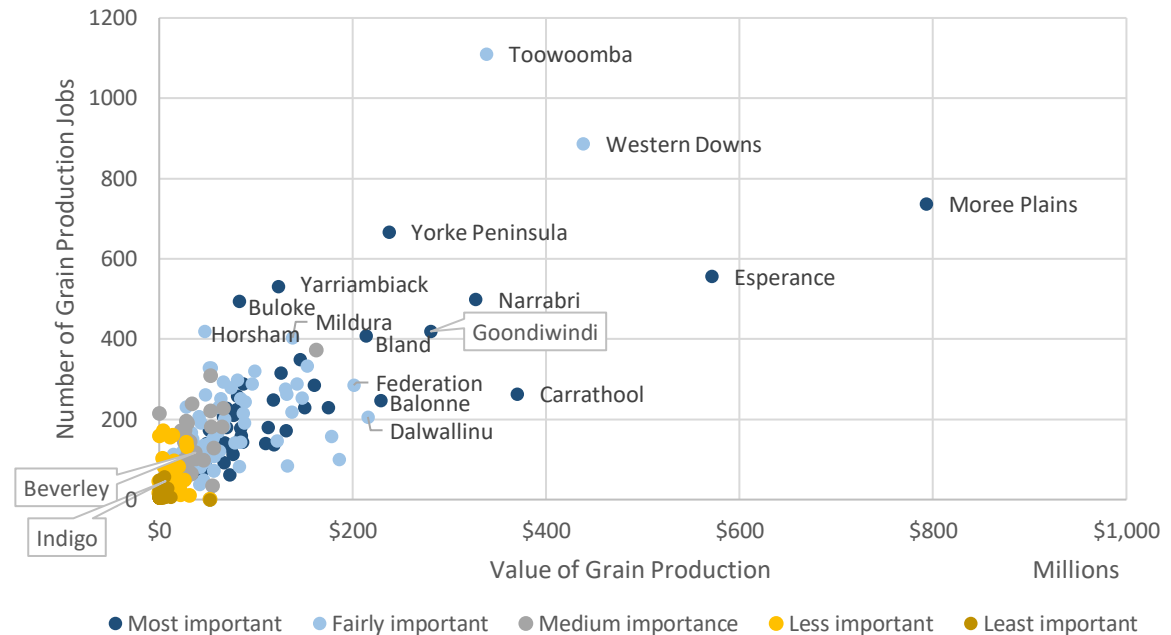


Figure 14: Local Government Areas plotted by the number of grains production jobs and gross value from grains in 2015-16. The colouring shows how each Local Government Area has been benchmarked according to grains importance in the region. Outliers and case study regions are labelled.

Grains Processing Employment vs Gross Value, 2015-16

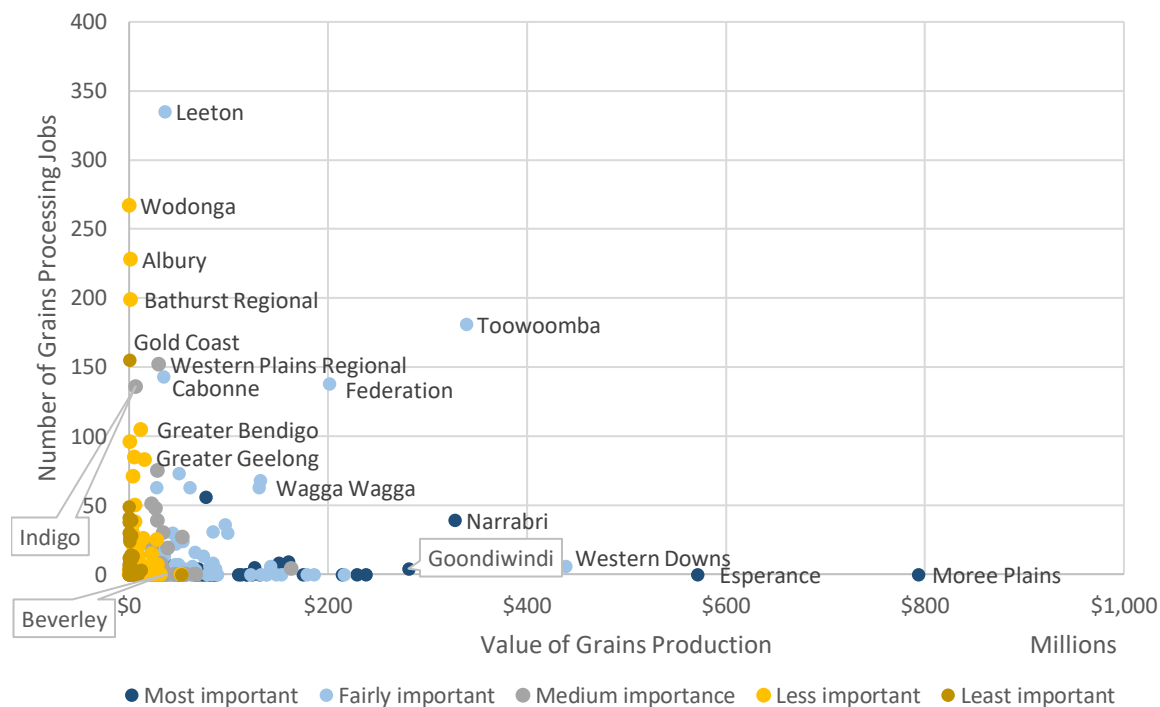


Figure 15: Local Government Areas plotted by the number of other grains related jobs and gross value from grains in 2015-16. The colouring shows how each Local Government Area has been benchmarked according to grains importance in the region. Outliers and case study regions are labelled.

Grains processing is centralising and the largest number of grain processing jobs are in regions with no grain production

Regions with a high number of other grains related jobs, predominately processing jobs, are generally in regions with low or no grains production. This is shown in Figure 15 where there is a higher number of other grains related jobs, shown along the y-axis, and \$0 of grain production in 2015-16, shown along the x-axis. Some of these regions include Wodonga, Albury, Bathurst, Greater Geelong, Bendigo and Cabonne (the council area surrounding Orange). For Wodonga, as an example, there were 267 grain processing jobs but only \$0.06 million of gross value and 170 tonnes of grain produced in the region itself. This indicates that grains are grown elsewhere are transported to these regions where they are value added through grain processing businesses. Regions with high processing and low grain production generally have larger populations and are service hubs for the surrounding regional areas.

This picks up on a trend in the broader agriculture industry where processing jobs, or the value add aspect of the supply chain, are centralising geographically. The centralised regions are, in many cases, not the regions where the raw commodity is produced. The trend shown in Figure 15 also exists for the number of grain processing jobs against the grain tonnage produced in 2015-16. Data shows that the average for this would be 27 other grain related jobs, \$52.4 million gross value and 152,000 tonnes produced 2015-16 per council region.

From an employment perspective, grains production jobs are most important in some of the small regional economies, despite relatively low tonnage and gross values

When we look at the concentration of grain production jobs against the gross value of grain produced, a cluster of small Western Australian towns emerges. This trend appears in the top left corner of Figure 16, at the intersection of low gross value of grains (\$0-1 million) and high concentration of production jobs (over 40 Location Quotient Score). This means that for these places, grains production jobs are very important for local employment while simultaneously the region has smaller gross value derived from grains. This story is similar for the tonnage. For Trayning, as an example, there were 47 times the national average concentration of grains jobs for a place of its size in 2016. This was despite a low tonnage and gross value in 2015-16 (36,000 tonnes and \$10 million).

