

Contribution of Australian horticulture industry

A GENERAL EQUILIBRIUM ANALYSIS
REPORT SUMMARY



- Australian horticulture contributed \$15.2 billion to Australia's GDP in 2020-21.
- The industry employed the full-time equivalent (FTE) of 64,650 workers, adding \$9.6 billion in value.
- Including processing, the industry had a gross value of production (GVP) of \$17.8 billion, employed 69,700 workers, and added \$10.2 billion in value.
- North West (Mildura) in Victoria is Australia's largest horticultural region, with a GVP of \$1.69 billion. It has value added of \$1.07 billion and employs more than 6,930 workers FTE.
- For every dollar of horticultural value added, an additional 27.6 cents is generated in the rest of the economy.
- For every 100 jobs in the horticulture industry, an additional 21.3 jobs are created in other sectors of the economy.
- Commodities and regions with higher export potential are projected to enjoy strong future growth.
- Powerful economic modelling will allow the industry to demonstrate its current and future contribution to stakeholders.

The picture for Australian horticulture over the short to medium term is one of value and employment growth across almost all horticultural commodities.

- The value of the industry is projected to increase by 22.5% from 2020 reaching \$21.8 billion in 2030.
- Horticultural industry employment is projected to increase by almost 10% from 2020, reaching 69,697 persons by 2030.

Economic modelling analysis commissioned by Hort Innovation set out to:

- Estimate the current and future contributions of the horticulture industry to the national, state and regional economies;
- Outline industry projections to 2030 using three scenarios — termed High, Central and Low — each with different assumptions about future growth; and
- Provide detailed case studies in four key regions.

The model's main scenario ('Central') reflects long-term average conditions and projects the value of the horticulture industry to increase to \$21.8 billion by 2030. In the same period, employment is projected to increase to 76,372 persons.

While overall projected horticulture industry growth is 22.5%, the growth projections vary across commodities. Commodities with substantial export growth potential have higher growth projections. For example, bananas, which are almost exclusively consumed domestically, are projected to grow by 14% to 2030. In contrast, almonds, with a strong export market focus, are projected to grow by 42.4% to 2030.

The report uses a
'general equilibrium'
modelling framework,
which allows the
accurate measurement
of the flow effects of an
industry's activities

Measuring the contribution of an industry to the economy is challenging. It is usually measured by the amount of value that industry adds to the Gross Domestic Product (GDP), Gross State Product (GSP) or Gross Regional Product (GRP).

The value added includes the industry's income or return to production factors. Production factors include land, labour and capital.

As an industry operates, it creates additional economic activities by increasing demand for resources and generating more income. This is called the 'induced effect' and should be considered when measuring an industry's contribution to the economy.

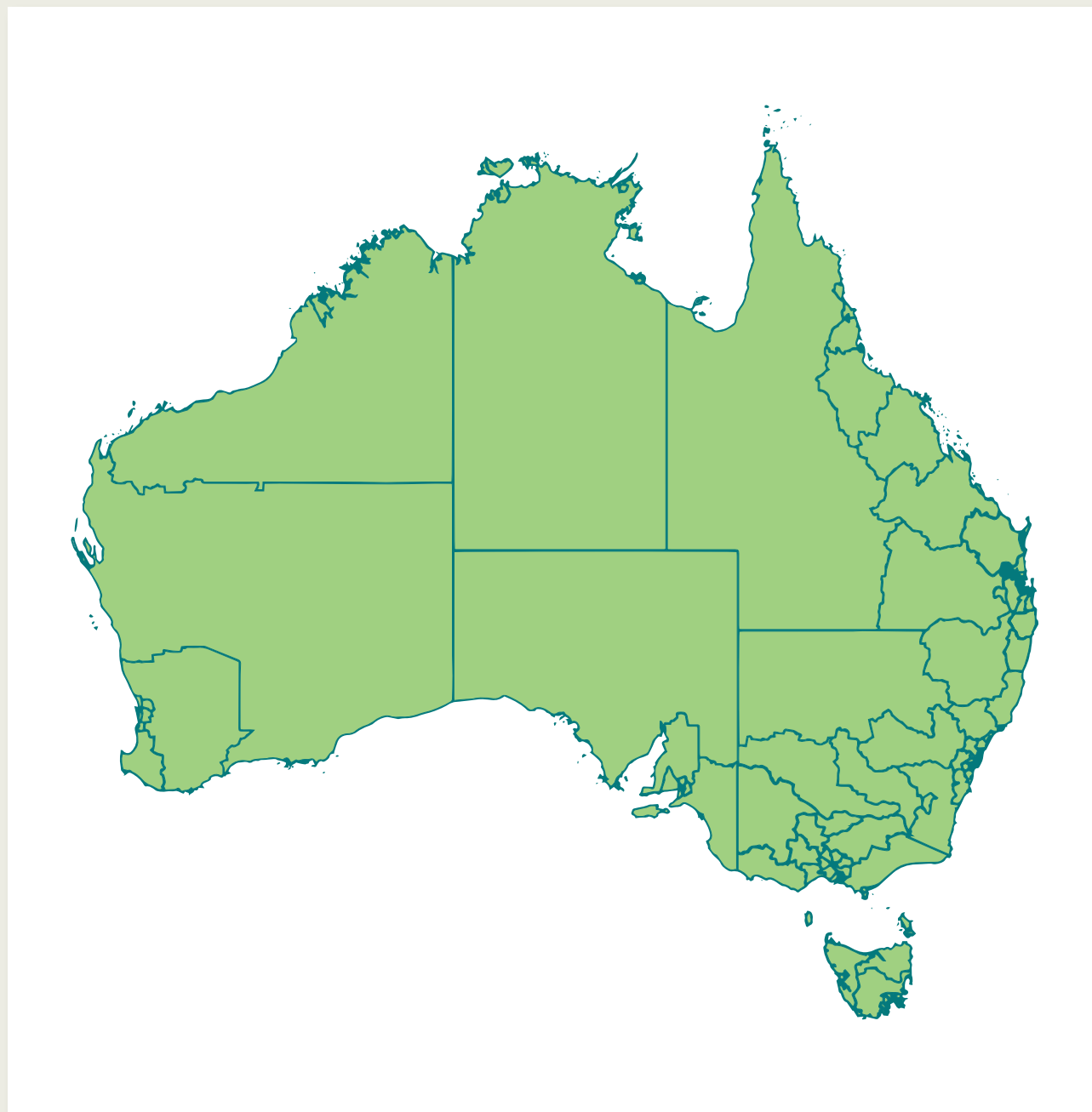
The report uses a 'general equilibrium' modelling framework, which allows the accurate measurement of the flow effects of an industry's activities. In particular, the report combines three economic models:

