

MAY 2021

Economic contribution of the Australian almond industry

Final report

Hort Innovation

Abbreviations

ABS	Australian Bureau of Statistics
CO2e	Carbon Dioxide Equivalent
FTE	Full-Time Equivalent
GRP	Gross Regional Product
GDP	Gross Domestic Product
I-O	Input-Output
KT	Kiloton
NSW	New South Wales
RISE	Regional Industry Structure and Employment
SA	South Australia
Vic	Victoria
WA	Western Australia

Table of Contents

Abbreviations	i
Table of Contents	ii
Executive summary	1
1 Introduction	3
ACKNOWLEDGEMENT OF COUNTRY	3
2 The Australian almond industry	4
2.1 GROWING REGIONS	4
2.2 PRODUCTION	4
2.3 GROWERS	7
2.4 VALUE CHAIN	7
2.5 AUSTRALIAN EXPORTS	8
2.6 GLOBAL PRODUCTION	8
2.7 CONSUMERS	9
3 Economic contribution	11
3.1 INDICATORS OF ECONOMIC ACTIVITY	11
3.2 CATEGORIES OF ECONOMIC ACTIVITY IN THE ALMOND SUPPLY CHAIN	11
3.3 AUSTRALIA-WIDE ECONOMIC CONTRIBUTION	12
3.4 REGIONAL ECONOMIC CONTRIBUTION	17
4 Impact of production risks on economic contribution	19
4.1 SCENARIO 1 – WATER AVAILABILITY REDUCTION	19
4.2 SCENARIO 2 – INDUSTRY WIDE REDUCTION IN PRODUCTION	20
5 Research method	22
5.1 OVERVIEW OF THE METHOD	22
5.2 DATA COLLECTION	22
5.3 ECONOMIC MODELLING	23
Appendix A: Detailed regional contribution results	24
RIVERINA	24
SUNRAYSIA	25
RIVERLAND	27
ADELAIDE PLAINS	28
SWAN REGION	30

Executive summary

In 2019/20 the almond industry contributed \$1.6B to Australian Gross Domestic Product (GDP) and employed 9,560 people. This includes \$534.6M in growing and processing activities, \$44.0M in industry investment, and \$1.1B as a result of flow-on economic activity (\$510.5M production induced and \$544.3M consumption induced). This equates to approximately 0.1 per cent of Australia's GDP, or \$1 for every \$1,000 of GDP.

Estimates of economic contribution in this report include the direct economic contribution from production and processing of almonds, and also the flow-on contribution of the industry in other sectors. The flow-on contribution includes expenditure on goods and services by employees and owners and expenditure in industries such as gas and electricity, construction and transport.

Almonds are produced in NSW, Victoria, South Australia and Western Australia. The highest contributions come from the Sunraysia and Riverland regions, contributing \$482 million and \$213 million to Gross Regional Product (GRP) respectively. In these regions, the almond industry (including flow on activity) is a significant driver of the economy, accounting for 8.3% and 9.2% of Sunraysia and Riverland Gross Regional Product respectively. The industry directly and indirectly employs 2,206 people in the Sunraysia region, and 946 in the Riverland. While the industry makes up a smaller proportion of the Riverina economy (3.0%), its contribution to the local economy in that region is likely to grow as a result of new plantings.

The size and value of the almond industry has increased significantly in the last 20 years and will continue to grow in the future as recent plantings mature. The total area planted has increasing from 3,500 hectares in the year 2000 to 53,014 hectares in 2019. In line with the increase in area dedicated to almond production, the gross value of almonds at the farm gate in Australia has increased fourfold since 2010/11 when it was \$200 million¹ (2019 dollars) to the current value of \$803 million² in 2019/20. Australian almond exports are worth \$773 million³.

This report was commissioned by Horticulture (Hort) Innovation and conducted by RMCG and BDO EconSearch. The research team collected primary data from farmers and processors to understand detailed expenditure and production patterns across the industry. The primary data were scaled up to industry level with secondary data from the Australian Bureau of Statistics and industry data and estimates. Expenditure estimates were converted into estimates of economic contribution using an input-output model⁴.

¹ ABS, 2020, Agricultural Commodities, Australia

² EconSearch modelled estimate

³ Almond insights, 2019-20. Due to value being added to the nut through, exports are worth more than the farm gate value.

⁴ The RISE model (Regional Industry Structure and Employment) has been developed by BDO EconSearch over the past decade and is based on an extension of a conventional input-output method.

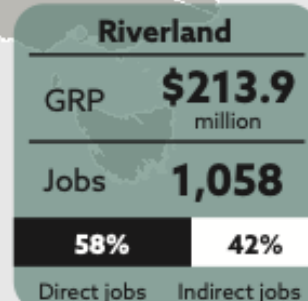
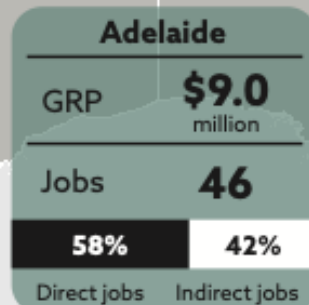
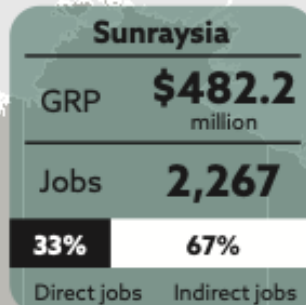
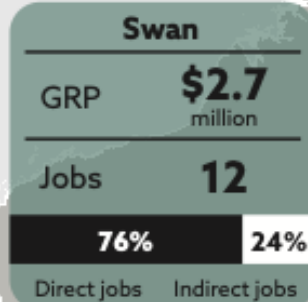
Economic Contribution of the Almond Industry

Australia's almond industry
GDP contribution

\$1.633
billion

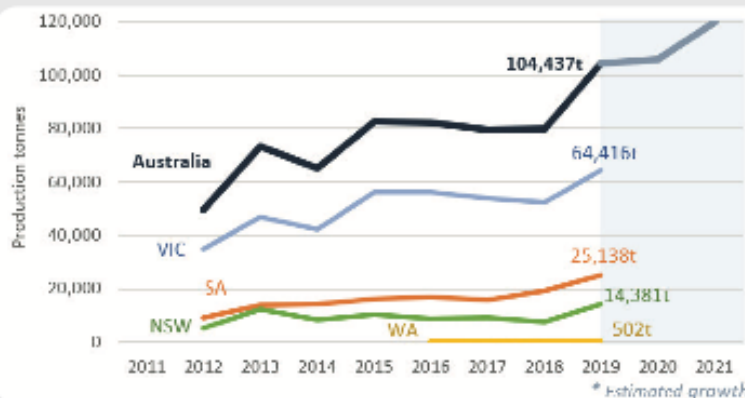
Jobs across the
whole industry

9,560



Since 2000, the total area planted with almonds increased by
3,500 ha to 53,014 ha in 2019/20

Almond production over time:



Dollars generated per
ML water used

\$2,298

RMCG

1 Introduction

The objective of this project was to estimate the economic contribution of the almond industry to regional and Australian economies. The direct, indirect and flow on economic contribution were estimated at a regional and national level, as well as disaggregated by function in the value chain.

Topics covered by the report include:

- Summary of the industry as a whole and future growth (Chapter 2).
- Economic contribution (Chapter 3)
- The economic impact of risks to production (Chapter 4)
- Research method (Chapter 5).

Funding for this report was obtained through Hort Innovation, with support from the Almond Board of Australia (ABA). The authors would like to acknowledge the contribution of the project reference group led by the Almond Board of Australia and those survey participants who shared insights and information via the survey.

ACKNOWLEDGEMENT OF COUNTRY

We acknowledge the Traditional Owners of the Country that we work on throughout Australia and recognise their continuing connection to land, waters, and culture. We pay our respects to their Elders past, present and emerging and the Elders of other Aboriginal and Torres Strait Islander communities. Moreover, we express gratitude for the knowledge and insight that Traditional Owner and other Aboriginal and Torres Strait Islander people contribute to our shared work.

2 The Australian almond industry

2.1 GROWING REGIONS

As shown in Figure 2-1, Australian almonds are grown in southern Australia in five main regions: Sunraysia (Victoria), Riverland (South Australia), Riverina (New South Wales), Swan Region (Western Australia) and Adelaide Plains (South Australia). There are over 15.4 million almond trees planted across the growing regions, of which 29% are not yet bearing crop and a further 18% are not yet mature.

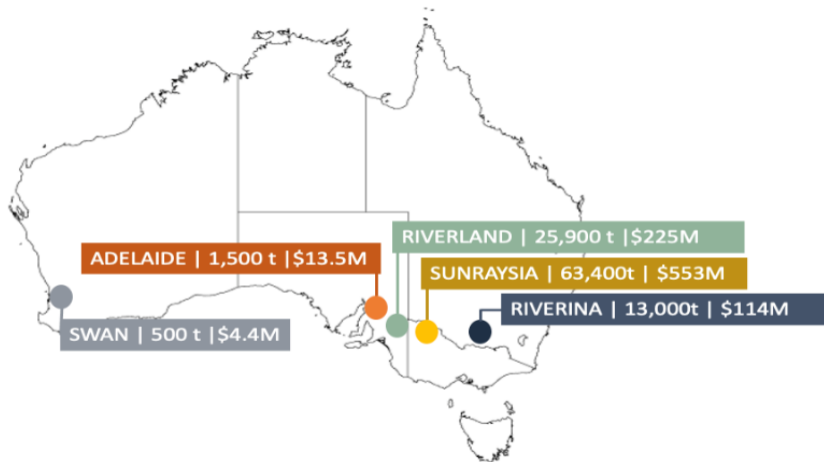


Figure 2-1: Almond production in Australia 2019/2020

Sunraysia produces the largest volumes of almonds (63,400t), followed by the Riverland (25,900t). The Riverina has a high percentage of new plantings and will be a large contributor in the future.