In examining grains industry employment through a regional development lens, as opposed to an overall national level industry, the level of specialisation is crucial (measured by Location Quotient scores). Some regions can make a large contribution to the grain industry, in terms of scale and gross value, but they may not be particularly specialised in that industry because of high employment in other industries. Alternatively, some regions where the grain industry's contribution appears less significant to national goals, may actually be highly specialised in grains production and thus reliant on the grain industry's success for employment growth.

Grain Production Location Quotient vs Gross Value, 2015-16

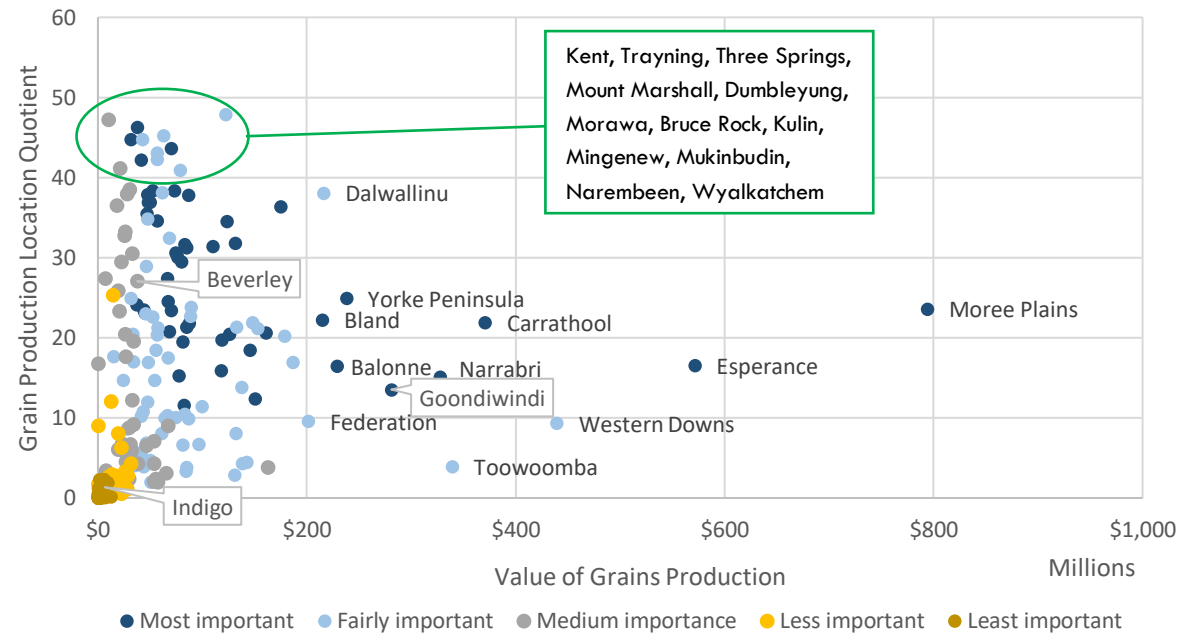


Figure 16: Local Government Areas plotted by the gross value from grains in 2015-16 and the Location Quotient score, or concentration of grains production employment against the national average. The colouring shows how each Local Government Area has been benchmarked according to grains importance in the region. Outliers and case study regions are labelled.

Some of these regions, shown in Figure 16, include Kent, Trayning, Narembeen, Mount Marshall, Mulinbudin, Dumbleyung, Kulin, Wyalkachem, Morawa and Three Springs. These regions are marked by arbitrary council boundaries and play an important part in the broader wheatbelt. The national average for all council areas with grain production jobs is a Location Quotient score of 1, \$52.4 million gross value and 152,000 tonnes produced in 2015-16.

The average number of grain production jobs for council areas with grain production jobs are shown in Figure 17 and 18. For both tonnage and gross value, the Southern Growing Region has a higher number of jobs per 1,000 tonnes and \$1 million of grains produced. The Northern Growing Region is generally in line with the national average and the Western Growing Region is slightly lower on both measures, meaning the Western Growing Region is generally producing more with less workers while the Southern Growing Region supports more workers from less grain production.

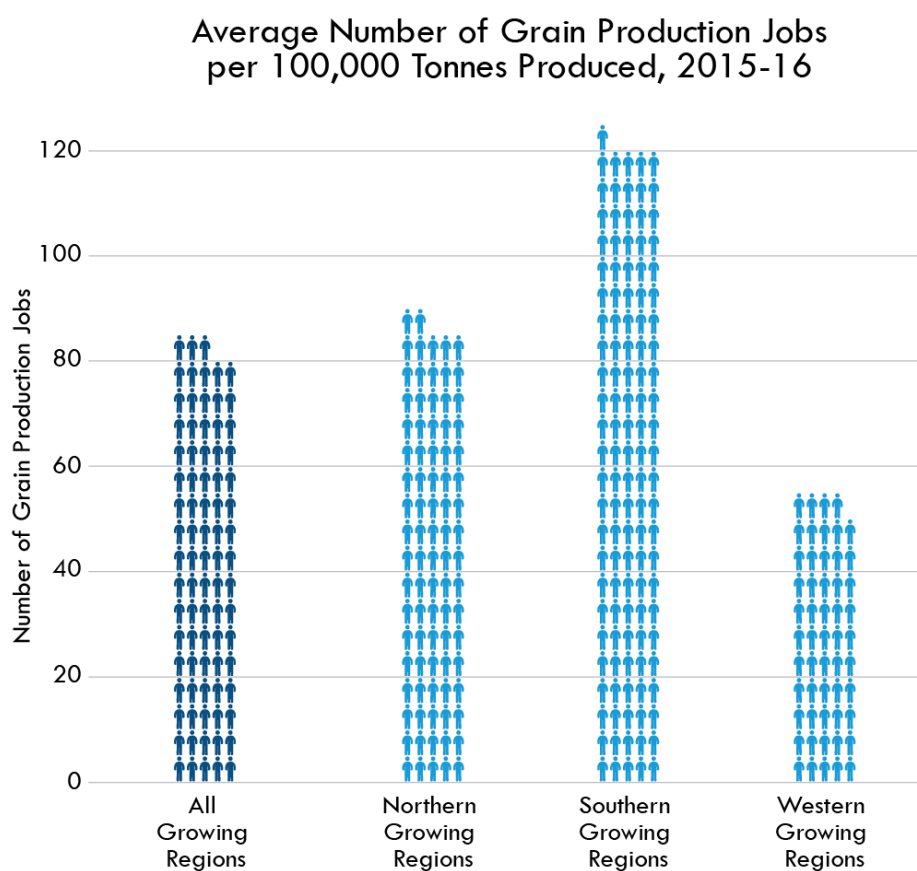


Figure 17: The average number of grain production jobs per 100,000 tonnes of grain produced.