- CIE FP model, a computable general equilibrium model of Australian economies with detailed description of food value chains;
- HI_LINK, a detailed horticulture value chain model that identifies 48 horticulture farming and processing commodities; and
- A Regional Module, to transform the state-level results into 25 regions (Chart 1).

When estimating the future contribution of an industry, the report recognises the uncertainties associated with the industry's outlook and the wider economy. This was done by constructing three different scenarios (High, Central and Low).

The general equilibrium framework provides the horticultural industry as a whole – and the individual commodities that it comprises – with a tool with which they can explain their size and importance to the economy when engaging with stakeholders. It has the potential to explore a range of scenarios, for example, the impact of an investment or policy decision.

1. Horticulture regions for the analysis



This modelling recognises 25 horticultural growing regions nationally, with the top 10 representing about two thirds of the country's horticulture industry by GVP.

In 2020-21, the Australian horticulture industry contributed \$15.2 billion to Australia's GDP. It employed around 64,650 full-time equivalent workers, and had value added of \$9.6 billion. Including processing, the industry had a gross value of production (GVP) of \$17.8 billion, employed about 69,700 workers, and had value added of around \$10.2 billion.

This modelling recognises 25 horticultural growing regions nationally, with the top 10 representing about two thirds of the country's horticulture industry by GVP.

Of these, the highest contribution comes from the North West (Mildura) in Victoria, with a GVP of \$1.7 billion, and a value added of \$1.1 billion, representing 10.1% of GRP. This region produces 78% of the nation's table grapes and 62% of its almonds. The industry here directly and indirectly employs more than 7,800 people, or 9.3% of the regional workforce.

Melbourne is the second largest region for growing and processing, with a GVP of \$1.55 billion, a value added of \$841 million, and employment of about 6,530 workers FTE. The Rest of Queensland comes in third, with a GVP of \$1.31 billion, a value added of \$734 million and employment of 5,280 workers FTE. Shepparton in Victoria is the fourth largest horticulture region in terms of GVP (\$1.22 billion).

The Rest of Victoria, Sydney, Queensland's Wide Bay region, South Australia's South East (Adelaide Plains), the Toowoomba-Ipswich-Darling Downs – Maranoa (TIDD-M) region in Queensland, and Cairns/Mareeba are also significant contributors. Greater Melbourne and Greater Sydney also make the top 10 due to their large processing industries, vegetable sectors, and amenity horticulture (including nurseries, cultivated turf, and cut flowers) that serve the urban population.



“For every 100 jobs in the horticulture industry, an additional 21.3 jobs are created in other sectors of the economy.”

Value added

For every dollar of horticultural value added, an additional 27.6 cents is generated in the rest of the economy. The horticulture industry's value added represents the income created through labour, land (natural resources), and capital; that is, new value generated during production (as opposed to intermediate inputs from other industries). The horticulture industry contributes \$12.96 billion to the national economy, including \$10.16 billion directly and \$2.80 billion indirectly.

Employment

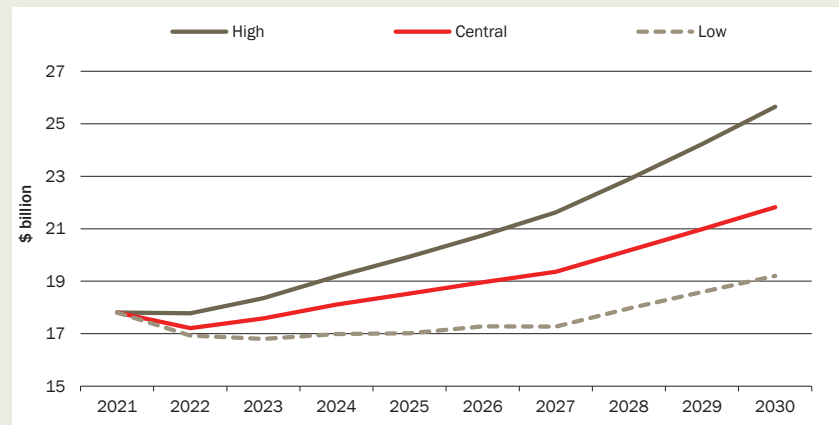
The horticulture industry creates more jobs than just the ones directly related to it. For every 100 jobs in the horticulture industry, an additional 21.3 jobs are created in other sectors of the economy as a result of the industry's economic activity. The report estimates that the horticulture industry would induce about 14,835 additional FTEs in other industries, leading to a total employment contribution of about 84,530 FTEs.

It is important to note that as the report uses Australian Bureau of Statistics (ABS) data, including from the Census, it does not capture the full variation of employment over the year as seasonal workers are used in peak harvest times.

For every dollar of horticultural value added, an additional 27.6 cents is generated in the rest of the economy.

To acknowledge the uncertainties associated with the industry's outlook and the wider economy, the report uses three scenarios – High, Central and Low.