2.2 PRODUCTION

Establishing an almond supply chain requires significant investment including on farm and processing facilities. Almond trees take three years to produce a crop and seven years to reach mature production levels. The productive life of an almond tree is 25 to 30 years.

The size and value of the almond industry has increased significantly in the last 20 years, as shown in Figure 2-2. Total area planted has increased from 3,500 hectares in the year 2000 to 53,014 hectares in 2019/20. Historically, the first almond plantings were established on Kangaroo Island in 1836 followed by the Adelaide gardens. Since then, the industry has expanded to the Riverina, Riverland, Sunraysia and Swan regions. In total there are 37,903 hectares of fruit bearing trees in Australia (Figure 2-3). In 2019, there were 4,548 hectares of new plantings and 15,111 hectares that were not yet mature. From 2011 the gross value of almond production has increased from \$200 million⁵ (2019 dollars) to \$725 million in 2019.

⁵ ABS, 2020, Agricultural Commodities, Australia

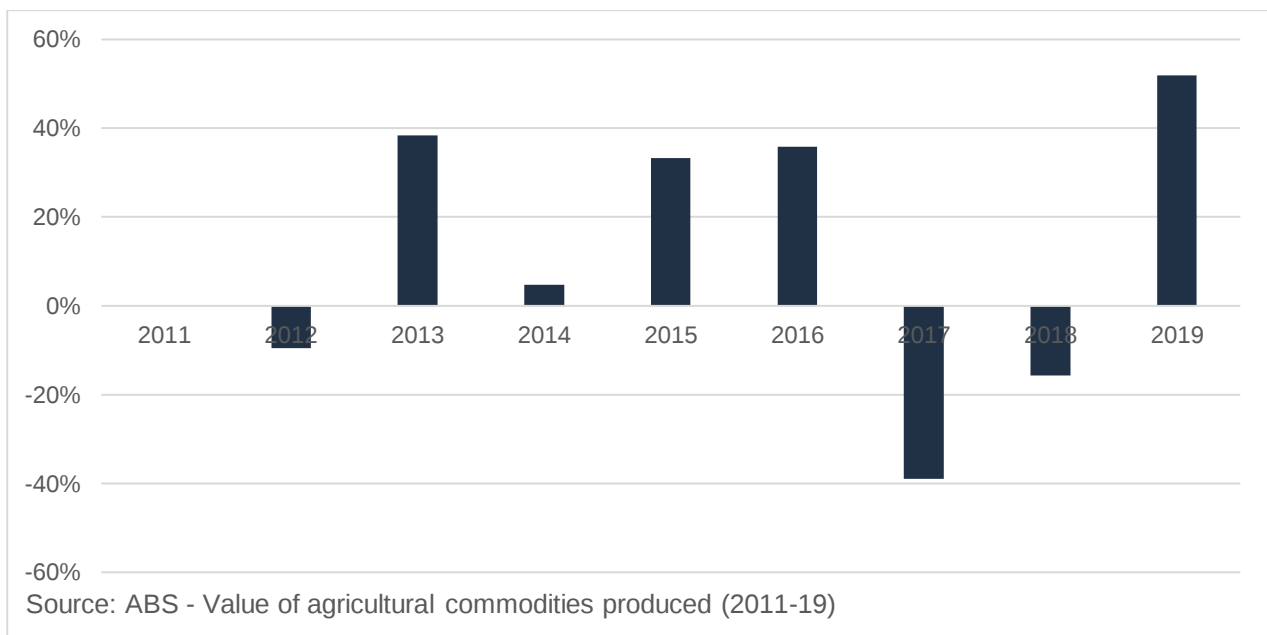


Figure 2-2: Annual growth in value of almond production (2011- 2019)

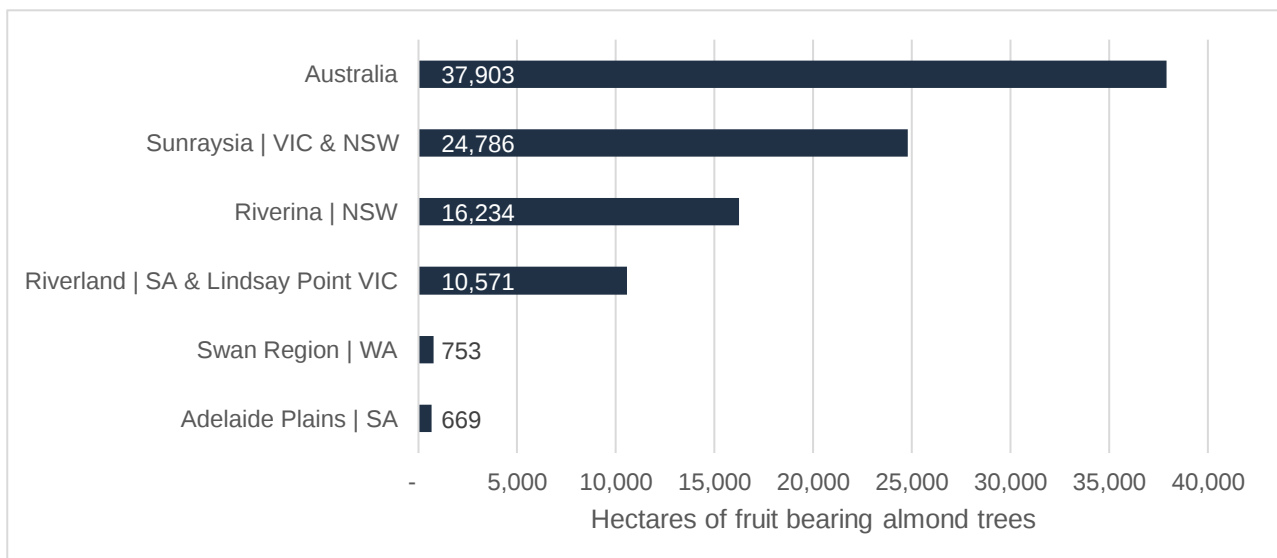


Figure 2-3: Almond fruit bearing plantings by region 2020

In 2020, there were 111,000 kernel tonnes of almonds produced. By 2021, production is expected to increase to 123,000 kernel tonnes. Victoria is the largest almond producing state, accounting for almost 64% of all almond produced in Australia (Figure 2-4).

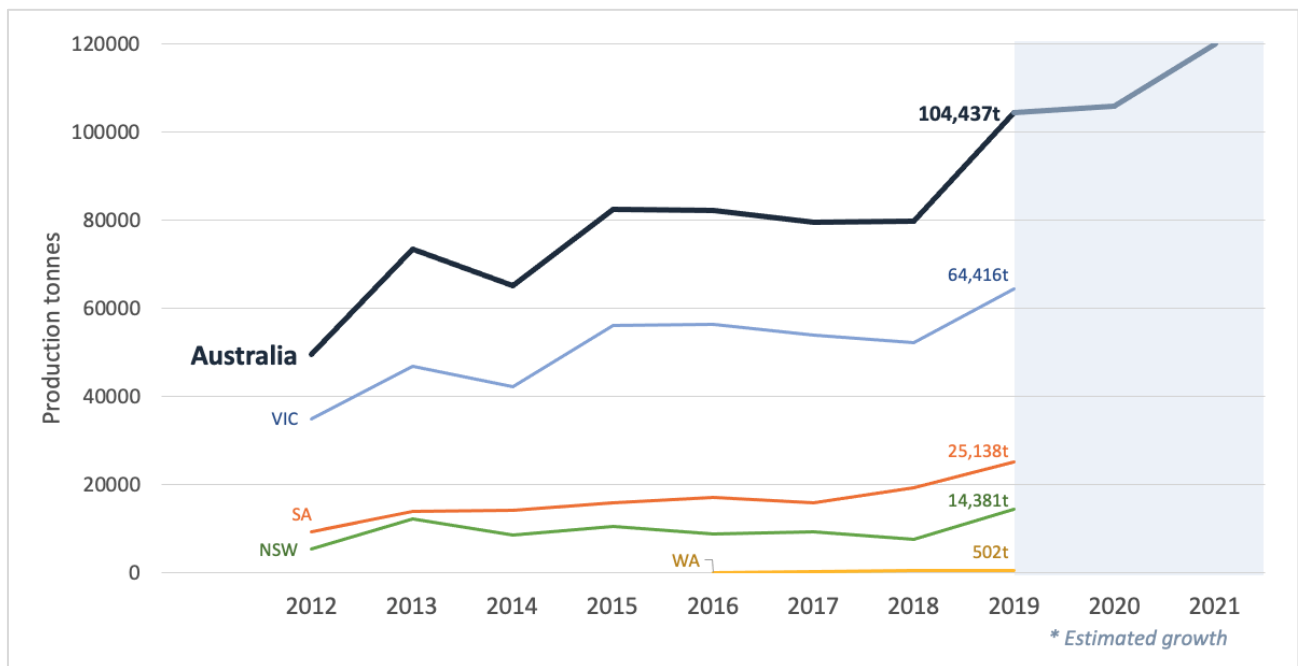


Figure 2-4: Australian almond production volume (tonnes kernel equivalent)

In 2019/20, the estimated production value for almonds harvested was \$803M. The Sunraysia region across Victoria and NSW had the largest production value across all the regions of \$553M due to having the highest volume.