Average Number of Grain Production Jobs per \$10million Grain Gross Value, 2015-16

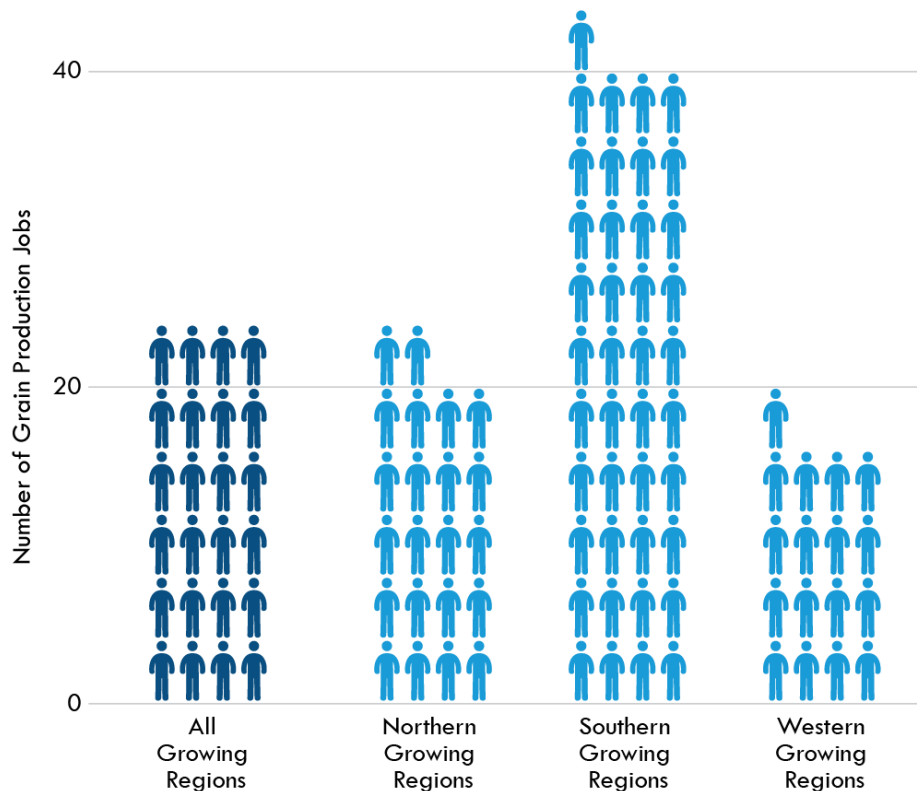


Figure 18: The average number of grain production jobs per \$10 million gross value.

GETTING MORE VALUE FROM GRAIN PRODUCTION

From the data, strong grains processing region looks like Indigo with 2 per cent grains processing jobs and over 100 jobs in predominately a single or few occupations, such as cereal manufacturing and animal feed manufacturing. From interviews in Indigo, it was apparent that these were in predominately in a large single or handful of businesses, which matches with findings from the RAI's Regional Growth Prospects report^{xxiv} which shows single or few manufacturing businesses responsible for the majority of employment in that industry. Another regions which look similar to Indigo from the data is Western Plains Regions (grain processing accounts for 152 jobs which is 3 per cent of the region's workforce). Other similar regions are Wodonga, Albury, Bathurst, Greater Geelong and Greater Bendigo albeit these are larger populations and the grains industry is therefore benchmarked as lower importance because they have greater industry diversity.

Increases in grain processing employment in some regions does not necessarily mean growth in those occupations overall. There is a finite number of businesses and people who can perform grain processing functions so an increase in one region of 100 jobs, may mean other regions lose jobs. For example, every region cannot have 100 new grain processing jobs each, and instead some regions will have a distinct strength which they can build on. This strength may be in its positioning for transport routes and logistics, or in its ability to attract and retain the necessary workforce to fill jobs through the region's local livability.

CONCLUSION

There were 34,745 direct grain production jobs across Australia in 2016. This is a significant decline from 2006 where there were 50,707 jobs. This has occurred alongside employment declines in the broader agriculture production sector, partly due to improved technology and efficiencies that lead to a reduced need for human labour.

In 2016, the greatest number of direct grain production jobs were in New South Wales and Western Australia. At the regional scale Toowoomba, Western Downs, Moree Plains, Yorke Peninsula and Esperance had the highest number of direct grain production jobs.

For regional economies, the proportion of local jobs grains contributes is important, not just the raw number of jobs. Regions with a higher proportion of grains production jobs compared to the national average are specialised regions. This is where grains production is a more important source of employment than in other regions and where the region is more dependent on the success of the grains industry for economic outcomes.

Specialised regions have a strong geographic concentration in the Western Australian wheatbelt and southern region, around the Yorke and Eyre Peninsulas, surrounding the Grampians region, through central New South Wales and into inland south west Queensland. The LGAs with the greatest specialisation are all in the Western Growing Region and include Kent, Mount Marshall, Kulin, Dumbleyung and Narembeen. These regions have continued to have a strong specialisation score in 2006, 2011 and 2016 which is likely to continue. This means that grains are likely to continue to be a valuable source of employment in the future.

Grain volume and gross value roughly align in terms of geographic concentration across regional Australia. Moree Plains, Esperance, Western Downs and Carathool topped the LGAs in terms of both volume and gross value of grains production for 2015-16. There was some variation, however in the employment measures.

Across regional Australia there is great variation of the significance of grain production in each local economy. This is true within the three Growing Regions as well with a high level of variation being seen between LGAs.

Three case studies were conducted to build a better understanding of what this looked like on the ground and further explore the flow on employment and business activity which results from grains production in the region. A case study region was selected from each of the three Growing Regions, in different benchmarking categories. The case study regions were Goondiwindi in the Northern Region, Indigo in the Southern Region and Beverley in the Western Region.

Goondiwindi is a council area with diverse range of cropping, including irrigated and non-irrigated crops. It employs people in both grains production (419 jobs) and the value add aspect of the local supply chain (54 jobs). Qualitative research in the region revealed that the local grains industry interacts globally for outputs and market outputs. It also showed that the local grains industry has a

tight workforce, where it is difficult to source the required number of people and skills to fill job needs. The agricultural workforce has a degree of elasticity, with particularly casual, contract and overseas workers contracting during dry seasons. Benchmarking as part of this research shows that the grains industry is of Most Importance in the Goondiwindi Shire.

Indigo Shire showed a different picture, where employment in the local grain industry was much more tied to the value add aspects of the supply chain. While there were only 46 direct grain production jobs, there were 136 in value add occupations such as animal feed and cereal manufacturing. The climate and topography of the region, mean that a wide variety of agricultural commodities can be grown in the region – including grains, horticulture, dairy and meat livestock.

Beverley Shire has a grains industry which is a strong raw production economy. Local grain industry employment is 117 grain and mixed enterprise production jobs, however the workforce swells during the twin workforce peaks around harvest and seeding. During and outside of these peak periods, there is a tight labour and skills market which is compounded by a degree of competition with the mining industry for staff. Beverley's grains industry and employment spreads over a larger geography than the council areas alone, as a result of the generally small sizes of Western Australian wheatbelt towns which means people need to move between towns to procure goods and services that support the grains industry.

The value of grains in communities looks different in different regions and this research points out some of the reasons for this. The mix of grain related jobs varies across regions. Some regions have a high concentration of grains processing jobs, such as Cabonne and Federation, which can often be related a single or few major businesses while other regions have a high proportion of grain production jobs amongst the relatively few other employing industries, such as Kent and Mukinbudin.

From the data in this report, the number of grain production jobs increases with raw tonnage and gross value produced by a region. However raw job numbers are not the only important aspect to grains impact on regional development. There are regions where grains production jobs are few, in relative terms, but they represent a large proportion of local employment. This also occurs in regions where there is a low volume and gross value of grains produced compared to other parts of the country. This does not diminish the importance of the grain's industry, and the jobs it provides, to the local economy.

