

Chapter 3

Plant industry profiles



Image courtesy of Apple and Pear Australia

Plant industry profiles

The following pages profile plant industries that are members of Plant Health Australia, their economic value, and where the major growing regions are for each industry within the states and territories.

Graphs show trends over recent years in local value of production (LVP), which is the value of agricultural commodities at the farm gate. Note that data used in the graphs is up to 2017–18, the latest year for which the data is available.

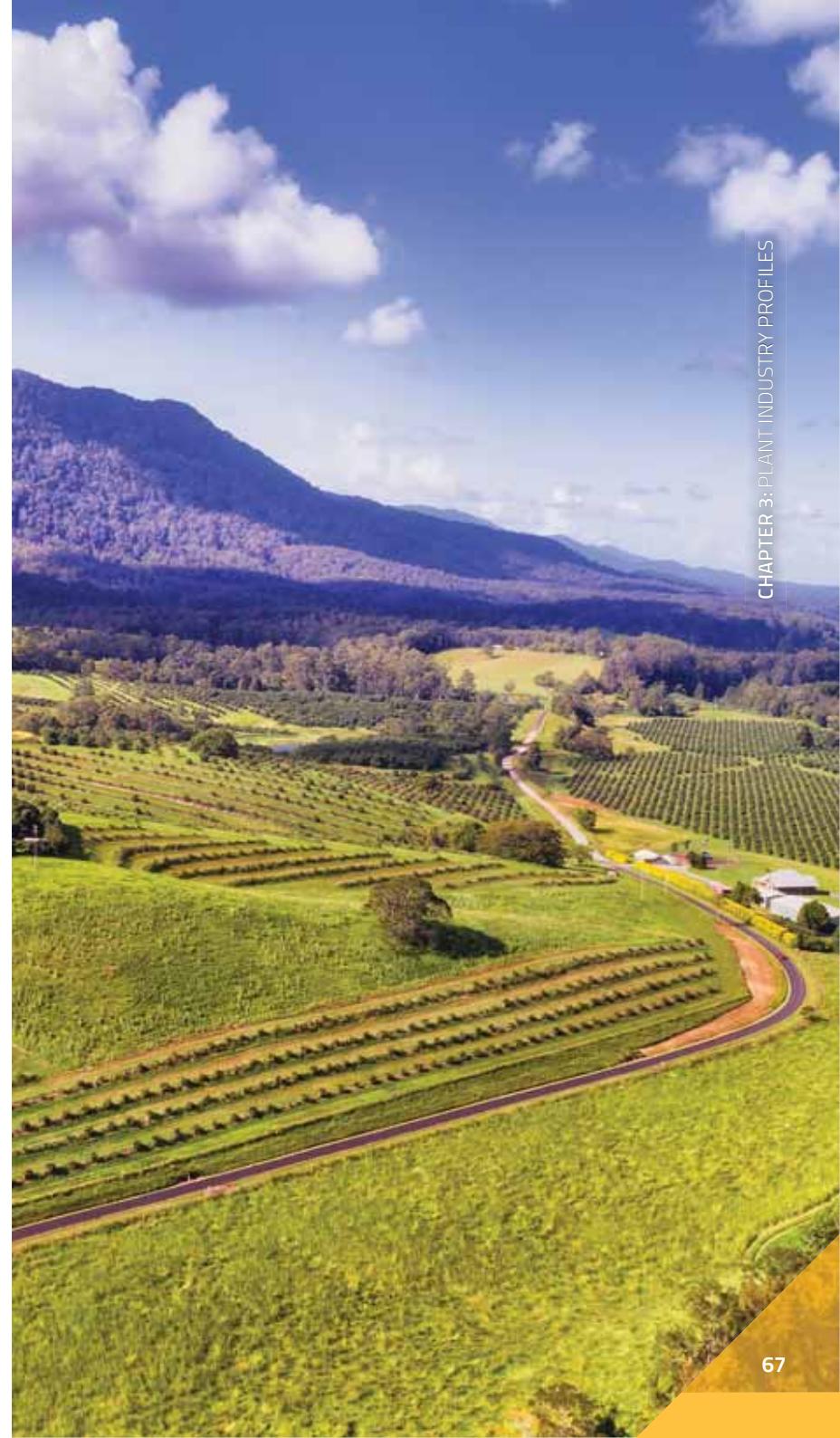
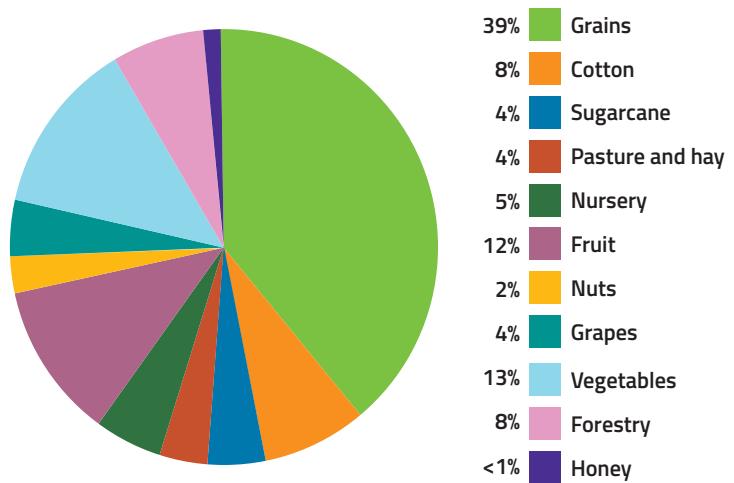
Farm gate values are sourced from approved statistical authorities such as Australian Bureau of Statistics (ABS), the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and industry sources. Export figures are sourced from the Australian Horticulture Statistics Handbook 2017–18.¹⁹