Table 2-1: Estimated almond production value (unimproved farm gate value, 2019/20)

REGION	ESTIMATED FARM GATE PRODUCTION VALUE \$M
Sunraysia VIC & NSW	\$484M
Riverland SA & Lindsay Point VIC	\$207M
Riverina NSW	\$96M
Adelaide Plains SA	\$12M
Swan Region WA	\$4M
Australia	\$803M

2.3 GROWERS

In total there are 189 commercial almond growing properties in Australia. The Riverland and Sunraysia regions have the largest number of properties, as follows:

- Riverland – 80 properties
- Sunraysia – 49 properties
- Riverina – 34 properties
- Adelaide – 24 properties
- Swan (WA) – 1 property.

Over 69% of Australian almond properties are less than 100 hectares in size. Around 55% of properties are less than 50 hectares in size and over half of these farms are family operated (Figure 2-5).

Farming is conducted by both corporate and family-owned farms. Some corporate farms have fully integrated operations, where they process and market most of the almonds, they produce⁶.

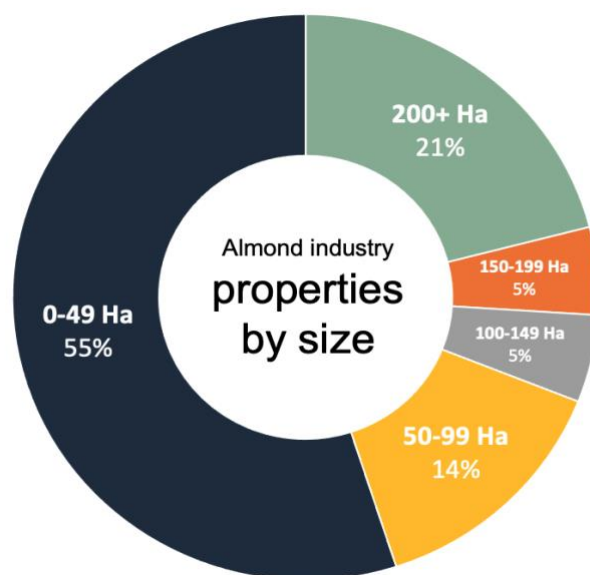


Figure 2-5: Australian almond property size 2019/20

2.4 VALUE CHAIN

The almond value chain is comprised of four segments: growers, hulling and shelling, sorting and packing, and value adders as demonstrated in Figure 2-6. Once almonds have been packed or processed for use in further food manufacturing, the products are ready for the retail or export market. This study includes the value of growing, hulling and shelling, sorting and packing and value adding where it relates directly to the almond industry (represented by the dark blue boxes in Figure 2-6). The wholesaling, retailing and further processing of almonds (where almonds are an ingredient in another food product such as muesli or chocolate), has not been included.

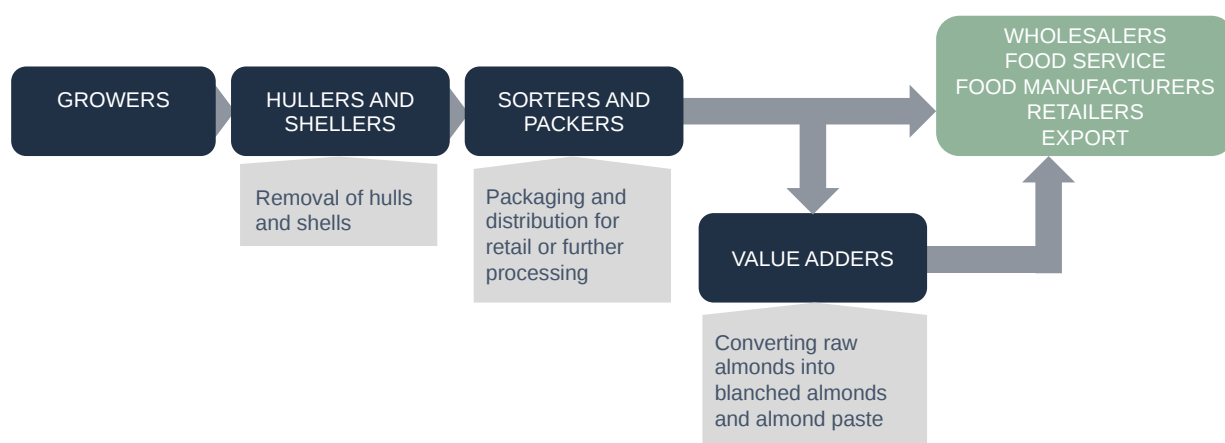


Figure 2-6: Almond value chain

⁶ All data in this section was sourced from: Almond Board of Australia, 2020, Almond insights 2019–2020.

2.5 AUSTRALIAN EXPORTS

In 2019/20 73% of the almond crop (76,600 tonnes) was exported. The value of exports was \$773 million⁷. The value of exports is higher than farm gate value due to processing prior to export, which adds value to the product. Imports are minimal and were 2,800 tonnes in 2019/20⁸.

Most of Australia's exported almonds were sent to Asia Pacific and Oceania (78%) and Europe (16%) (Figure 2-7). In terms of almond types exported, 43,400 tonnes (57%) were almond kernels, and 33,100 tonnes (43%) were in shells.



Figure 2-7: Australia almond exports in 2019/20

Over the last 9 years total exports have increased from 24,483 tonnes (kernel equivalent) to 76,600 tonnes in 2019/20 marketing year, valued at approximately \$530 million making up approximately of 7% of global production. The domestic market has increased over the same period of time from 13,400 to 26,800 tonnes.

2.6 GLOBAL PRODUCTION

Over time, almond production has grown worldwide from over 1 million tonnes in 2013 to 1.4 million tonnes in 2019 (Figure 2-8).

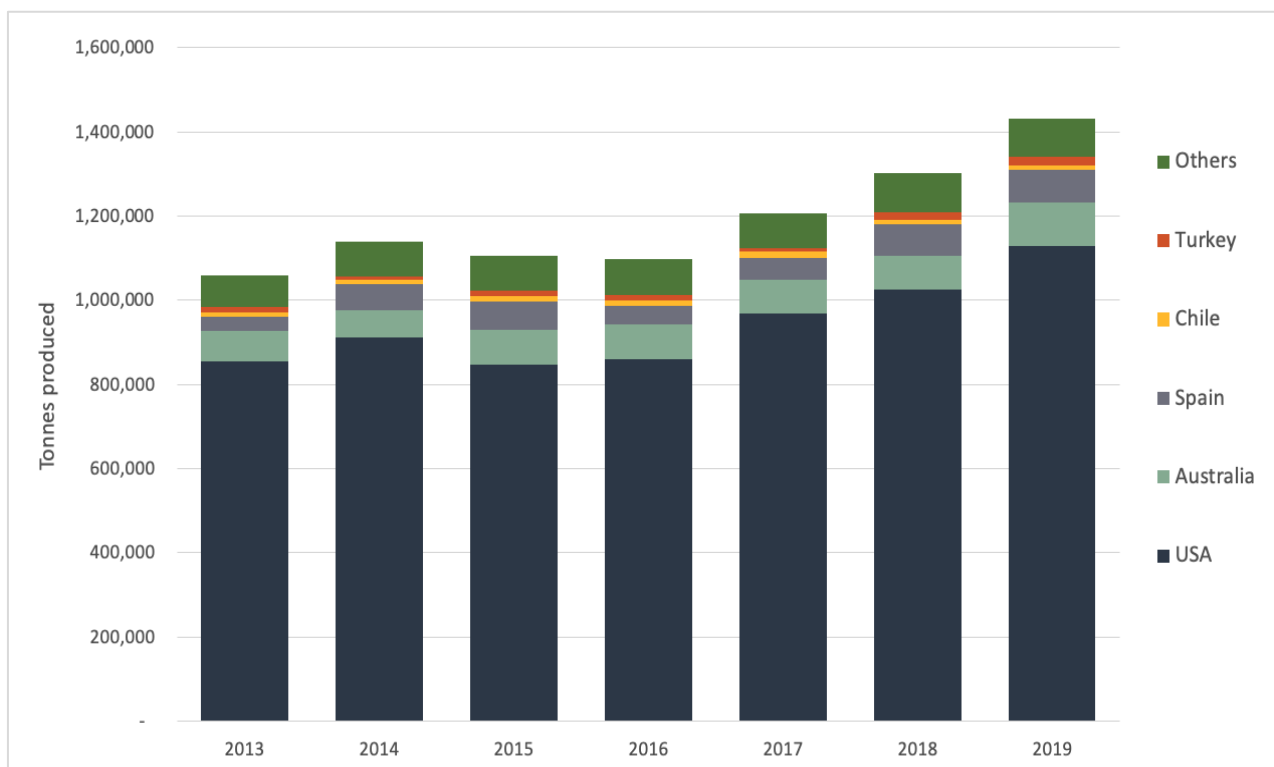


Figure 2-8: Global almond production 2013–2019

⁷ 2019/20 almond marketing year (March 2019 to February 2020).

⁸ All data in this section was sourced from: Almond Board of Australia, 2020, Almond insights 2019–2020.

Almonds are produced in 11 countries. There are only a few places in the world where almonds can be grown commercially, requiring a dry, desert-like climate with a reliable source of water for irrigation.

The USA (mostly California) is by far the largest almond producer, supplying 79% of the world's almonds. Australia is the second largest producer (7%) followed by Spain (6%), Chile (1%) and Turkey (1%), all other countries contribute a combined total of 6%⁹. Other producers include Greece, Iran, Italy, Morocco and Tunisia. Major producers are provided in Figure 2-8.