There are distinct grain production and grain processing regions, with a very small number of regions being strong in both. In the grains industry, as well as other agricultural commodities, there is a centralising of processing jobs. However these processing jobs are not centralizing where grains are grown, instead the largest numbers of grain processing jobs are in region with low or no grains production.

There are many other grain related jobs which are not captured fully in any national datasets. Some of these include local grains industry contributes to such as casual, contractor and overseas workers explicitly working in the grain industry. There are also other sectors which contribute to the grain industry, before the production and the rest of the supply chain which are not captured in the national dataset. This includes grains employment in the research, development and extension sector.

KEY MESSAGES

- *The value of grains in communities looks different in different regions and this research points out some of the reasons for this.*
- *In some regions, the local grains workforce is tight and employers are facing difficulties sourcing labour and skills.*
- *Some regions have labour and skills gaps in particular occupations which are also used in the mining industry which potentially indicates competition for labour between the two industries. The degree which this occurs varies greatly between regions.*
- *The grain workforce has a degree of elasticity, with workforces growing and shrinking in the wet and dry years. This is particularly seen in casual, contract and overseas workers, with employers aiming to keep full time employees during dry seasons because it could be difficult to fill those positions again in the good seasons.*
- *There are distinct grain production and distinct grain processing regions. Grains processing is centralising, meaning now the largest number of grain processing jobs are in regions with low or no grain production.*
- *For regional economies, the proportion of local jobs grains contributes is important, not just the raw number of jobs. From an employment perspective, grains production jobs are generally most important in small regional economies, where there are limited other industries providing employment, this is despite relatively low grains tonnage and gross value in those areas.*
- *In regions which have maintained their grains specialisations over time, grains are likely to continue to be a valuable source of employment in the future.*

APPENDIX A – METHODS

This analysis uses data from the Australian Bureau of Statistics Census of Population and Housing for 2006, 2011 and 2016. Grain production occupations have been selected from the Australian New Zealand Standard Industrial Classification Codes (ANZSIC) at the 4 digit level. The occupations selected in grain production were Grain-Sheep or Grain-Beef Cattle Farming, Other Grain Growing, Cotton Growing and Rice Growing. Similar methods were used to gather data for grain milling, cereal, pasta and baking manufacturing, prepared animal and bird feed manufacturing, oil and fat manufacturing, grain storage services and cereal grain wholesaling occupations. Transport and packaging services data was also collected, however, this was used with digression because not all employment in these occupations is related to grains or agriculture.

The research uses Location Quotients to determine how specialised each Local Government Area is in the grain production. Location Quotients are a quantitative measure of the specialisation of a region's employment in a given industry, against the national average for employment in that industry. Scores are generated to demonstrate the magnitude of the industry's importance in the local economy. Regions with a high location quotient score (i.e.: a high specialisation score) in grain production are more dependent on the success of the industry for economic outcomes. Conversely, areas with a low specialisation score typically have greater diversity amongst their industries or have a different dominant industry, such as mining, construction or services. Regions which score over 1 are above the national average and regions scoring above 3 have a very strong specialisation. Natural breaks have been used to determine top ranking specialised places.

Volume and value data was extracted from the 2015-16 ABS Agricultural Census, particularly the data from the Agricultural Commodities. Broad acre cropping and cotton were selected as parts of the grains industry which includes wheat, oats, barley, triticale, sorghum, maize, canola, other oilseeds, lupins, lentils, chickpeas, fava beans, peanuts, other pulses, mung beans, rice and cotton. Some conversions were done to ensure all commodities were analysed in tonnes.

To benchmark the importance of the grains industry in regional economies, employment and value measures were calculated for each regional LGA that had grain production employment in 2016. The scores for each criteria were split into quintile ranges to determine LGAs which were in the top, middle and bottom quintiles for that measure. Scores were attributed to each quintile. Grains mass was weighted at 0.5 and specialisation change was weighted 0. From this data, LGAs were benchmarked into categories to show the importance of the grains industry in the local economy. These categories were: most important, fairly important, medium importance, less important and least importance.

Three case study regions were selected from each of the Growing Regions: Northern, Southern and Western. The regions were chosen considering their benchmarking scores, natural of grain employment and diversity across grains crops produced, among other factors. In each region, semi-structured interviews were conducted based on a set of pre-prepared questions. The line of questioning was adjusted to suit the individual that was being interviewed, and their role in the community or local grains supply chain. For example, questions about grain inputs were asked of growers and not local leaders without a farming occupation. Local knowledge and information gleaned from the interviews were distilled into key themes for each region and, in some instances, were compared with quantitative data sources.

ATTACHMENT B – BENCHMARKING GRAINS IMPORTANCE IN REGIONAL ECONOMIES

Benchmarking the importance of the grains industry to the local economy used the following indicators and ranges. Where deep green indicates the top performers.

Indicator	Grains Production Employment Share (%)	Grains Production Jobs LQ	Grains Production Change in Specialisation LQ	Other Grains Related Jobs LQ	Grains Value (\$million)	Grains Mass (tonnes)
Top Quintile	18.86% - 54.85%	57.02 – 165.83	+8.58 – +57.60	3.10 – 27.11	\$77 - \$793	235,618 – 1,784,003
Second Quintile	6.21% - 18.86%	18.76 – 57.02	+2.30 – +8.58	3.10 – 1.61	\$41 - \$77	125,219 – 235,618
Third Quintile	1.37% - 6.21%	4.14 – 18.76	+0.40 – +2.30	0.44 – 1.61	\$16 - \$41	53,643 – 125,219
Fourth Quintile	0.23% - 1.37%	0.71 – 4.14	+0.01 – +0.40	0.00 – 0.44	\$2 - \$16	5,858 – 53,643
Fifth Quintile	0% - 0.23%	0.01 – 0.71	-32.63 – +0.01	0.00 – 0.00	\$0 - \$2	0 – 5,858

NORTHERN GROWING REGION

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Armidale Regional	Less important	0.2%	21	0.52	15	0.89	\$22,572,551	48,705
Balonne	Most important	12.0%	248	36.19	3	0.47	\$228,785,522	401,171
Balranald	Less important	5.6%	51	16.85	0	0.00	\$19,117,906	69,855
Banana	Medium importance	2.6%	181	7.81	6	0.24	\$65,014,616	109,296
Bathurst Regional	Less important	0.1%	23	0.39	199	6.85	\$1,194,388	3,823
Berrigan	Less important	5.1%	159	15.56	14	1.86	\$180,164	560
Bland	Most important	16.8%	409	50.82	15	1.92	\$214,174,661	704,025
Blayney	Medium importance	0.5%	14	1.37	31	4.31	\$2,779,758	9,669
Bogan	Fairly important	7.7%	83	23.32	3	0.89	\$82,899,405	204,367
Brewarrina	Less important	2.2%	10	6.62	0	0.00	\$31,571,384	55,438