2. Projected horticulture GVP by scenario



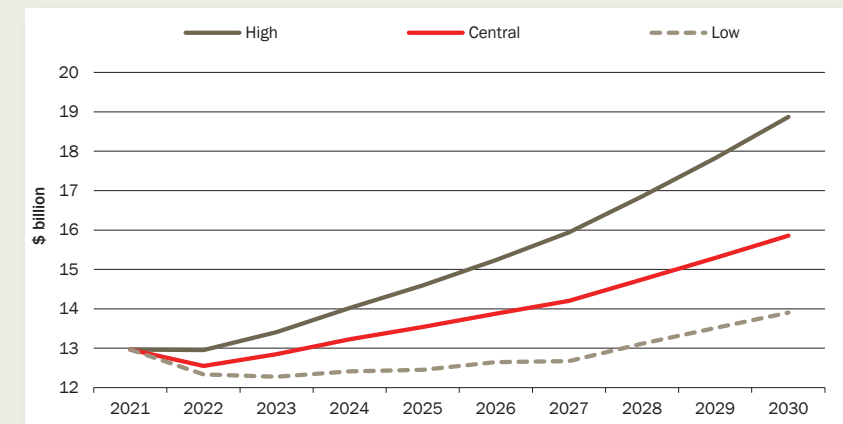
Data source: CIE modelling

By 2030, under the Central scenario, the gross value of product (GVP) is projected to reach \$21.8 billion, with an average annual growth rate of 2.3%. Under the High scenario, GVP is projected to reach \$25.6 billion, representing average annual growth of 4.1%, while under the Low scenario, GVP would reach \$19.2 billion (only 0.8% average annual growth). The High and Low scenarios present a deviation of 18% above and a 12% below, respectively, the projected GVP in 2029-30 under the Central case.

Projected horticulture industry contribution

It is estimated that the total contribution (value added in horticulture industry plus induced value added in other industries) of the horticulture industry to GDP in 2030 will be \$15.85 billion, \$18.87 billion and \$13.91 billion, respectively, under the Central, High and Low scenarios (Chart 3).

3. Comparison of total horticulture contribution to GDP by scenarios

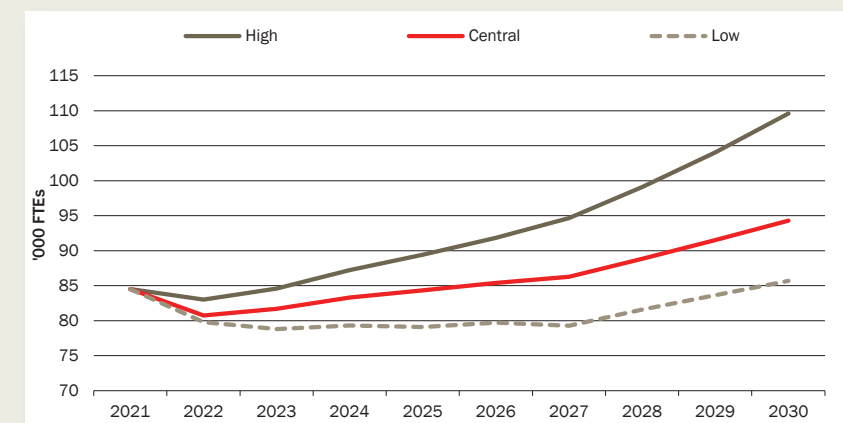


Data source: CIE modelling

Employment

It is estimated that the industry will contribute 94,286 FTEs under the Central scenario (Chart 4). The employment contribution under the High and Low scenarios presents a 16% and 9% deviation, respectively, from the Central scenario.

4. Comparison of total horticulture contribution to employment by scenario

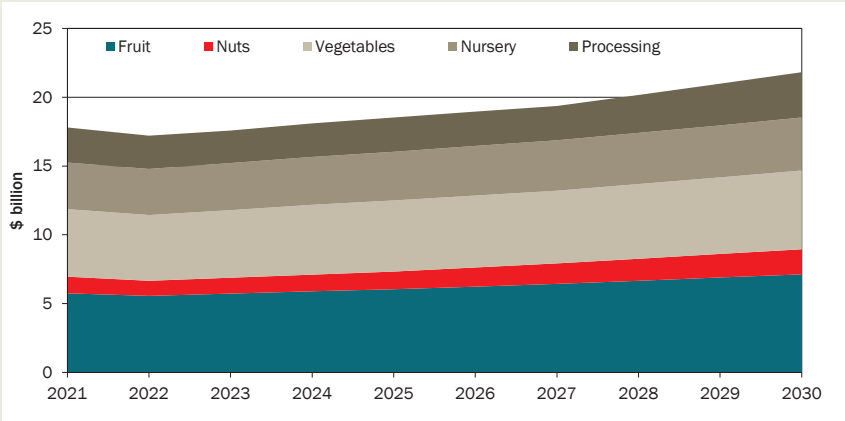


Data source: CIE modelling

Projected contribution by category

After a fall in 2021-22 due to rising input costs, horticulture GVP is projected to experience continuous growth up to 2030, with a total GVP of \$21.8 billion in real terms. Chart 5 shows the projected horticulture industry GVP by broad category under the Central scenario.

5. Projected Australian horticulture GVP by category, Central scenario

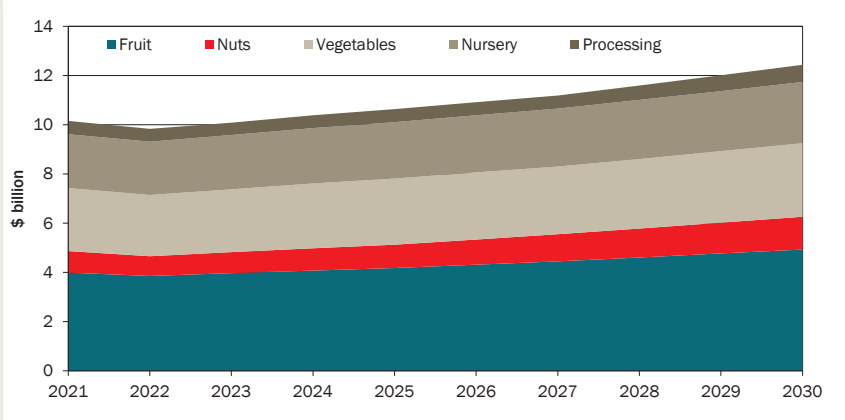


Data source: CIE modelling

Projected value added by category

Chart 6 shows the projected value added of horticulture up to 2030 under the Central scenario. The value added series follows a similar pattern to the GVP series. Following a 3.2% fall to \$9.83 billion in 2021-22, the projection is for continuous growth to \$12.44 billion in 2029-30.