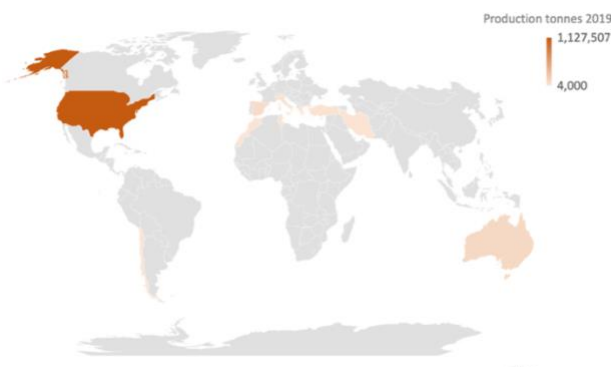


Figure 2-9: Almonds produced by country (tonnes, 2019)

2.7 CONSUMERS

In Australia domestic consumption has grown by 106% in 10 years from 14,300 tonnes to 29,500 tonnes in 2019/20. This reflects the rise in popularity of almonds in the Australian diet. During the 2019-20 year, almonds were the most frequently used nut ingredient in new products launched in Australia. The five main categories for new products launched included snacks, cereal, confectionary, dairy, and bakery. Growth in the almond industry is expected to continue to increase. The number of new products introduced globally featuring almonds increased 13% YoY to 12,206 in 2019.

The health benefits of almonds are promoted on the basis of being an excellent source of protein, vitamin E, dietary fibre and monounsaturated fat, which has been associated with decreasing the risk of heart disease, diabetes and cancer¹⁰.

Americans consume approximately one kilogram of almonds per capita, which is similar to Australia's per capita consumption of 1.17kg¹¹. However, both countries rank fifth and sixth in terms of per capita consumption (Figure 2-10).¹² Consumption per capita is:

- Netherlands 1.53kg
- Spain 1.43kg
- Greece 1.42kg
- Tunisia 1.42kg
- Australia 1.17kg
- USA 1.03kg.

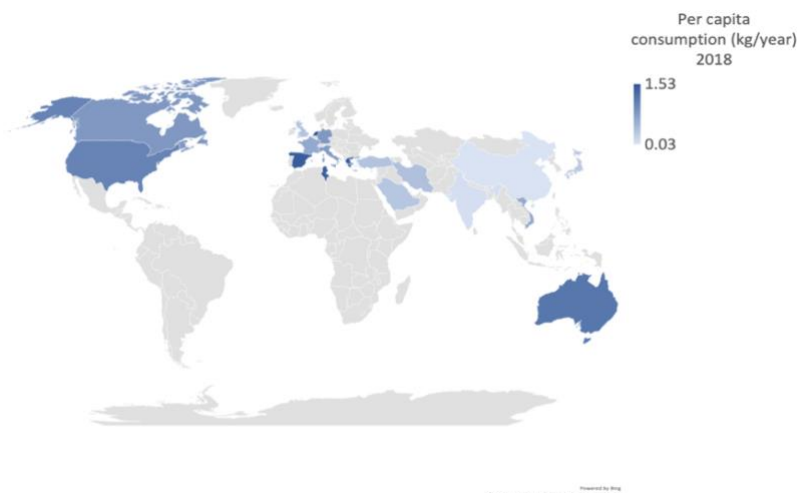


Figure 2-10: Per capita consumption of almonds (kg/year, 2018)

While world almond consumption per capita is relatively low in developing countries, the continued growth of the middle-class in these countries is leading to increased consumption, which is having a growing impact on global almond demand. Consumption growth in these countries will support the long term growth of the industry in Australia. For instance, the Chinese middle class are adopting tree nuts, including almonds, as part of their

⁹ Portugal now have substantial plantings and will become a major producer in future years.

¹⁰ Almond Board of Australia, 2020, Almond insights 2015–16 and 2019–20.

¹¹ Almond Board of California, Almond Almanac Annual Report 2019, https://www.almonds.com/sites/default/files/2020-04/2019_Almanac.pdf.

¹² This excludes re-export to other countries as retail almonds and manufactured products.

daily diet. In India, almonds have long been considered a prized 'brain food' for children. According to the USDA, global almond consumption increased by 4.8% per year in the 5 years to 2019/20¹³.

¹³ Source: <https://downloads.usda.library.cornell.edu/usda-esmis/files/tm70mv16z/jm2155639/sq87c996m/TreeNuts.pdf>

3 Economic contribution

3.1 INDICATORS OF ECONOMIC ACTIVITY

The focus of this report is the generation of economic activity by the almond industry. The economic activity indicators used are gross regional product (GRP), gross domestic product (GDP), employment, household income and output.

Gross Regional Product (GRP) is a measure of the contribution of an activity to the regional economy. The direct GRP of an industry is measured as the value of gross output (business revenue) less the cost of goods and services (including imports) used in producing the output. It can also be measured as the sum of wages and profits¹⁴. GRP represents payments to the primary inputs of production (labour, capital and land).

Gross Domestic Product (GDP) is the same concept as GRP, however, it is applied to the national economy.

Full Time Equivalent (FTE) is an indicator of employment and measures a worker's involvement in a project or industry activity. An FTE of 1.0 means that the person is equivalent to a full-time worker, while an FTE of 0.5 signals that the worker is only half-time.

Household Income is a component of GDP/GRP and is a measure of wages and salaries paid in cash and in-kind, drawings by owner operators and other payments to labour including overtime payments, employer's superannuation contributions and income tax, but excluding payroll tax.

Output is a measure of the gross revenue of goods and services produced by commercial organisations (e.g., farm-gate value of production) and gross expenditure by government agencies.

The economic contributions presented in this section includes both the operating and investment activity.

3.2 CATEGORIES OF ECONOMIC ACTIVITY IN THE ALMOND SUPPLY CHAIN

A useful way to think about the economic contribution or impact of a particular activity is to refer to the supply chain. Broadly speaking, each economic indicator has four levels of economic impact across the economy. For example, with respect to employment:

1. **Direct employment** – this is employment in those firms, businesses and organisations that are directly engaged in almond activity:
 - Growing
 - Hulling and shelling
 - Sorting and packing
 - Value adding.
2. **First round employment** – refers to employment in firms that supply inputs and services to the 'direct employment' businesses, i.e., those categorised under 1 above and may include:
 - Farm-input sectors including all inputs used by agriculture such as fertiliser, transport and storage services
 - Agricultural service sectors including nurseries, agronomists and beekeepers
 - Business support services, such as transport, finance and administration.

¹⁴ This is also the sum of household income, gross operating surplus and gross mixed income minus payments to owner managers and taxes less subsidies on products and production.

3. **Industrial-support employment** – is the term applied to 'second and subsequent round' effects as successive waves of output increases occur in the economy to provide industrial support, as a response to the original almond industry expenditure, i.e., the activity in sectors that provide goods and services to those businesses that supply directly to the almond industry.
4. **Consumption-induced employment** – is the term applied to those effects induced by increased household income associated with the original almond industry expenditure. The expenditure of household income associated with all three categories of employment (direct, first round and industrial support) will generate economic activity that will in itself generate jobs.

In this report we use the terms 'direct', 'production-induced', 'consumption-induced', 'flow-on' and 'total' to describe the economic impacts across the economy:

- 'Direct' = (1) above
- 'Production induced' = (2 + 3)
- 'Consumption induced' = (4)
- 'Flow-on' = (2 + 3 + 4)
- 'Total' = (1 + 2 + 3 + 4).

These categories are illustrated in Figure 3-1 below.

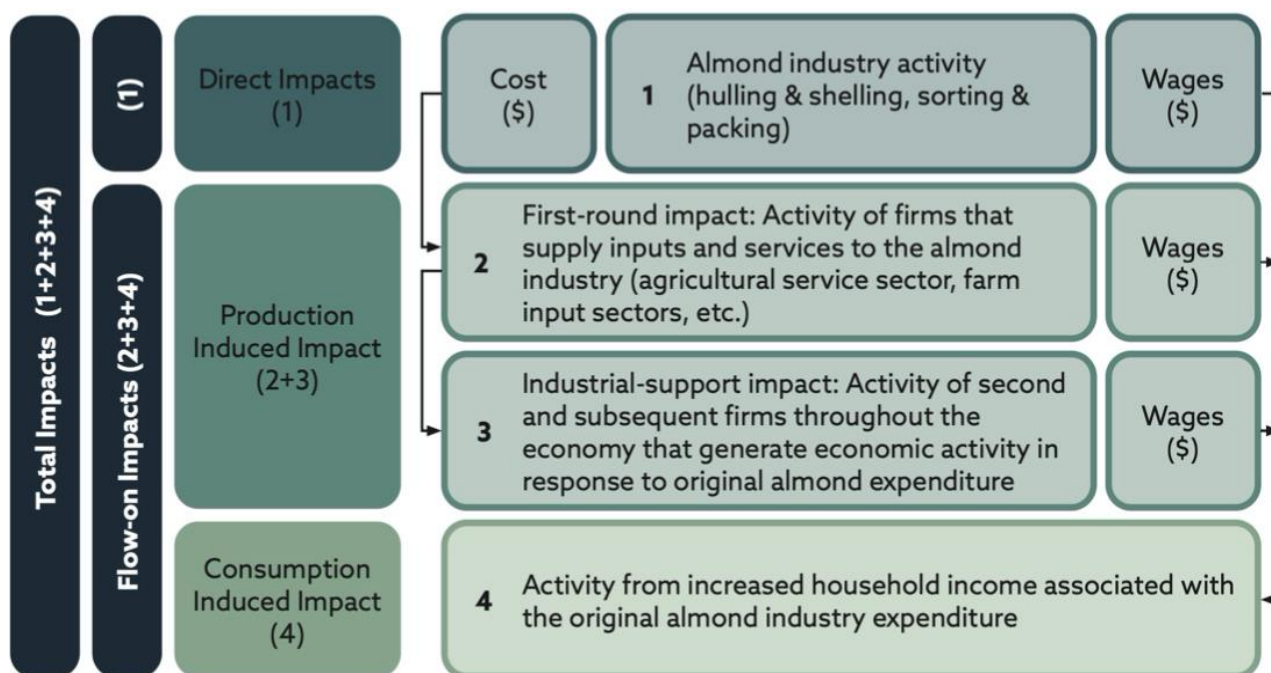


Figure 3-1: Categories of economic activity in the Australian almond industry

3.3 AUSTRALIA-WIDE ECONOMIC CONTRIBUTION

3.3.1 WHOLE ALMOND INDUSTRY (GROWING AND PROCESSING)

The results presented in represent the economic contribution of the whole almond industry in 2019/20. The contribution to GDP from the almond industry was estimated to be \$1.6B in 2019/20 (Table 3-1). This comprised \$534.6M from growing and processing activities, \$44.0M from industry investment, and \$1.1B as a result of flow-on economic activity (\$510.5M production induced and \$544.3M consumption induced). The total gross contribution is approximately 0.1 per cent of Australia's GDP in 2018/19 (\$1.9 trillion).