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Bundaberg	Least important	0.0%	8	0.07	0	0.00	\$6,570,473	6,855
Burdekin	Less important	0.1%	10	0.39	22	0.97	\$8,992,350	15,559
Cabonne	Fairly important	2.6%	151	7.81	143	9.51	\$34,313,950	109,641
Cairns	Least important	0.0%	5	0.02	0	0.00	\$254,198	310
Carrathool	Most important	20.1%	264	60.83	7	1.36	\$370,385,445	820,910
Central Coast	Poor	0.0%	6	0.01	511	2.66	\$0	0
Central Darling	Least important	1.0%	5	3.06	0	0.00	\$3,936,596	7,369
Central Highlands	Medium importance	2.8%	373	8.55	21	0.50	\$162,830,144	274,836
Charters Towers	Least important	0.1%	5	0.34	10	1.02	\$115,600	410
Clarence Valley	Less important	0.0%	7	0.12	50	1.88	\$5,546,214	14,034
Cobar	Less important	2.1%	41	6.43	0	0.00	\$12,417,863	40,819
Coolamon	Most important	14.4%	228	43.57	23	5.56	\$69,504,494	221,283
Coonamble	Most important	13.6%	179	41.12	11	3.08	\$84,333,804	234,543
Cowra	Medium importance	3.1%	145	9.47	18	1.72	\$32,098,333	99,423
Edward River	Fairly important	4.6%	169	13.85	67	7.55	\$60,855,601	194,694
Federation	Fairly important	6.0%	285	18.01	155	12.22	\$201,055,706	638,899
Forbes	Fairly important	5.6%	215	17.05	17	1.84	\$86,479,944	281,032
Fraser Coast	Least important	0.0%	8	0.08	3	0.07	\$505,226	875
Gilgandra	Fairly important	10.9%	184	32.96	10	2.23	\$66,608,197	213,868
Gladstone	Least important	0.0%	6	0.07	18	0.29	\$139,238	494
Glen Innes Severn	Least important	0.7%	20	1.98	0	0.00	\$1,985,028	4,480
Gold Coast	Least important	0.0%	25	0.03	167	0.50	\$140,399	189
Goondiwindi	Most important	8.9%	419	26.82	24	1.82	\$280,777,201	644,738
Goulburn Mulwaree	Least important	0.1%	13	0.31	0	0.00	\$780,408	2,339
Greater Hume Shire	Fairly important	6.3%	279	18.94	19	1.61	\$74,208,063	230,895

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Griffith	Medium importance	2.7%	308	8.16	32	1.06	\$53,533,461	129,400
Gundagai	Medium importance	2.4%	102	7.23	28	2.75	\$38,362,087	114,517
Gunnedah	Fairly important	5.1%	264	15.33	73	5.24	\$131,513,054	289,943
Gwydir	Fairly important	11.2%	218	33.76	5	0.75	\$137,288,245	349,213
Gympie	Least important	0.1%	11	0.19	3	0.08	\$573,966	1,637
Hay	Fairly important	3.2%	39	9.80	6	1.87	\$41,678,800	54,553
Hilltops	Fairly important	3.9%	289	11.93	48	2.61	\$96,212,932	285,465
Inverell	Fairly important	2.1%	131	6.29	36	2.52	\$43,706,567	107,865
Isaac	Medium importance	1.9%	181	5.60	3	0.08	\$53,840,642	163,224
Junee	Most important	6.6%	146	20.00	17	3.18	\$82,172,496	249,820
Kyogle	Least important	0.5%	16	1.57	0	0.00	\$2,312,290	4,950
Lachlan	Fairly important	14.2%	333	43.01	10	1.49	\$152,806,177	507,759
Leeton	Fairly important	2.7%	124	8.25	350	27.11	\$35,534,834	80,389
Lithgow	Least important	0.1%	5	0.20	0	0.00	\$121,293	310
Liverpool Plains	Most important	8.0%	229	24.11	29	3.70	\$150,209,590	392,052
Livingstone	Least important	0.0%	7	0.14	0	0.00	\$1,194,013	2,693
Lockhart	Most important	19.1%	225	57.65	9	2.77	\$79,886,304	254,561
Lockyer Valley	Less important	1.1%	171	3.34	22	0.64	\$4,573,525	14,305
Mackay	Least important	0.0%	5	0.03	16	0.14	\$2,503,928	2,974
Maranoa	Fairly important	2.3%	143	6.94	16	1.00	\$84,306,558	220,651
Mid-Coast	Least important	0.0%	6	0.06	14	0.29	\$1,850,506	5,843
Mid-Western Regional	Less important	0.3%	33	1.05	5	0.21	\$6,556,580	22,167
Moree Plains	Most important	13.8%	737	41.63	42	3.16	\$793,422,036	1,745,846
Murray River	Fairly important	6.1%	294	18.49	21	1.74	\$66,283,186	215,088
Murrumbidgee	Most important	17.6%	285	53.19	18	3.06	\$160,272,649	419,606

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Nambucca	Least important	0.1%	6	0.30	0	0.00	\$0	0
Narrabri	Most important	9.1%	500	27.53	94	6.69	\$327,156,425	604,757
Narrandera	Most important	9.5%	210	28.75	73	12.45	\$77,038,248	250,878
Narromine	Most important	12.9%	316	38.88	18	2.74	\$125,744,972	310,427
Newcastle	Least important	0.0%	11	0.05	71	0.84	\$0	0
North Burnett	Less important	1.2%	50	3.61	4	0.29	\$4,005,367	9,116
Orange	Less important	0.1%	26	0.45	96	3.68	\$649,534	2,081
Parkes	Fairly important	5.6%	320	16.90	55	4.61	\$99,011,158	323,742
Port Macquarie-Hastings	Least important	0.0%	5	0.05	3	0.07	\$1,158,425	3,009
Richmond Valley	Less important	0.1%	9	0.34	23	1.34	\$4,537,744	7,576
Rockhampton	Least important	0.1%	17	0.15	19	0.35	\$990,178	2,450
Scenic Rim	Least important	0.2%	33	0.60	13	0.39	\$3,465,707	8,611
Snowy Monaro Regional	Least important	0.2%	15	0.47	0	0.00	\$4,429,115	13,171
Snowy Valleys	Least important	0.1%	7	0.36	0	0.00	\$1,845,926	5,863
Somerset	Less important	0.4%	34	1.13	4	0.19	\$1,924,819	5,850
South Burnett	Medium importance	1.3%	152	4.04	46	1.69	\$28,262,826	56,024
Southern Downs	Medium importance	1.2%	161	3.52	54	1.77	\$22,425,149	67,420
Sunshine Coast	Least important	0.0%	31	0.07	39	0.21	\$2,135,124	5,222
Tablelands	Less important	0.2%	20	0.64	21	1.08	\$4,202,507	9,204
Tamworth Regional	Less important	0.4%	97	1.15	88	2.04	\$15,582,071	53,462
Temora	Most important	12.2%	289	36.79	31	5.50	\$87,089,653	276,502
Tenterfield	Least important	0.8%	17	2.29	0	0.00	\$1,448,933	3,326
Toowoomba	Fairly important	1.6%	1111	4.77	285	2.35	\$338,611,000	735,698
Townsville	Least important	0.0%	5	0.02	30	0.29	\$0	0
Upper Hunter Shire	Least important	0.4%	24	1.18	0	0.00	\$5,775,684	17,733