6. Projected horticulture value added by broad category, Central scenario

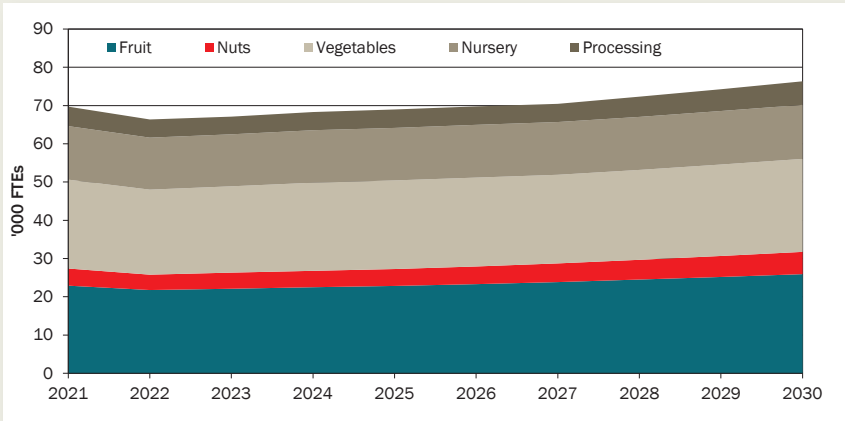


Data source: CIE modelling

Projected horticulture employment

Following a fall to 66,360 FTEs in 2021-22, total horticulture employment is projected to increase to 76,370 FTEs in 2029-30, under the Central scenario (Chart 7). The projected increase also takes into account productivity improvements: less labour required to produce the same amount of commodities.

7. Projected horticulture employment, Central scenario



Data source: CIE modelling

Projected growth by commodity

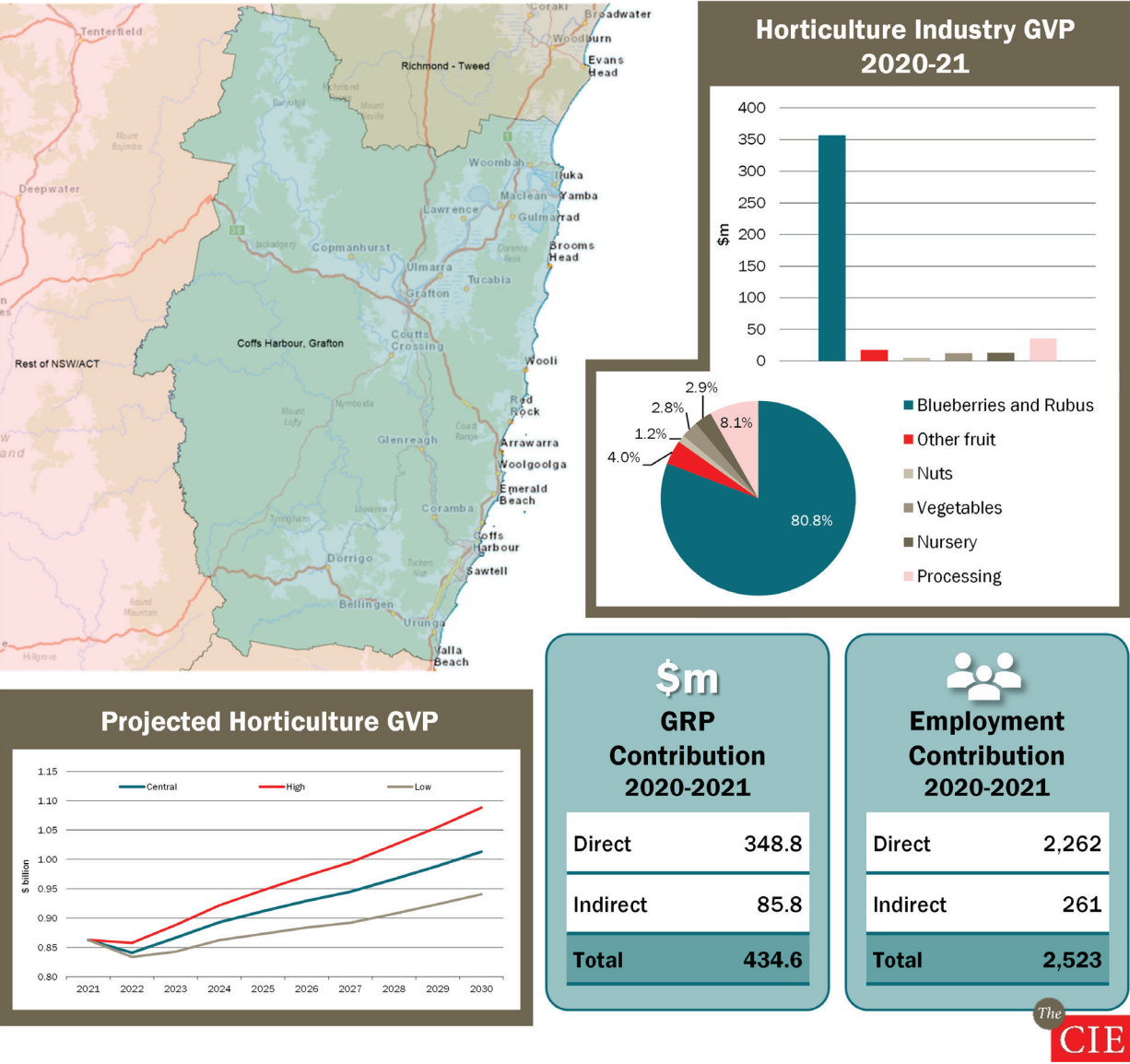
Table 8 reports the Central scenario projection of Australian horticulture production value, value added and employment in 2029-30 along with the base year levels in 2020-21, by commodity.