There were an estimated 2,066 FTE jobs generated directly by the almond industry (1,761 FTE jobs from growing and processing and 305 FTE jobs from investment), with a further 7,295 flow-on FTE jobs (3,435 FTE

production induced and 3,861 FTE consumption induced) giving total employment a contribution of 9,361 FTE jobs. This represents approximately 0.1 per cent of Australia's employment in 2018/19 (13.8 million FTE jobs).

Table 3-1: Summary of the economic contribution of almond growing and processing to Australia, 2019/20

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	534.6	33%	1,761	19%	2,018	21%	155.3	21%	1,118.3 ^a	33%
Capital Investment	44.0	3%	305	3%	267	3%	27.5	4%	112.7	3%
Flow-on										
Production Induced	510.5	31%	3,435	37%	3,233	34%	61.2	31%	1,131.1	34%
Consumption Induced	544.3	33%	3,861	41%	4,042	42%	74.4	37%	997.3	30%
Total	1,633.4	100%	9,361	100%	9,560	100%	744.5	100%	3,359.4	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

Table 3-2 presents the economic contribution of the whole almond industry for contributing sectors. The sectors shown in this table are the top ten contributors to flow-on GDP. For GDP the largest contributing sectors were Ownership of Dwellings (\$105.7M), Finance (\$85.3M), Professional Scientific and Technical Services (\$77.8M), Water Supply, Sewage and Drainage Services (\$65.3M) and Wholesale Trade (\$55.2M).

Table 3-2: Economic contribution of almond growing and processing to Australia, by top 10 contributing sectors, 2019/20

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	534.6	33%	1,761	19%	2,018	21%	155.3	21%	1,118.3 ^a	33%
Capital Investment	44.0	3%	305	3%	267	3%	27.5	4%	112.7	3%
Flow-on										
Ownership of Dwellings	105.7	6%	0	0%	0	0%	0.0	0%	140.2	4%
Finance	85.3	5%	187	2%	178	2%	17.0	2%	104.4	3%
Prof Scientific Tech Serv	77.8	5%	740	8%	693	7%	74.6	10%	149.2	4%
Water Sup, Sew & Drainage	65.3	4%	136	1%	125	1%	16.9	2%	121.5	4%

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
Wholesale Trade	55.2	3%	509	5%	459	5%	39.5	5%	116.5	3%
Retail Trade	44.0	3%	401	4%	341	4%	34.2	5%	96.5	3%
Rental Hiring Real Estate	42.8	3%	636	7%	748	8%	33.0	4%	73.5	2%
Road Transport	42.2	3%	219	2%	206	2%	18.4	2%	99.6	3%
Admin Support Serv	41.2	3%	579	6%	608	6%	39.8	5%	61.6	2%
Personal & Other Serv	33.9	2%	460	5%	475	5%	30.7	4%	63.8	2%
Other Sectors	461.5	28%	3,429	37%	3,442	36%	257.5	35%	1,101.6	33%
Total	1,633.4	100%	9,361	100%	9,560	100%	744.5	100%	3,359.4	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

3.3.2 ALMOND GROWING

The results presented in Table 3-3 represent the economic contribution of almond growing to the economy. The contribution to gross domestic product (GDP) from almond growing in Australia in 2019/20 was estimated to be \$1.2B. This comprises \$363.9M from growing activities, \$38.1M from industry investment, and \$807.4M as a result of flow-on economic activity (\$408.8M production induced and \$398.6M consumption induced). The total gross contribution is approximately 0.1 per cent of Australia's GDP¹⁵.

There were an estimated 1,145 FTE jobs¹⁶ generated directly by the almond industry (890 FTE jobs from growing and processing and 256 FTE jobs from investment), with a further 5,494 of flow-on FTE jobs (2,667 FTE production induced and 2,827 FTE consumption induced), giving a total employment contribution of 6,640 FTE jobs. This represents less than 0.1 per cent of Australia's employment in 2018/19 (13.8 million FTE jobs).

Table 3-3: Summary of the economic contribution of almond growing to Australia, 2019/20

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	363.9	30%	890	13%	1,107	16%	96.1	18%	803.3	32%
Capital Investment	38.1	3%	256	4%	224	3%	23.0	4%	95.7	4%
Flow-on										
Production Induced	408.8	34%	2,667	40%	2,503	37%	222.7	41%	903.2	36%

¹⁵ As measured in 2018/19: \$1.9 trillion.

¹⁶ Includes casual workers

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
Consumption Induced	398.6	33%	2,827	43%	2,960	44%	203.4	37%	730.4	29%
Total^a	1,209.4	100%	6,640	100%	6,794	100%	545.2	100%	2,532.6	100%

a Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

The economic contribution of almond growing for contributing sectors is presented in Table 3-4. The sectors shown in the table are the top ten contributors to flow-on GDP. For GDP, the largest contributing sectors were Ownership of Dwellings¹⁷ (\$77.4M), Finance (\$65.0M), Professional Scientific and Technical Services (\$62.1M), Water Supply, Sewerage & Drainage (\$58.4M) and Wholesale Trade (\$36.9M).

Table 3-4: Economic contribution of almond growing to Australia, by top 10 contributing sectors, 2019/20

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	363.9	30%	890	13%	1,107	16%	96.1	18%	803.3	32%
Capital Investment	38.1	3%	256	4%	224	3%	23.0	4%	95.7	4%
Flow-on										
Ownership of Dwellings	77.4	6%	0	0%	0	0%	0.0	0%	102.6	4%
Finance	65.0	5%	121	2%	112	2%	15.2	3%	108.7	4%
Prof Scientific Tech Service	62.1	5%	142	2%	135	2%	13.0	2%	79.6	3%
Water Sup, Sew & Drainage	58.4	5%	591	9%	554	8%	59.6	11%	119.2	5%
Wholesale Trade	36.9	3%	341	5%	307	5%	26.4	5%	78.0	3%
Rental Hiring Real Estate	34.1	3%	175	3%	164	2%	14.7	3%	79.4	3%
Retail Trade	32.5	3%	306	5%	260	4%	26.1	5%	73.5	3%
Road Transport	32.1	3%	470	7%	553	8%	24.4	4%	54.4	2%
Admin Support Service	29.0	2%	407	6%	428	6%	28.1	5%	43.4	2%
Personal & Other Services	26.1	2%	355	5%	366	5%	23.7	4%	49.2	2%
Other Sectors	353.7	29%	2,585	39%	2,583	38%	195.0	36%	845.6	33%

¹⁷ Understood differently to 'traditional' industries, Ownership of Dwellings is housing services provided by Australia's housing stock. Out of household income supported by the almond industry expenditures are made by households to maintain and improve the housing stock and income is counted either as rent or imputed rent.

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
Total^a	1,209.4	100%	6,640	100%	6,794	100%	545.2	100%	2,532.6	100%

a Totals may not sum due to rounding.

Source: BDO EconSearch Analysis.

3.3.3 ALMOND PROCESSING

The results presented in Table 3-5 represent the economic contribution of almond processing. The contribution to GDP from almond processing in Australia in 2019/20 was estimated to be \$424.0M. This comprised \$170.7M from processing activities, \$5.9M from industry investment, and \$247.4M as a result of flow-on economic activity (\$101.7M production induced and \$145.7M consumption induced). The total gross contribution is less than 0.1 per cent of Australia's GDP in 2018/19 (\$1.9 trillion). Almond processing represents approximately 0.8 per cent of the direct contribution to GDP by the Food Product Manufacturing sector (ANZSIC 2-Digit)¹⁸.

The analysis showed there is an estimated 920 FTE jobs generated directly by the almond industry (871 FTE jobs from growing and processing and 49 FTE jobs from investment), with a further 1,801 flow-on FTE jobs (768 FTE production induced and 1,033 FTE consumption induced) giving a total employment contribution of 2,722 FTE jobs. This represents less than 0.1 per cent of Australia's employment in 2018/19 (13.8 million FTE jobs).

Table 3-5: Summary of the economic contribution of almond processing to Australia, 2019/20

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	170.7	40%	871	32%	911	33%	59.2	30%	923.9	64%
Capital Investment	5.9	1%	49	2%	43	2%	4.5	2%	17.0	1%
Flow-on										
Production Induced	101.7	24%	768	28%	730	26%	61.2	31%	227.9	16%
Consumption Induced	145.7	34%	1,033	38%	1,082	39%	74.4	37%	266.9	19%
Total^a	424.0	100%	2,722	100%	2,766	100%	199.3	100%	1,435.7	100%

a Totals may not sum due to rounding.

Source: BDO EconSearch Analysis.

Table 3-6 presents the economic contribution of almond processing for contributing sectors. The sectors shown in the table are the top ten contributors to flow-on GDP. For GDP the largest contributing sectors were Ownership of Dwellings (\$28.3M), Finance (\$20.3M), Wholesale Trade (\$18.2M), Professional Scientific and Technical Services (\$15.6M) and Administrative and Support Services (\$12.2M).