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Upper Lachlan Shire	Least important	0.2%	8	0.71	0	0.00	\$3,087,603	9,189
Wagga Wagga	Fairly important	0.9%	276	2.83	101	2.45	\$130,534,532	416,012
Walcha	Least important	0.5%	6	1.36	0	0.00	\$419,079	1,507
Walgett	Fairly important	13.0%	253	39.33	0	0.00	\$147,691,199	230,349
Warren	Fairly important	17.7%	192	53.60	0	0.00	\$87,869,352	225,123
Warrumbungle Shire	Fairly important	4.2%	135	12.79	14	1.67	\$45,947,307	134,307
Weddin	Fairly important	18.5%	244	55.88	0	0.00	\$88,862,993	282,817
Wentworth	Less important	1.9%	49	5.60	0	0.00	\$26,166,036	93,951
Western Downs	Fairly important	6.3%	887	18.90	47	1.17	\$438,554,877	971,619
Western Plains Regional	Medium importance	0.9%	190	2.63	187	5.57	\$29,650,768	96,372
Whitsunday	Least important	0.3%	50	0.98	0	0.00	\$221,438	99
Wollongong	Least important	0.0%	13	0.05	56	0.52	\$0	0
Yass Valley	Least important	0.2%	18	0.69	0	0.00	\$5,819,919	17,298

SOUTHERN GROWING REGION

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Albury	Less important	0.1%	31	0.42	232	7.15	\$1,288,697	4,000
Alexandrina	Less important	0.6%	57	1.74	21	1.07	\$9,593,450	35,535
Ararat	Medium importance	4.9%	227	14.91	4	0.37	\$66,746,503	202,439
Ballarat	Less important	0.2%	103	0.70	82	1.34	\$3,842,226	11,765

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Barossa	Less important	0.3%	30	0.82	30	1.09	\$3,390,441	12,072
Barunga West	Fairly important	24.1%	201	72.95	0	0.00	\$67,743,169	222,467
Benalla	Less important	1.3%	71	3.90	6	0.54	\$15,996,715	48,847
Berri and Barmera	Less important	0.3%	13	0.94	5	0.54	\$733,897	2,888
Brighton	Least important	0.1%	5	0.23	6	0.60	\$148,419	531
Buloke	Most important	20.8%	495	63.01	39	5.86	\$82,807,745	272,636
Burnie	Least important	0.1%	6	0.24	6	0.50	\$741,256	1,139
Campaspe	Medium importance	1.3%	195	3.80	85	2.22	\$28,467,017	91,167
Ceduna	Fairly important	8.0%	114	24.14	20	7.29	\$14,881,677	58,557
Central Goldfields	Medium importance	1.7%	70	5.02	15	1.74	\$7,526,863	24,104
Clare and Gilbert Valleys	Fairly important	6.2%	252	18.83	21	1.95	\$63,557,509	221,991
Clarence	Least important	0.0%	6	0.07	24	0.84	\$103,469	144
Cleve	Fairly important	29.3%	232	88.67	0	0.00	\$61,350,169	242,222
Colac-Otway	Less important	0.3%	30	0.98	15	0.67	\$6,415,883	20,027
Copper Coast	Fairly important	4.3%	207	12.89	53	6.14	\$41,061,349	123,060
Corangamite	Fairly important	1.5%	105	4.56	76	3.44	\$50,199,908	161,102
Devonport	Least important	0.1%	5	0.16	0	0.00	\$338,061	361
East Gippsland	Least important	0.1%	10	0.18	6	0.19	\$1,904,532	6,429
Elliston	Most important	29.0%	129	87.64	5	2.79	\$74,145,640	289,611
Flinders Ranges	Least important	1.0%	6	3.01	0	0.00	\$926,698	3,610
Franklin Harbour	Medium importance	14.5%	64	43.88	0	0.00	\$33,683,887	132,990
Gannawarra	Medium importance	4.0%	171	12.11	23	1.89	\$22,604,560	74,351
Golden Plains	Less important	1.3%	132	4.03	28	1.39	\$28,656,315	89,697
Goyder	Medium importance	13.7%	215	41.51	6	1.10	\$448,625	1,500
Grant	Least important	0.6%	21	1.69	0	0.00	\$1,623,902	5,478

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Greater Bendigo	Less important	0.3%	155	0.97	132	1.69	\$11,410,665	37,150
Greater Geelong	Less important	0.1%	82	0.24	166	1.15	\$5,117,616	15,030
Greater Shepparton	Less important	0.5%	142	1.62	46	0.85	\$27,948,076	83,686
Hepburn	Less important	0.4%	27	1.33	10	0.98	\$6,473,497	19,270
Hindmarsh	Fairly important	14.8%	329	44.78	18	2.91	\$51,873,459	168,541
Horsham	Fairly important	4.7%	420	14.32	59	3.95	\$46,868,690	143,492
Indigo	Medium importance	0.6%	46	1.90	136	9.26	\$6,608,017	21,064
Kangaroo Island	Less important	1.4%	30	4.34	0	0.00	\$9,930,672	30,550
Karoonda East Murray	Medium importance	34.1%	142	102.95	0	0.00	\$26,095,118	104,141
Kentish	Least important	0.3%	7	0.90	0	0.00	\$823,797	556
Kimba	Most important	35.5%	174	107.36	5	2.59	\$51,992,176	205,268
Kingston	Least important	0.9%	9	2.84	28	0.28	\$2,261,626	7,320
Latrobe	Less important	0.4%	17	1.18	3	0.05	\$1,971,764	2,128
Launceston	Least important	0.1%	15	0.17	26	0.76	\$260,048	843
Light	Fairly important	2.4%	173	7.29	51	3.14	\$26,670,225	99,865
Loddon	Fairly important	12.1%	328	36.46	27	2.85	\$53,611,039	175,294
Lower Eyre Peninsula	Most important	10.3%	249	31.21	21	3.16	\$117,774,736	408,151
Loxton Waikerie	Medium importance	4.6%	221	13.84	6	0.45	\$53,252,260	211,656
Mallala	Medium importance	2.4%	96	7.37	16	1.69	\$29,606,892	97,336
Meander Valley	Less important	0.2%	20	0.74	7	0.43	\$5,904,523	6,732
Mid Murray	Medium importance	4.1%	129	12.52	8	0.97	\$30,741,604	124,606
Mildura	Fairly important	1.8%	403	5.52	19	0.48	\$138,079,784	483,056
Moira	Fairly important	2.2%	252	6.59	66	2.10	\$83,875,883	259,410
Moorabool	Less important	0.3%	43	0.91	20	0.78	\$10,711,872	27,349

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Mount Alexander	Less important	0.3%	23	0.94	5	0.39	\$2,134,900	6,595
Mount Remarkable	Medium importance	14.7%	170	44.31	0	0.00	\$25,721,734	100,057
Moyne	Less important	0.9%	69	2.77	5	0.23	\$16,479,901	51,155
Murray Bridge	Less important	0.8%	70	2.56	40	2.30	\$14,130,766	58,988
Naracoorte and Lucindale	Less important	2.2%	90	6.63	0	0.00	\$13,143,330	43,254
Northern Areas	Most important	13.6%	258	41.16	24	4.26	\$80,648,103	312,924
Northern Grampians	Medium importance	5.0%	239	15.24	33	2.98	\$33,875,970	108,751
Northern Midlands	Less important	0.8%	43	2.46	9	0.75	\$21,344,240	42,663
Orroroo/Carrieton	Medium importance	14.2%	52	43.07	0	0.00	\$26,637,041	103,594
Peterborough	Less important	2.8%	12	8.54	0	0.00	\$22,384,202	87,078
Port Lincoln	Less important	0.7%	45	2.25	50	4.46	\$22,896	78
Port Pirie City and Dists	Fairly important	2.2%	138	6.54	28	2.24	\$49,508,733	185,708
Pyrenees	Medium importance	3.9%	98	11.79	11	1.66	\$25,758,761	80,279
Renmark Paringa	Least important	0.2%	8	0.62	0	0.00	\$4,278,739	17,112
Southern Grampians	Less important	1.2%	82	3.49	4	0.25	\$20,103,475	60,809
Southern Mallee	Fairly important	18.8%	168	56.75	3	0.86	\$33,206,760	132,271
Southern Midlands	Less important	0.6%	15	1.87	4	0.66	\$3,785,038	7,655
Strathbogie	Least important	1.4%	57	4.09	0	0.00	\$5,241,122	16,793
Streaky Bay	Less important	18.1%	160	54.60	0	0.00	\$14,547,516	57,442
Surf Coast	Less important	0.3%	47	1.03	21	1.01	\$9,275,520	29,870
Swan Hill	Fairly important	3.6%	298	10.90	31	1.62	\$80,929,692	268,023