Compared to the base year level, nuts and some fruit commodities have the highest projected growth rates, largely due to assumed greater export opportunities.

	GVP			Value Added			Employment		
	2020-21 \$m	2029-30 \$m	Growth ^a %	2020-21 \$m	2029-30 \$m	Growth ^a %	2020-21 FTE	2029-30 FTE	Growth ^a %
Fruit									
Apples	619.9	707.4	14.1	484.1	552.4	14.1	1,818	1,863	2.5
Pears and nashis	144.9	172.0	18.7	113.1	134.3	18.7	425	457	7.4
Summer fruit	338.9	426.2	25.7	231.0	290.4	25.7	701	807	15.2
Cherries	231.3	297.4	28.6	203.7	261.8	28.6	478	566	18.4
Strawberries	417.2	482.2	15.6	247.3	285.8	15.6	2,324	2,415	3.9
Rubus	644.1	739.5	14.8	563.3	646.8	14.8	3,587	3,681	2.6
Kiwi fruit	24.4	36.9	51.2	16.8	25.4	51.2	157	223	42.0
Oranges	437.6	628.4	43.6	308.8	443.4	43.6	1,604	2,159	34.6
Mandarins	341.9	466.7	36.5	259.8	354.6	36.5	1,253	1,567	25.1
Other citrus	156.8	169.7	8.2	125.8	136.1	8.2	575	554	-3.6
Grapes - Table and Other	631.8	819.2	29.7	392.6	509.0	29.7	3,226	3,913	21.3
Grapes - Total Dried	25.3	33.4	32.1	15.7	20.8	32.1	129	162	25.1
Other temperate fruit	23.6	36.6	55.1	16.8	26.1	55.1	88	122	38.3
Bananas	596.8	680.6	14.0	360.8	411.5	14.0	2,225	2,274	2.2
Pineapples	46.8	54.8	17.0	25.7	30.1	17.0	174	180	2.9
Avocados	488.7	649.4	32.9	268.4	356.7	32.9	1,822	2,315	27.0
Mangoes	167.4	211.7	26.5	92.0	116.3	26.5	624	732	17.2
Melons	149.0	180.6	21.2	71.7	86.9	21.2	674	739	9.7
Other tropical fruit	104.7	127.7	22.0	57.5	70.2	22.0	390	423	8.2
Olives	161.2	208.4	29.3	131.1	169.5	29.3	642	743	15.8
Fruit sub-total	5,752.3	7,128.9	23.9	3,985.9	4,928.2	23.6	22,916	25,893	13.0
Nuts									
Macadamia	339.1	589.3	73.8	223.9	389.2	73.8	1,264	2,079	64.4
Almonds	721.6	1,027.8	42.4	549.6	782.8	42.4	2,690	3,153	17.2
Other nuts	135.5	209.3	54.4	104.6	161.6	54.4	505	647	28.1
Nuts sub-total	1,196.2	1,826.4	52.7	878.1	1,333.6	51.9	4,460	5,878	31.8