¹⁸ ABS Australian National Accounts, 2017-18

Table 3-6: Economic contribution of almond processing to Australia, by top 10 contributing sectors, 2019/20

	GROSS DOMESTIC PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	170.7	40%	871	32%	911	33%	59.2	30%	923.9	64%
Capital Investment	5.9	1%	49	2%	43	2%	4.5	2%	17.0	1%
Flow-on										
Ownership of Dwellings	28.3	7%	0	0%	0	0%	0.0	0%	37.5	3%
Finance	20.3	5%	44	2%	42	2%	4.0	2%	24.8	2%
Wholesale Trade	18.2	4%	168	6%	152	5%	13.0	7%	38.5	3%
Prof Scientific Tech Serv	15.6	4%	149	5%	139	5%	15.0	8%	30.0	2%
Admin Support Serv	12.2	3%	171	6%	180	7%	11.8	6%	18.2	1%
Retail Trade	11.5	3%	166	6%	195	7%	8.6	4%	19.2	1%
Road Transport	10.0	2%	95	4%	81	3%	8.1	4%	23.0	2%
Rental Hiring Real Estate	8.7	2%	97	4%	111	4%	8.2	4%	12.4	1%
Health & Community Serv	8.6	2%	45	2%	42	2%	3.7	2%	20.3	1%
Education & Training	8.2	2%	102	4%	107	4%	7.7	4%	12.1	1%
Other Sectors	105.6	25%	764	28%	763	28%	55.4	28%	258.9	18%
Total	424.0	100%	2,722	100%	2,766	100%	199.3	100%	1,435.7	100%

a Totals may not sum due to rounding.

Source: BDO EconSearch Analysis.

3.4 REGIONAL ECONOMIC CONTRIBUTION

The contribution to GRP from each of the five almond production regions is shown in Table 3-7. The highest contributions come from the Sunraysia and Riverland regions, contributing \$482 million and \$213 million to Gross Regional Product (GRP) respectively. In these regions, the almond industry (including flow on activity) is a significant driver of the economy, accounting for 8.3% and 9.2% of Sunraysia and Riverland Gross Regional Product respectively. The industry directly and indirectly employs 2,206 people in the Sunraysia region, and 946 in the Riverland. While the industry makes up a smaller proportion of the Riverina economy (3.0%), it is set to grow in that region as a result of new plantings.

Table 3-7: Regional contribution to gross regional product

REGION	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT	
	(\$M)	(% of region)	(FTE)	(% of region)
Riverina	\$111M	3.0%	611	2.1%
Sunraysia	\$482M	8.3%	2,206	4.7%
Riverland	\$214M	9.2%	946	5.2%
Adelaide Plains	\$9M	0.4%	40	0.2%
Swan	\$3M	0.4%	10	0.4%

These estimates are explored more fully in Appendix A.

CASE STUDY: REGIONAL EMPLOYMENT AT CENTURY ORCHARDS

The number of almond orchards in Australia has increased dramatically in the past decade, providing a substantial boost to local economies. Century Orchards are a Riverland company based in Loxton and have recently become a public (unlisted) company. Starting in 1998 growing grapes, Century Orchards now grow 700 ha of almonds and employ about 30 staff.

Most of the Orchards employees live locally in Loxton and Renmark, and for a typical growing season Century Orchards will employ:

- An orchard manager and assistant manager
- Technical officer
- Admin (accounts, compliance, support, PA)
- Mechanic
- Welder
- Irrigation and fertilisation specialist
- Permanent orchard staff
- Casual harvest staff.

Brendan Sidhu is the CEO at Century Orchards and is passionate about employing, training and keeping staff. When asked about investment in the company skill base, Brendan said “We are strongly focused on training our staff – all full-time orchard employees complete a Cert III in Horticulture and casuals go through the Chem cert training.” Brendan went on to say “ We really encourage our younger staff to complete the Cert IV in Horticulture and then go on to the Diploma. Our staff are worth investing in, we want to train them.”

Brendan is focused on maintaining a flexible working environment, and said “people ask me what happens if you train them and they leave? I say, what happens if you don’t train them and they stay for life?”

4 Impact of production risks on economic contribution

As part of the economic analysis two risks to industry production were identified in consultation with the project reference group and modelled (i) a significant water reduction in the Sunraysia region and (ii) a national reduction in production. This section presents the estimated economic impact of each of these risks.

4.1 SCENARIO 1 – WATER AVAILABILITY REDUCTION

The experience of severe droughts in 2007/09 and again in 2017/19 has tested water availability to all irrigators, including almond growers. A repeat of a drought with equal severity to the drought of 2007/8 and 2008/9 will lead to a shortage of water available for all irrigated crops, including some permanent plantings, including almonds.

Lower value irrigation activities (rice, cotton, dairy) will trade temporary water to higher-value, permanent crops (almonds, citrus and grapes). However, there will also be some reduction of water available to permanent plantings. Responses by almond orchard owners will include:

- Buying water allocations at a high price on annual markets.
- Reducing total crop area by de-watering. This may be coordinated with tree pulls related to orchard rejuvenation or result in permanently abandoning the worst-performing crop areas.
- Reduce water use per hectare. This will reduce yield and production in that season and may adversely impact long-term tree health.

The water availability scenario was modelled as a reduction of 75 GL of water used by almond growers. There will be differences between regions. Regions *less* affected will be those with:

- Access to reliable groundwater such as the Lachlan and Murrumbidgee valleys.
- High security entitlements still being used for annual crops including cotton such as the Murrumbidgee Valley.
- Government policies that have increased drought reserves through more conservative water reserves policies (i.e. by setting aside greater reserves earlier), thus leading to increased certainty of supply during extended droughts for some classes of water entitlement holders. This has been particularly apparent in SA's Murray irrigation areas.

Given the above, the large almond plantings in NSW and Victoria near Robinvale and the Sunraysia region are the most vulnerable to lower allocations and reduced water availability in a future drought.

Thus, a reduction of 75 GL of water was modelled entirely in the Sunraysia region, where water use by growers was estimated to be 264 GL in 2019/20 (a 28% reduction in water for almond production). The reduction in water use was estimated to be equivalent to a 15,625 tonne reduction in almonds produced¹⁹. The change in almond production equates to about a 25 per cent reduction in almonds grown and processed in Sunraysia (this assumes processing scales proportionally to growing).

Operating impacts were modelled based on the 25 per cent change to production, with an equivalent per cent change in variable costs for both farm and processing activities in Sunraysia. Replacement capital expenditure for growers was also decreased by 25 per cent. All capital investment for new productive capacity (growing and processing) were assumed to be nil under this scenario.

¹⁹ The decrease in production was calculated based on an average water use of 12 ML/ha and a yield of 2.5 tonnes/ha (for low performing farms).

4.1.1 RESULTS

Table 4-1 presents the regional economic impact of reduced water availability on the almond industry in the Sunraysia region. This shows that, while production can be expected to drop by 25 per cent, GRP is expected to drop by a greater proportion because of reduced business profit resulting from lost economies of scale. Wages also decrease, which is a component of GRP.

This has been modelled as a short term shock only. In the long term, there may be some offsetting increases in production in other irrigation industries, not necessarily located in the Sunraysia region, as the water previously used by the almond industry is traded to other industries. This offsetting increase has not been modelled here, and thus, this modelling represents the impact on the Sunraysia region only, assuming that the water is traded to other regions.

Table 4-1: Summary of the economic impact of reduced water availability in Sunraysia region

REGION	GROSS REGIONAL PRODUCT			EMPLOYMENT FULL TIME EQUIVALENT		
	Current almond contribution (2019/20)	Change as a result of shock	Remaining almond contribution post-shock	Current almond contribution (2019/20)	Change as a result of shock	Remaining almond contribution post-shock
Sunraysia	\$482M	-\$214M	\$268M	2,206	-733	1,473

Source: BDO EconSearch analysis.

4.2 SCENARIO 2 – INDUSTRY WIDE REDUCTION IN PRODUCTION

The second scenario modelled was a generic risk, taking the form of a uniform reduction of 10 per cent of almonds grown across all regions. At the national level almond processing activity was also assumed to decrease by 10 per cent, in line with growing.

The change in almond processing (from growing regions) was calculated as the change in almonds grown (10 per cent across all regions) multiplied by the national average portion of almonds processed (76 per cent of almonds grown). Processing activity was modelled for the Sunraysia, Riverland and Riverina regions, given the reduced activity occurring in the remaining regions. Accordingly, the change in processed almonds was allocated based on the nearest region²⁰. Processing was estimated to decrease by 13 per cent in Riverina, 11 per cent in Sunraysia and 8 per cent in Riverland.

Operating impacts were modelled based on the above per cent changes to farm production (10 per cent decrease) and processing production (as above). Variable costs were adjusted in line with the change to production. Replacement capital expenditure for growers were also modelled to decrease by 10 per cent. All capital investment for new productive capacity (growing and processing) was assumed to be nil under the scenario.

4.2.1 RESULTS

The results presented in Table 4-2 represent the economic impact of a 10 per cent reduction across all almond growing regions to the regional economies. As above, the reduction in GRP and GDP is larger than the 10 per cent reduction in production in each region.

²⁰ That is Riverina processing changed in line with Riverina almonds grown, Riverland processing changed in line with Riverland and Adelaide almonds grown and Sunraysia processing changed in line with the residual change in almonds grown.

As with the first risk, this analysis shows the short term impact of a shock. It assumes there is no offsetting increase in another irrigated crop in the region.