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Tatiara	Fairly important	7.0%	231	21.16	80	7.04	\$27,590,927	92,312
The Coorong	Fairly important	8.7%	192	26.33	11	1.45	\$42,809,574	153,872
Tumby Bay	Most important	20.7%	208	62.45	20	6.19	\$66,323,792	230,563
Unincorporated SA	Medium importance	2.2%	34	6.59	0	0.00	\$55,666,475	217,488
Wakefield	Most important	13.2%	350	39.88	34	4.22	\$145,443,918	480,381
Wangaratta	Less important	0.3%	42	1.03	38	1.69	\$5,998,748	18,783
Warrnambool	Least important	0.0%	5	0.10	10	0.43	\$140,437	525
Wattle Range	Less important	1.1%	54	3.33	8	0.52	\$14,373,361	45,650
Wellington	Least important	0.1%	14	0.24	13	0.32	\$3,570,131	11,256
West Wimmera	Fairly important	14.6%	261	44.01	5	0.76	\$47,661,396	152,776
Whyalla	Least important	0.1%	6	0.22	3	0.16	\$12,157,044	47,998
Wodonga	Less important	0.1%	17	0.29	267	10.04	\$56,217	174
Wudinna	Most important	27.6%	167	83.31	6	2.92	\$56,076,732	219,133
Yarriambiack	Most important	21.1%	531	63.93	52	7.94	\$123,080,399	369,189
Yorke Peninsula	Most important	17.0%	667	51.48	38	3.34	\$237,592,544	696,849

WESTERN GROWING REGION

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Albany	Medium importance	0.8%	128	2.47	86	3.11	\$56,960,727	168,741
Beverley	Medium importance	19.0%	117	57.42	0	0.00	\$37,453,573	120,331
Boddington	Less important	1.9%	16	5.84	0	0.00	\$2,958,856	9,072
Boyup Brook	Less important	11.4%	77	34.59	0	0.00	\$12,369,531	39,448

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Bridgetown-Greenbushes	Least important	0.4%	7	1.15	0	0.00	\$5,856,400	18,677
Brookton	Medium importance	26.1%	90	78.87	0	0.00	\$27,758,177	90,904
Broomehill-Tambellup	Most important	33.7%	140	101.99	3	1.86	\$49,311,173	149,078
Bruce Rock	Fairly important	32.6%	114	98.47	0	0.00	\$56,185,378	188,378
Busselton	Least important	0.2%	33	0.63	10	0.31	\$830,713	2,846
Capel	Least important	0.1%	9	0.35	5	0.29	\$358,101	1,194
Carnamah	Fairly important	21.4%	50	64.60	0	0.00	\$45,807,182	146,260
Chapman Valley	Fairly important	14.0%	74	42.21	3	1.94	\$56,158,366	175,331
Chittering	Least important	1.2%	29	3.60	0	0.00	\$8,882,024	27,751
Coorow	Most important	23.9%	93	72.28	6	3.72	\$66,879,164	213,546
Corrigin	Most important	28.8%	133	87.03	13	8.15	\$46,464,849	152,166
Cranbrook	Fairly important	22.8%	109	68.94	0	0.00	\$56,942,236	172,148
Cuballing	Medium importance	19.1%	58	57.87	0	0.00	\$19,149,593	59,630
Cunderdin	Most important	18.4%	103	55.71	11	5.91	\$43,256,259	141,885
Dalwallinu	Fairly important	32.3%	206	97.77	0	0.00	\$215,732,670	701,964
Dandaragan	Medium importance	6.6%	89	19.87	0	0.00	\$29,757,989	93,885
Denmark	Least important	0.3%	6	0.81	0	0.00	\$0	0
Donnybrook-Balingup	Least important	0.2%	5	0.64	0	0.00	\$270,971	689
Dowerin	Most important	33.7%	96	101.84	3	2.71	\$47,812,843	156,050
Dumbleyung	Most important	43.6%	127	131.94	3	2.57	\$37,379,230	125,373
Esperance	Most important	8.8%	556	26.74	75	5.25	\$571,196,366	1,784,003
Exmouth	Least important	0.4%	5	1.15	0	0.00	\$0	0
Gnowangerup	Most important	29.4%	159	89.02	12	5.54	\$84,565,540	271,755
Goomalling	Most important	28.5%	115	86.06	3	2.32	\$47,103,100	153,734

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Greater Geraldton	Fairly important	1.8%	289	5.31	76	2.78	\$142,068,364	443,763
Harvey	Least important	0.1%	14	0.37	4	0.13	\$3,788	14
Irwin	Medium importance	4.4%	58	13.44	4	1.09	\$22,604,921	69,529
Jerramungup	Most important	33.1%	172	100.00	13	5.65	\$131,313,839	420,750
Katanning	Fairly important	6.9%	120	20.91	22	6.35	\$24,029,625	73,153
Kellerberrin	Most important	15.4%	72	46.61	6	4.52	\$44,484,040	145,912
Kent	Fairly important	54.9%	147	165.83	0	0.00	\$121,960,415	391,925
Kojonup	Fairly important	16.9%	153	50.94	4	1.13	\$55,376,198	167,414
Kondinin	Most important	31.0%	141	93.69	5	2.62	\$109,688,205	367,901
Koorda	Most important	38.8%	62	117.15	13	18.92	\$72,686,391	237,232
Kulin	Most important	47.1%	181	142.50	6	3.40	\$69,477,989	233,034
Lake Grace	Most important	35.2%	229	106.35	13	4.85	\$174,883,236	586,571
Mandurah	Least important	0.1%	23	0.23	32	0.49	\$0	0
Merredin	Most important	10.1%	142	30.47	37	12.73	\$67,910,550	227,691
Mingenew	Most important	40.8%	78	123.46	6	8.09	\$30,884,569	98,615
Moora	Most important	17.7%	181	53.39	8	2.83	\$112,404,153	365,747
Morawa	Fairly important	26.6%	71	80.39	0	0.00	\$56,027,908	178,898
Mount Marshall	Fairly important	51.9%	122	156.95	0	0.00	\$62,269,219	213,733
Mukinbudin	Medium importance	36.2%	83	109.58	0	0.00	\$20,982,143	72,019
Murray	Least important	0.1%	8	0.38	9	0.55	\$1,308,127	4,011
Narembeen	Fairly important	41.4%	142	125.16	0	0.00	\$78,472,875	263,104
Narrogin	Medium importance	5.6%	111	16.92	10	2.59	\$32,709,752	103,642
Northam	Fairly important	2.6%	111	7.97	28	3.42	\$34,919,414	108,480
Northampton	Fairly important	12.2%	158	36.89	4	1.21	\$178,343,623	556,571
Nungarin	Medium importance	27.7%	23	83.78	0	0.00	\$7,136,347	24,495
Perenjori	Fairly important	24.8%	85	74.92	0	0.00	\$132,479,221	423,008