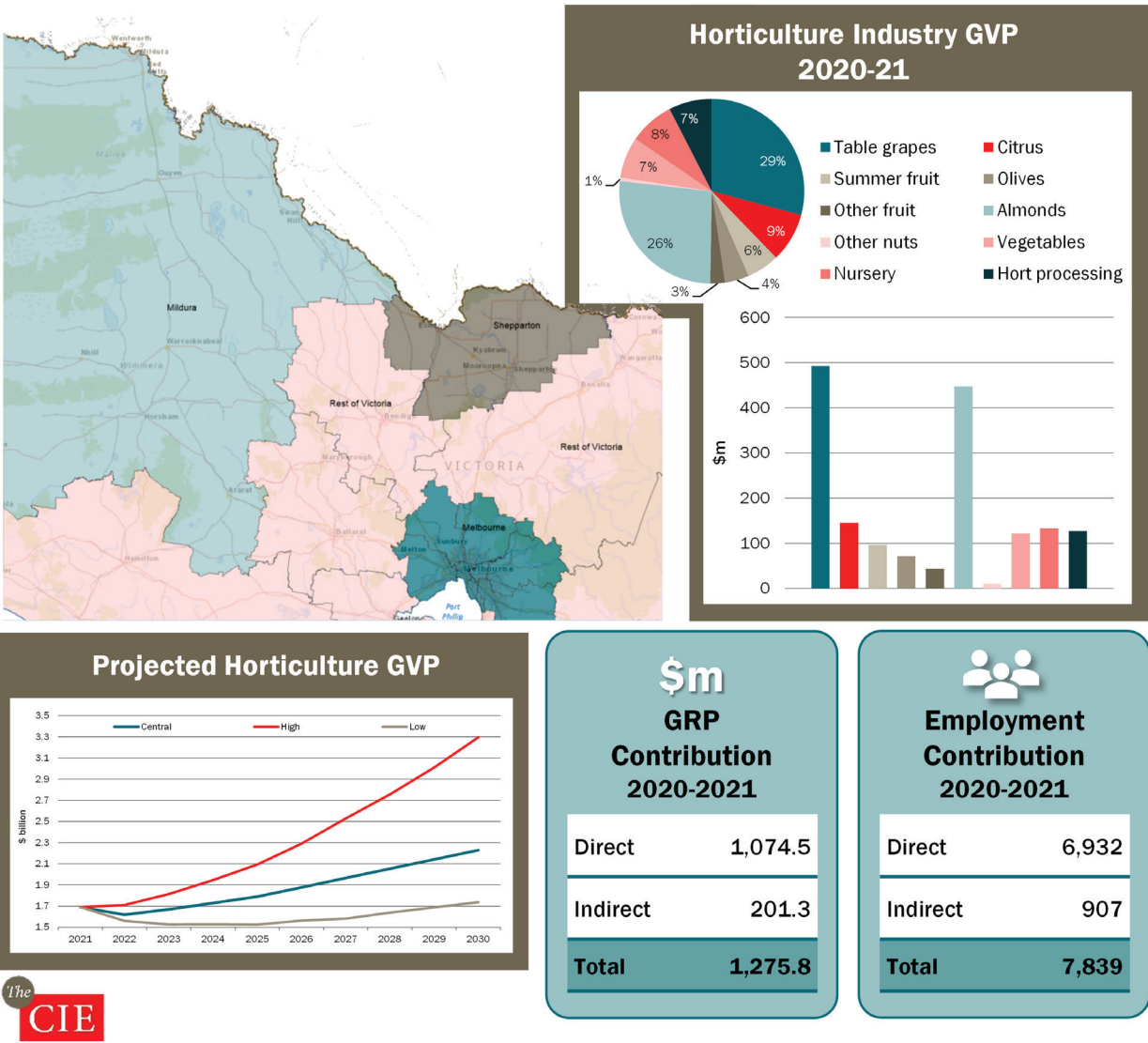
	GVP			Value Added			Employment		
	2020-21 \$m	2029-30 \$m	Growth ^a %	2020-21 \$m	2029-30 \$m	Growth ^a %	2020-21 FTE	2029-30 FTE	Growth ^a %
Vegetables									
Potatoes	807.3	957.7	18.6	480.2	569.6	18.6	3,651	3,897	6.7
Carrots	256.0	318.4	24.4	125.5	156.1	24.4	1,158	1,313	13.4
Onions	203.2	252.4	24.2	105.7	131.3	24.2	919	1,044	13.6
Pumpkins	89.4	104.4	16.7	40.2	46.9	16.7	404	418	3.5
Sweet corn	117.1	133.2	13.7	54.5	61.9	13.7	530	536	1.3
Peas and beans	143.5	164.7	14.8	103.4	118.7	14.8	649	659	1.5
Lettuce	171.9	186.9	8.7	67.5	73.4	8.7	777	751	-3.4
Broccoli	258.9	312.0	20.5	126.0	151.9	20.5	1,171	1,269	8.3
Cauliflower	63.1	71.4	13.2	32.9	37.2	13.2	285	289	1.4
Capsicums; Chillies & Peppers	206.4	233.9	13.3	105.9	120.0	13.3	933	947	1.5
Tomatoes - processing	36.1	47.1	30.5	24.7	32.2	30.5	163	185	13.0
Tomatoes - fresh	526.1	568.8	8.1	244.8	264.7	8.1	2,379	2,298	-3.4
Asparagus	81.1	101.7	25.4	71.3	89.5	25.4	367	419	14.3
Mushrooms	393.1	453.8	15.4	211.6	244.3	15.4	2,832	2,910	2.8
Garlic and herbs	259.2	301.5	16.3	155.5	180.9	16.3	1,172	1,222	4.3
Other vegetables	1,301.4	1,514.7	16.4	611.3	711.5	16.4	5,886	6,149	4.5
Vegetables sub-total	4,913.8	5,722.6	16.5	2,561.0	2,990.1	16.8	23,277	24,306	4.4
Nursery									
Nursery	2,789.5	3,165.5	13.5	1,805.0	2,048.2	13.5	9,983	9,981	0.0
Cultivated turf	308.0	352.7	14.5	216.5	247.9	14.5	1,333	1,354	1.6
Cut flowers	290.2	335.7	15.7	164.8	190.6	15.7	2,677	2,760	3.1
Nursery subtotal	3,387.7	3,853.9	13.8	2,186.2	2,486.8	13.7	13,993	14,096	0.7
Total farming	15,250.0	18,531.8	21.5	9,611.3	11,738.6	22.1	64,646	70,173	8.6
Processing									
Frozen potatoes	652.4	778.4	19.3	148.5	177.2	19.3	1,371	1,563	14.0
Canned tomatoes	243.3	317.4	30.5	55.4	72.2	30.5	511	637	24.7
Other processed vegetables	350.0	429.7	22.8	79.7	97.8	22.8	736	863	17.3
Processed fruits and jams	529.9	770.8	45.5	120.6	175.5	45.5	1,114	1,548	39.0
Orange and other juice	576.2	724.4	25.7	131.2	164.9	25.7	1,211	1,455	20.1
Olive oil	206.3	265.6	28.8	11.7	15.1	28.8	108	134	23.5
Processing subtotal	2,558.1	3,286.4	28.5	547.1	702.7	28.4	5,051	6,199	22.7
Total horticulture	17,808.1	21,818.2	22.5	10,158.3	12,441.3	22.5	69,697	76,372	9.6