Table 4-2: Summary of the economic impact of a 10 per cent reduction in almond production across all regions, 2019/20

REGION	GROSS REGIONAL PRODUCT			EMPLOYMENT FULL TIME EQUIVALENT		
	Current (2019/20)	Change as a result of shock	After the shock	Current (2019/20)	Change as a result of shock	After the shock
Riverina	\$111M	-\$39M	\$72M	611	-220	391
Sunraysia	\$482M	-\$96M	\$386M	2,206	-416	1,790
Riverland	\$214M	-\$44M	\$170M	946	-188	758
Adelaide Plains	\$9M	-\$1M	\$8M	40	-4	36
Swan	\$3M	-\$0.3M	\$2.7M	10	-1	9

Source: BDO EconSearch analysis.

5 Research method

5.1 OVERVIEW OF THE METHOD

To generate the estimates of regional economic impact presented in this report the project team undertook a combination of data collection and economic modelling:

- **Data collection.** We surveyed almond farmers and processors to understand at a detailed level the expenditure and production patterns in the industry. This was scaled up to industry level with secondary data from industry and the Australian Bureau of Statistics.
- **Economic modelling.** BDO EconSearch's input-output model, RISE (Regional Industry Structure and Employment) was used to convert expenditure estimates into estimates of economic contribution.

Further detail on the method is provided below.

5.2 DATA COLLECTION

5.2.1 PRIMARY PRODUCTION

Data on primary production were collected through the Australian Bureau of Statistics (ABS), ABA and interviews collectively.

ABS and the industry data included information on the overall scale of production for each region. Two main data items were used:

- Gross value of production
- Total weight of almonds processed 1 July 2019 to 30 June 2020.

Twelve almond farmers, who were broadly representative of the range of farmers in terms of size and location, were surveyed. The survey was used to gather more detailed information about primary production that is not already publicly available:

- Enterprise-level production in terms of gross value and quantity of almonds produced
- Breakdown of expenditure by business inputs
- The geographic source of inputs (local region, Australia or international).

The detailed information from the survey was scaled to the industry level using the ABS and industry data on:

- The total weight of almonds produced
- The total weight of almonds processed by processors.

5.2.2 PROCESSING

Similarly, data on the processing sector were collected through interviews, ABS and ABA data.

ABS and ABA data provided the overall scale of the industry:

- Quantity of almonds sold
- Quantity of almonds processed
- Value of almond sales.

More detailed data collected through the processing survey included:

- Enterprise-level production in terms of gross value and quantity of almonds harvested

- Breakdown of expenditure by business area (farm or processor) and by business inputs associated with each business area
- The geographic source of inputs (local region, Australia or international).

As with the primary production sector, the detailed information from the questionnaire was scaled to the industry level using the ABS and industry data.

5.3 ECONOMIC MODELLING

The estimates of regional economic contribution and impact presented in this report use the RISE (Regional Industry Structure and Employment) model. The RISE model has been developed by BDO EconSearch over the past decade and is based on an extension of a conventional input-output method.

Input-output (I-O) models are widely used to assess the economic contribution of existing, or impact of changing levels of economic activity²¹. I-O models are developed at national, state and regional levels. For this analysis RISE models were constructed for each almond growing region.

RISE models have been constructed for the Australian Government at both a state and regional level to assess the economic activity of the almond industry in Australia.

²¹ Called an 'exogenous shock' in economic modelling terminology.

Appendix A: Detailed regional contribution results

RIVERINA

The contribution to GRP from the whole almond industry in the Riverina region in 2019/20 was estimated to be \$111.6M. This comprised \$54.9M from growing and processing activities, \$16.3M from industry investment, and \$40.4M as a result of flow-on economic activity (\$21.5M production induced and \$18.9M consumption induced). The total gross contribution was approximately 3.0 per cent of Riverina GRP in 2018/19 (\$3.8 billion), with expected growth in the future.

There were an estimated 308 FTE jobs generated directly by the almond industry (191 FTE jobs from growing and processing and 116 FTE jobs from investment), with a further 304 flow-on FTE jobs (178 FTE production induced and 126 FTE consumption induced) giving a total employment contribution of 611 FTE jobs. This represents approximately 2.1 per cent of Riverina's employment in 2018/19 (29,200 FTE jobs), with expected growth in the future.

Summary of the economic contribution of the whole almond industry to Riverina, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	54.9	49%	191	31%	251	39%	14.0	30%	112.5 ^a	47%
Capital Investment	16.3	15%	116	19%	100	15%	9.5	20%	40.2	17%
Flow-on										
Production Induced	21.5	19%	178	29%	164	25%	14.6	31%	53.2	22%
Consumption Induced	18.9	17%	126	21%	135	21%	8.4	18%	33.1	14%
Total^b	111.6	100%	611	100%	650	100%	46.6	100%	239.0	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch Analysis.

For GRP, the largest contributing sectors were Ownership of Dwellings (\$6.8M), Road Transport (\$4.3M), Retail Trade (\$2.7M), Wholesale Trade (\$2.5M) and Finance (\$2.1M).

Economic contribution of the whole almond industry, by top 10 contributing sectors, to Riverina, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	54.9	49%	191	31%	251	39%	14.0	30%	112.5 ^a	47%
Capital Investment	16.3	15%	116	19%	100	15%	9.5	20%	40.2	17%
Flow-on										
Ownership of Dwellings	6.8	6%	0	0%	0	0%	0.0	0%	9.1	4%
Road Transport	4.3	4%	36	6%	31	5%	3.5	8%	9.9	4%
Retail Trade	2.7	2%	39	6%	44	7%	2.2	5%	4.6	2%
Wholesale Trade	2.5	2%	28	5%	28	4%	1.9	4%	4.1	2%
Finance	2.1	2%	23	4%	20	3%	1.7	4%	5.5	2%
Admin Support Serv	2.0	2%	3	1%	3	0%	0.5	1%	3.0	1%
Personal & Other Serv	1.9	2%	9	1%	8	1%	0.9	2%	4.8	2%
Rental Hiring Real Estate	1.9	2%	5	1%	4	1%	0.5	1%	2.6	1%
Water Sup, Sew & Drainage	1.7	1%	25	4%	26	4%	2.0	4%	3.4	1%
Prof Scientific Tech Serv	1.6	1%	14	2%	13	2%	1.5	3%	3.2	1%
Other Sectors	13.0	12%	122	20%	121	19%	8.5	18%	36.1	15%
Total^b	111.6	100%	611	100%	650	100%	46.6	100%	239.0	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

SUNRAYSIA

The contribution to GRP from the whole almond industry in the Sunraysia region in 2019/20 was estimated to be \$482.2M in total, comprising \$265.3 from growing and processing activities, \$10.4M from industry investment, and \$206.4M as a result of flow-on economic activity (\$132.3M production induced and \$74.1M consumption induced). The total gross contribution is approximately 8.3 per cent of Sunraysia GRP in 2018/19 (\$5.8 billion).

There were an estimated 694 FTE jobs generated directly by the almond industry (618 FTE jobs from growing and processing and 76 FTE jobs from investment), with a further 1,513 flow-on FTE jobs (931 FTE production induced and 582 FTE consumption induced) giving a total employment contribution of 2,206 FTE jobs. This represents approximately 4.7 per cent of Sunraysia's employment in 2018/19 (46,900 FTE jobs).

Summary of the economic contribution of the whole almond industry to Sunraysia, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	265.3	55%	618	28%	670	30%	60.2	34%	579.0 ^a	55%
Capital Investment	10.4	2%	76	3%	68	3%	5.9	3%	28.4	3%
Flow-on										
Production Induced	132.3	27%	931	42%	892	39%	73.4	42%	310.3	29%
Consumption Induced	74.1	15%	582	26%	638	28%	36.7	21%	135.5	13%
Total^b	482.2	100%	2,206	100%	2,267	100%	176.2	100%	1,053.1	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch Analysis.

The sectors shown in the table below are the top ten contributors to flow-on GRP. For GRP the largest contributing sectors were Water Supply and Sewage Services (\$40.4M), Ownership of Dwellings (\$21.2M), Retail Trade (\$10.8M), Road Transport (\$10.6M), and Pharmaceutical & Other Chemical Products (\$10.5M).

Economic contribution of the whole almond industry, by top 10 contributing sectors, to Sunraysia, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	265.3	55%	618	28%	670	30%	60.2	34%	579.0 ^a	55%
Capital Investment	10.4	2%	76	3%	68	3%	5.9	3%	28.4	3%
Flow-on										
Water Sup, Sew & Drainage	40.4	8%	85	4%	79	3%	12.0	7%	85.9	8%
Ownership of Dwellings	21.2	4%	0	0%	0	0%	0.0	0%	29.7	3%
Retail Trade	10.8	2%	70	3%	65	3%	5.5	3%	30.9	3%
Road Transport	10.6	2%	93	4%	79	3%	7.2	4%	24.9	2%
Pharma & OTH Chem Products	10.5	2%	152	7%	178	8%	7.7	4%	18.1	2%
Rental Hiring Real Estate	10.0	2%	48	2%	45	2%	4.4	3%	22.4	2%
Personal & Other Serv	9.3	2%	135	6%	139	6%	8.5	5%	19.8	2%
Health & Community Serv	8.7	2%	89	4%	105	5%	8.0	5%	12.3	1%

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
Prof Scientific Tech Serv	7.7	2%	77	4%	75	3%	7.3	4%	15.4	1%
Education & Training	7.1	1%	95	4%	100	4%	6.4	4%	9.8	1%
Other Sectors	69.9	14%	668	30%	666	29%	43.1	24%	176.7	17%
Total^b	482.2	100%	2,206	100%	2,267	100%	176.2	100%	1,053.1	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

RIVERLAND

The contribution to GRP from the almond industry in the Riverland region in 2019/2020 was estimated to be \$213.9M in total, comprising \$151.8M from growing and processing activities, \$7.1M from industry investment, and \$55.1M as a result of flow-on economic activity (\$31.9M production induced and \$23.1M consumption induced). The total gross contribution is approximately 9.2 per cent of Riverland GRP in 2018/19 (\$2.3 billion).