Local Government Area	Benchmarking	Grain Production Jobs (%)	Grain Production Jobs (no.)	Grain Production LQ Score	Other Grain Jobs (no.)	Other Grain Jobs LQ Score	Grain Gross Value (\$)	Grain Mass (tonnage)
Pingelly	Medium importance	22.9%	88	69.10	0	0.00	\$22,429,982	73,455
Plantagenet	Medium importance	4.8%	98	14.48	0	0.00	\$46,026,646	129,743
Quairading	Fairly important	28.4%	94	85.86	0	0.00	\$46,844,152	153,653
Ravensthorpe	Most important	19.6%	137	59.34	3	1.02	\$118,445,513	368,755
Serpentine-Jarrahdale	Least important	0.0%	5	0.12	15	0.56	\$0	0
Tammin	Medium importance	36.8%	56	111.38	0	0.00	\$25,587,355	83,929
Three Springs	Fairly important	37.3%	81	112.85	0	0.00	\$42,406,426	135,404
Toodyay	Medium importance	3.1%	54	9.44	7	1.84	\$19,328,889	63,744
Trayning	Medium importance	38.5%	45	116.28	0	0.00	\$10,107,890	34,694
Victoria Plains	Most important	28.2%	113	85.19	3	1.87	\$76,200,504	247,946
Wagin	Fairly important	16.1%	112	48.58	21	10.99	\$31,187,331	97,115
Wandering	Medium importance	32.0%	63	96.68	0	0.00	\$32,930,105	107,842
Wanneroo	Least important	0.0%	16	0.05	67	0.42	\$0	0
West Arthur	Fairly important	25.5%	94	77.02	0	0.00	\$45,384,309	141,323
Westonia	Medium importance	25.4%	35	76.68	0	0.00	\$20,321,046	69,750
Wickepin	Medium importance	38.2%	118	115.45	0	0.00	\$30,045,873	100,776
Williams	Most important	22.9%	110	69.14	7	3.61	\$36,939,546	115,027
Wongan-Ballidu	Most important	24.2%	144	73.17	13	8.02	\$86,358,632	281,855
Woodanilling	Medium importance	36.8%	63	111.38	0	0.00	\$17,857,833	54,364
Wyalkatchem	Most important	36.7%	62	110.91	7	11.19	\$40,915,078	133,537
Wyndham-East Kimberley	Least important	0.9%	28	2.75	0	0.00	\$4,770,258	10,032
Yilgarn	Fairly important	17.7%	100	53.60	0	0.00	\$185,975,403	638,342
York	Fairly important	8.7%	114	26.17	5	1.75	\$33,678,576	108,203

NOTES AND REFERENCES

- ⁱ Based on the Australian Bureau of Statistics' 2016 Census of Population and Housing, using the following ANZSIC occupations: Grain-Sheep or Grain-Beef Cattle Farming, Rice Growing, Other Cotton Growing, Cotton Growing.
- ⁱⁱ Where the top bracket refers to the top 20%, the second bracket is the 20-40% of regions, the third bracket is the 40-60% of regions, the fourth bracket is the 60-80% of regions and the fifth bracket is the bottom 20% (or 80-100% of regions).
- ⁱⁱⁱ Based on the Australian Bureau of Statistics' 2016 Census of Population and Housing, using the following ANZSIC occupations: Oil and Fat Manufacturing, Grain Mill Product Manufacturing, Cereals, Pasta and Baking Mix Manufacturing, Prepared Animal and Bird Feed Manufacturing, Cereal Grain Wholesale, Grain Storage Services.
- ^{iv} Graph generated using Australian Bureau of Statistics Census of Population and Housing data, Place of Work, by Industry, 1 digit ANZSIC Coding, 2016.
- ^v Based on the Australian Bureau of Statistics' 2015-16 Agricultural Census, using the following commodities: Wheat for grain, Oats for grain, Barley for grain, Sorghum for grain, Maize for grain, Rice for Grain, Triticale for grain, All other cereals for grain or seed, Cotton lint (irrigated and non-irrigated), Peanuts in shell, Lentils, Lupins, Chickpeas, Mung beans, Faba beans, Other pulses, Oilseeds (Canola), Other Oilseeds.
- ^{vi} Map generated using a variety of sources, namely Namoi Cotton and grain receival company site maps.
- ^{vii} Australian Bureau of Statistics (2016) Regional Statistics by LGA – Education and Employment Allowances
- ^{viii} Department of Employment, Skills, Small and Family Business (2016) Labour Market Information Portal
- ^{ix} Regional Australia Institute (2016) Innovation in regional Australia: Spreading the ideas boom, Canberra
- ^x Regional Australia Institute (2019) [In]Sight, ed. 2
- ^{xi} Productivity Commission (2005) Trends in Australian agriculture, Research Paper, Canberra.
- ^{xii} Department of Transport and Regional Services (2005) Drought impacts beyond the farm gate: two regional case studies, Canberra
- ^{xiii} Regional Australia Institute (2019) [In]Sight, ed. 2
- ^{xiv} Bureau of Meteorology (2019) Climate Data Online, Monthly Rainfall, Summary statistics for all years; Beechworth, Yackandandah, Chiltern, Rutherglen.
- ^{xv} Indigo Shire Council (2019) Shire Profile <www.indigoshire.vic.gov.au/Living-in-Indigo/About-Indigo-Shire/Shire-profile>
- ^{xvi} Australian Bureau of Statistics (2016) Census of Population and Housing, SA2, Place of Work, Employment by Industry, 4 digit level
- ^{xvii} North East Catchment Management Authority (2019) Embedding Climate Change Adaptation in Agriculture; North East Victoria <www.necma.vic.gov.au/Solutions/Climate-Change/Embedding-Climate-Adaptation-in-Agriculture/Project-Overview-and-Outcomes>
- ^{xviii} Meat and Livestock Australia, 2018, Australia's beef industry; original data source Australian Bureau of Statistics 2017.
- ^{xix} Cooperative Bulk Handling Limited Group, 2019, Locations <https://careers.cbh.com.au/content/LOCATIONS/?locale=en_GB>
- ^{xx} Australian Bureau of Statistics, 2017, Australian Population Grid
- ^{xxi} Western Australian Education and Health Standing Committee, 2015, The impact of FIFO work practices on mental health, ed. 5, Legislative Assembly, Parliament of Western Australia
- ^{xxii} Australian Bureau of Statistics, 2018, Characteristics of Employment, Median weekly earnings in main job – Industry and occupation of main job – By level of highest non-school qualification
- ^{xxiii} This is based on the Department of Jobs and Small Business intent vacancy index, which is a moving 3 month average.
- ^{xxiv} Achurch H (2019) Regional Growth Prospects: Strategic Investment in Food Processing, Tourism, Advanced Manufacturing and Creative Industries. Canberra, The Regional Australia Institute.