Coffs Harbour and Grafton



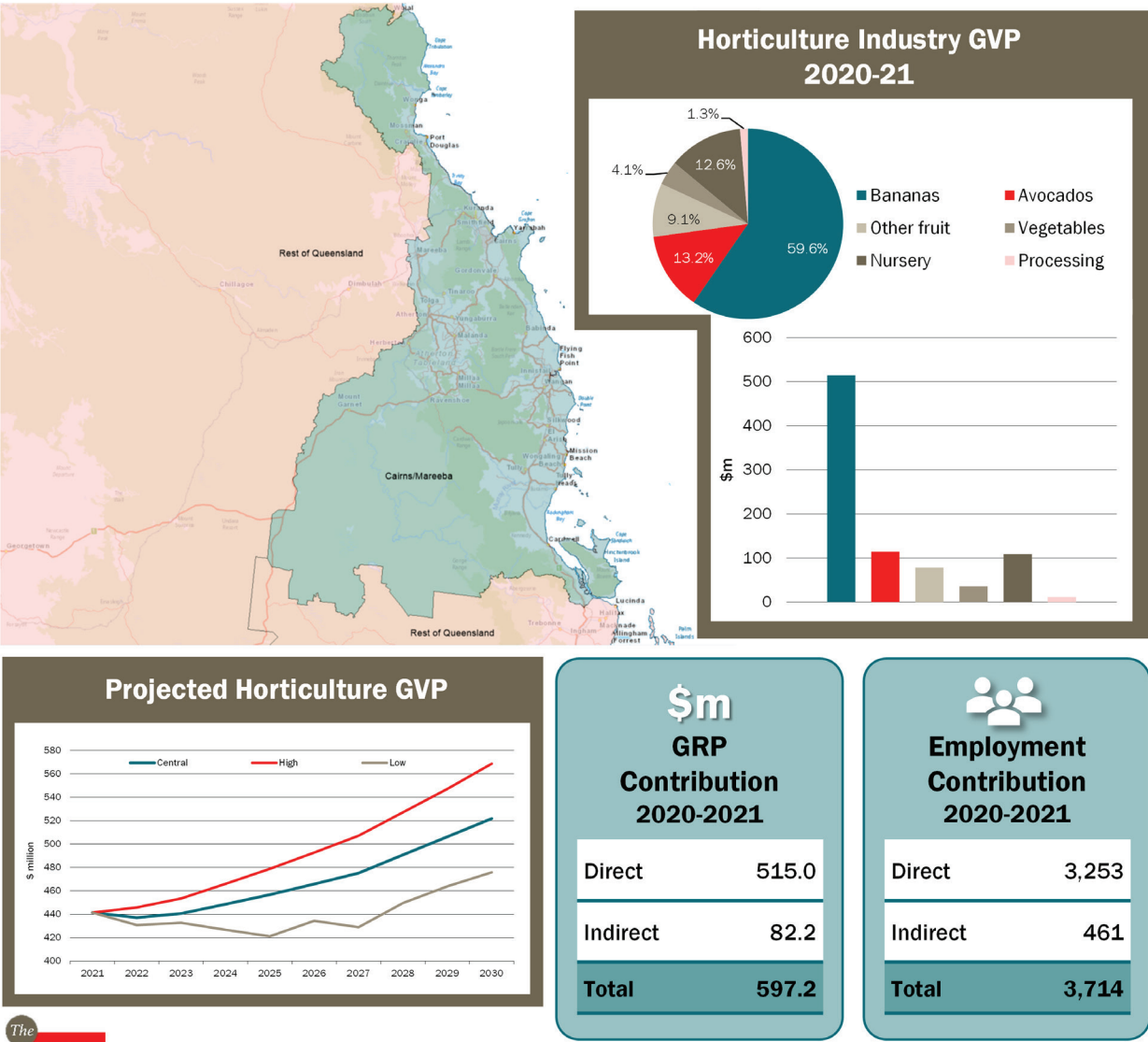
- The total value of horticulture industry in the Coffs Harbour – Grafton region was \$441 million in 2020-21, with a value added of \$349 million (3.61% of GRP).
- The industry employed 2,262 FTEs, representing 3.93% of the region's workforce. Another 261 workers were indirectly employed.
- The region produces more than half of the nation's berries (blueberries and Rubus berries).
- Berries account for about 88% of horticulture growing (excluding processing) or 81% of total horticulture (including processing) in the region.
- The horticulture industry in the region directly contributed \$349 million to the GRP and induced another \$85.8 million in GRP in 2020-21.
- The horticulture industry in the region is projected to grow by 18% to \$522 million by 2029-30 under the Central scenario, with a range from \$476 million under the Low scenario to \$569 million under the High scenario.
- Developing the export market could enhance future growth. The current dominance of berry production, which is mainly for domestic consumption, limits future export growth.
- Total (direct and indirect) contribution of the industry to GRP is projected to be \$468-550 million by 2029-30, with total employment contribution from 2,531 to 2,856 FTEs.