There were an estimated 505 FTE jobs generated directly by the almond industry (453 FTE jobs from growing and processing and 52 FTE jobs from investment), with a further 441 flow-on FTE jobs (269 FTE production induced and 172 FTE consumption induced) giving a total employment contribution of 946 FTE jobs. This represents approximately 5.2 per cent of Riverland's employment in 2018/19 (18,000 FTE jobs).

Summary of the economic contribution of the whole almond industry to Riverland, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	151.8	71%	453	48%	568	54%	31.6	48%	263.0 ^a	67%
Capital investment	7.1	3%	52	5%	45	4%	4.0	6%	16.5	4%
Flow-on										
Production induced	31.9	15%	269	28%	254	24%	19.9	30%	75.8	19%
Consumption induced	23.1	11%	172	18%	190	18%	10.9	16%	37.0	9%
Total^b	213.9	100%	946	100%	1,058	100%	66.3	100%	392.3	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

For GRP in the Riverland the largest contributing sectors were, Road Transport (\$7.5M), Ownership of Dwellings (\$7.4M), Water Supply and Sewage Services (\$5.1M), Wholesale Trade (\$4.0M) and Retail Trade (\$3.9M).

Economic contribution of the whole almond industry, by top 10 contributing sectors, to Riverland, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	151.8	71%	453	48%	568	54%	31.6	48%	263.0 ^a	67%
Capital Investment	7.1	3%	52	5%	45	4%	4.0	6%	16.5	4%
Flow-on										
Road Transport	7.5	4%	76	8%	62	6%	5.5	8%	16.9	4%
Ownership of Dwellings	7.4	3%	0	0%	0	0%	0.0	0%	9.2	2%
Water Sup, Sew & Drainage	5.1	2%	10	1%	9	1%	1.5	2%	10.2	3%
Wholesale Trade	4.0	2%	50	5%	51	5%	3.3	5%	6.7	2%
Retail Trade	3.9	2%	62	7%	73	7%	3.1	5%	6.6	2%
Personal & Other Serv	3.9	2%	30	3%	27	3%	2.8	4%	7.3	2%
Rental Hiring Real Estate	2.1	1%	15	2%	15	1%	0.7	1%	4.8	1%
Finance	2.0	1%	4	0%	5	0%	0.4	1%	2.4	1%
Prof Scientific Tech Serv	1.9	1%	21	2%	21	2%	1.9	3%	3.7	1%
Health & Community Serv	1.8	1%	11	1%	10	1%	0.8	1%	5.7	1%
Other Sectors	15.4	7%	163	17%	172	16%	10.7	16%	39.2	10%
Total^b	213.9	100%	946	100%	1,058	100%	66.3	100%	392.3	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch Analysis.

ADELAIDE PLAINS

The contribution to GRP from the whole almond industry in the Adelaide Plains region in 2019/2020 was estimated to be \$9.0M in total, comprising \$6.4 from growing and processing activities, \$0.1M from industry investment, and \$2.4M as a result of flow-on economic activity (\$1.4M production induced and \$1.0M consumption induced). The total gross contribution is approximately 0.4 per cent of Adelaide Plains GRP in 2018/19 (\$2.3 billion).

There were an estimated 20 FTE jobs generated directly by the almond industry (19 FTE jobs from growing and processing and 1 FTE jobs from investment), with a further 20 flow-on FTE jobs (13 FTE production induced and 7 FTE consumption induced) giving a total employment contribution of 40 FTE jobs. This represents approximately 0.2 per cent of Adelaide Plains' employment in 2018/19 (17,100 FTE jobs).

Summary of the economic contribution of the whole almond industry to Adelaide Plains, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	6.4	71%	19	48%	26	56%	1.4	50%	12.4 ^a	70%
Capital Investment	0.1	2%	1	3%	1	2%	0.1	3%	0.3	2%
Flow-on										
Production Induced	1.4	16%	13	32%	12	26%	0.9	32%	3.3	19%
Consumption Induced	1.0	11%	7	17%	8	16%	0.4	15%	1.6	9%
Total^b	9.0	100%	40	100%	46	100%	2.9	100%	17.7	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

In the Adelaide Plains, the largest contributing sectors to GRP were Ownership of Dwellings (\$0.4M), Road Transport (\$0.4M), Personal and Other Services (\$0.1M), Retail Trade (\$0.1M) and Wholesale Trade (\$0.1M).

Economic contribution of the whole almond industry, by top 10 contributing sectors, to Adelaide Plains, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	6.4	71%	19	48%	26	56%	1.4	50%	12.4 ^a	70%
Capital Investment	0.1	2%	1	3%	1	2%	0.1	3%	0.3	2%
Flow-on										
Ownership of Dwellings	0.4	5%	0	0%	0	0%	0.0	0%	0.5	3%
Road Transport	0.4	4%	4	11%	4	8%	0.3	11%	0.8	5%
Personal & Other Serv	0.1	2%	2	5%	2	4%	0.1	4%	0.3	2%
Retail Trade	0.1	1%	1	3%	1	2%	0.1	2%	0.3	2%
Wholesale Trade	0.1	1%	2	5%	2	5%	0.1	3%	0.2	1%
Rental Hiring Real Estate	0.1	1%	1	2%	1	1%	0.0	1%	0.3	2%
Ag, Forestry & Fishing Serv	0.1	1%	1	3%	1	2%	0.1	4%	0.2	1%
Prof Scientific Tech Serv	0.1	1%	1	3%	1	3%	0.1	4%	0.2	1%
Pharma & OTH Chem Products	0.1	1%	1	2%	1	1%	0.0	1%	0.3	2%

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
Water Sup, Sew & Drainage	0.1	1%	0	0%	0	0%	0.0	1%	0.2	1%
Other Sectors	0.7	8%	7	17%	7	15%	0.4	15%	1.5	9%
Total^b	9.0	100%	40	100%	46	100%	2.9	100%	17.7	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

SWAN REGION

The contribution to GRP from the whole almond industry in the Swan region in 2019/2020 was estimated to be \$2.7M in total, comprising \$2.1 from growing and processing activities, \$0.1M from industry investment, and \$0.5M as a result of flow-on economic activity (\$0.3M production induced and \$0.2M consumption induced). The total gross contribution is approximately 0.4 per cent of Swan GRP in 2018/19 (\$752 million).

There were an estimated 7 FTE jobs generated directly by the almond industry (6 FTE jobs from growing and processing and 1 FTE jobs from investment), with a further 3 flow-on FTE jobs (2 FTE production induced and 1 FTE consumption induced) giving a total employment contribution of 10 FTE jobs. This represents approximately 0.4 per cent of Swan's employment in 2018/19 (2,500 FTE jobs).

Summary of the economic contribution of the whole almond industry to Swan, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	2.1	77%	6	63%	8	71%	0.5	62%	4.0 ^a	75%
Capital Investment	0.1	4%	1	7%	1	5%	0.1	9%	0.3	6%
Flow-on										
Production Induced	0.3	11%	2	25%	2	18%	0.2	24%	0.8	14%
Consumption Induced	0.2	7%	1	6%	1	6%	0.0	5%	0.3	5%
Total^b	2.7	100%	10	100%	12	100%	0.8	100%	5.4	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch Analysis.

For GRP in the Swan region the largest contributing sectors were Road Transport (\$0.1M), Ownership of Dwellings (\$0.1M), Water Supply and Sewerage Services (<\$0.1M), Pharmaceutical and Other Chemicals (<\$0.1M) and Personal and Other Services (<\$0.1M).

Economic contribution of the whole almond industry, by top 10 contributing sectors, to Swan, 2019/20

	GROSS REGIONAL PRODUCT		EMPLOYMENT FULL TIME EQUIVALENT		EMPLOYMENT NUMBER OF JOBS		HOUSEHOLD INCOME		OUTPUT	
	(\$M)	%	(FTE)	%	(no.)	%	(\$M)	%	(\$M)	%
Direct										
Operating	2.1	77%	6	63%	8	71%	0.5	62%	4.0 ^a	75%
Capital Investment	0.1	4%	1	7%	1	5%	0.1	9%	0.3	6%
Flow-on										
Road Transport	0.1	5%	1	11%	1	8%	0.1	11%	0.2	4%
Ownership of Dwellings	0.1	4%	0	0%	0	0%	0.0	0%	0.1	2%
Water Sup, Sew & Drainage	0.0	1%	0	1%	0	1%	0.0	1%	0.1	1%
Pharma & OTH Chem Products	0.0	1%	0	2%	0	1%	0.0	3%	0.1	2%
Personal & Other Serv	0.0	1%	0	3%	0	2%	0.0	3%	0.1	1%
Wholesale Trade	0.0	1%	0	2%	0	1%	0.0	2%	0.1	1%
Construction Services	0.0	1%	0	2%	0	1%	0.0	2%	0.0	1%
Prof Scientific Tech Serv	0.0	1%	0	2%	0	1%	0.0	2%	0.0	1%
Ag, Forestry & Fishing Serv	0.0	0%	0	2%	0	2%	0.0	1%	0.0	1%
Rental Hiring Real Estate	0.0	0%	0	1%	0	1%	0.0	1%	0.0	1%
Other Sectors	0.1	3%	1	6%	1	5%	0.0	4%	0.2	4%
Total^b	2.7	100%	10	100%	12	100%	0.8	100%	5.4	100%

a Excludes the value of almonds used by processors to avoid double counting.

b Totals may not sum due to rounding.

Source: BDO EconSearch analysis.

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