Mildura

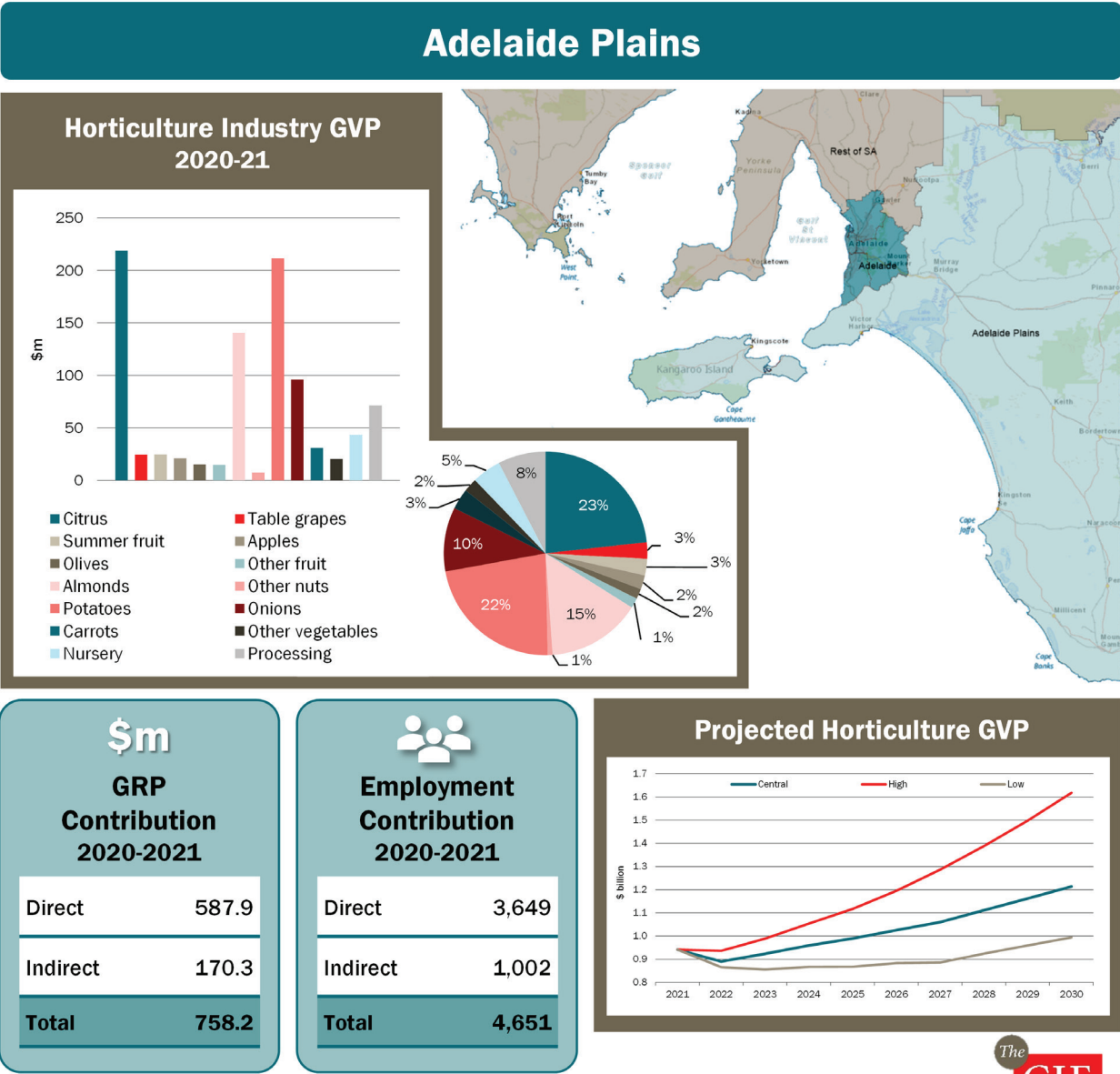


- Horticulture is a major industry in the region, with a total value of \$1.7 billion in 2020-21, and a value added of \$1.1 billion. This represents 10.1% of GRP.
- The industry employed 6,932 FTE, which represents 9.3% of the regional workforce. Another 907 workers were indirectly employed.
- The region produces 78% of the nation's table grapes and 62% of the nation's almonds.
- Table grapes and almonds are also the top two horticulture crops in the region, accounting for 29% and 27% of the horticulture industry's GVP, respectively.
- The industry directly contributed \$1.1 billion to the GRP and induced another \$201 million in GRP in 2020-21.
- The horticulture industry in this region is projected to grow by 32% to \$2.2 billion by 2029-30 under the Central scenario, with a range from \$1.7 billion under the Low scenario to \$3.3 billion under the High scenario.
- Table grapes (with an export share of 60%) and almonds (with an export share of 75%) are projected to have higher growth than the industry's average, highlighting the importance of export markets to future growth.
- Total (direct and indirect) contribution of the industry to GRP is projected to be \$1.3-2.6 billion by 2029-30, while total employment contribution is projected to be 7,757 to 13,525 FTEs.

Cairns



- The total value of horticulture industry was \$863 million in 2020-21, with a value added of \$515 million (3.2% of GRP).
- The industry employed 3,253 FTEs, representing 2.8% of the regional workforce. Another 461 workers (FTE) were indirectly employed.
- 86% of the nation's bananas are grown in this region, and bananas account for 60% of the industry's total value in this region.
- The horticulture industry in the region directly contributed \$515 million to the GRP and induced another \$82.2 million in GRP in 2020-21.
- The horticulture industry in this region is projected to grow by 26% to \$1 billion by 2029-30 under the Central scenario, with a range from \$941 million under the Low scenario to \$1.1 billion under the High scenario.
- Developing the export market could enhance future growth. The current dominance of bananas, which are grown almost exclusively for domestic consumption, limits future export growth.
- Total (direct and indirect) contribution of the industry to GRP is projected to be \$650-749 million by 2029-30 while total employment contribution is projected to be 3,780 to 4,210 FTEs.



- The total value of horticulture industry was \$941.5 million in 2020-21, with a value added of \$587.9 million (5.2% of GRP).
- The industry employed 3,649 FTEs, representing 4.5% of the regional workforce. Another 1,002 workers (FTE) were indirectly employed.
- Citrus, potatoes and almonds are the major horticultural commodities in the region, accounting for 23.2%, 22.5%, and 15% of the region’s horticulture GVP, respectively.
- The region produces almost half of the nation’s onions.
- Onions account for 10.2% of the region’s horticulture GVP.
- The horticulture industry in the region directly contributed \$587.9 million to the GRP and induced another \$170.3 million in GRP in 2020-21.
- The horticulture industry in this region is projected to grow by 29% to \$1.2 billion by 2029-30 under the Central scenario, with a range from \$1.0 billion under the Low scenario to \$1.6 billion under the High scenario.
- Total (direct and indirect) contribution of the industry to GRP is projected to be \$795 million to 1.3 billion by 2029-30, while total employment contribution is projected to be 4,683 to 7,129 FTEs.

The picture for Australian horticulture over the short to medium term is one of value and employment growth across almost all horticultural commodities. The value of the industry is projected to increase by 22.5% in the period 2020-2030 and horticultural industry employment is projected to increase by almost 10% over the same period.

While overall projected growth is 22.5%, growth projections vary considerably across commodities. Commodities focusing on the domestic market have a more subdued outlook, while those commodities with substantial export growth potential have higher growth projections.

This powerful economic model will enable the horticulture industry to comprehensively detail its current and future contribution to stakeholders, both from a whole industry or a commodity level. It has the potential to explore a range of scenarios, for example, the impact of an investment or policy decision.

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