Each profile also provides details of the industry's key exotic pest threats and the biosecurity initiatives that they have undertaken in 2019. All of these industries are signatories to the Emergency Plant Pest Response Deed, apart from the Australian Blueberry Growers' Association and Passionfruit Australia.

Figure 7 shows the contribution of each of the main plant production industries (including honey and beeswax) to total plant gross value of production in 2017–18 (the latest year for which this breakdown is available).^{20 21}

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19. Hort Innovation (2019). Australian Horticulture Statistics Handbook 2017–18. Accessed online 12 February 2020
 20. Australian Bureau of Agricultural and Resource Economics and Sciences. Agricultural Commodities March Quarter 2020– Statistics. Accessed online 21 April 2020. agriculture.gov.au/abares/research-topics/agricultural-commodities/mar-2020
 21. Australian Bureau of Statistics 7503.0 - Value of Agricultural Commodities Produced, Australia, 2017-18. Accessed online 21 April 2020. abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/7503.02017-18?OpenDocument

Figure 7. Comparative value of Australia's plant production industries, based on gross value of production, 2017–18



ALMONDS

Represented by the Almond Board of Australia
australianalmonds.com.au

In 2017–18, almond production was valued at \$441 million (LVP), with exports valued at \$440 million.

The domestic market for almonds continues to grow strongly at around 10 per cent per year due to an increasing move to plant-based diets and the health benefits of nuts. The industry has focused on export market development, with three tonnes of almonds being shipped overseas for every tonne consumed in Australia. Historically, India has been the largest export market, but sales to China continue to increase rapidly, making it the major destination for Australian almonds.

The industry has been expanding rapidly since 2016 with an additional 20,000 hectares being planted, bringing the total industry orchard area to 50,000 hectares. The orchards are concentrated along the Murray Valley in Victoria (53%), SA (21%), and NSW (24%), with an orchard in WA (2%).

The 2019 production was 104,000 tonnes, however when current plantings reach full maturity the industry's productive capacity will be approximately 160,000 tonnes.

Nonpareil continues to be the most popular variety with several pollinator varieties such as Carmel, Price and Monterey planted to overlap the flowering period of Nonpareil to achieve good nut set.

The Australian almond industry depends on honey bees for pollination with more than 200,000 hives required during the pollination season. The almond blossoms provide one of the first natural sources of food for bees each spring.

Table 8. High Priority Pests of the almond industry

Scientific name	Common name
<i>Amyelois transitella</i>	Navel orangeworm
<i>Chinavia hilaris</i> (syn. <i>C. hilare</i>)	Green stink bug
<i>Leptoglossus clypealis</i>	Leaf footed bug
<i>Leptoglossus occidentalis</i>	Western conifer seed bug
<i>Leptoglossus zonatus</i>	Western leaf footed bug
<i>Trogoderma granarium</i>	Khapra beetle
<i>Tropilaelaps clareae</i>	Tropilaelaps mite
<i>Tropilaelaps mercedesae</i>	Tropilaelaps mite
<i>Varroa destructor</i>	Varroa mite
<i>Verticillium dahliae</i> (exotic defoliating strain)	Verticillium wilt
<i>Xylella fastidiosa</i> (including <i>X. fastidiosa</i> subsp. <i>fastidiosa</i> , <i>X. fastidiosa</i> subsp. <i>multiplex</i> , <i>X. fastidiosa</i> subsp. <i>piercei</i>) (with vector)	Almond leaf scorch, pecan bacterial leaf scorch



Image courtesy of Michael Holmes

Figure 8. Annual value of almond production, 2007–18

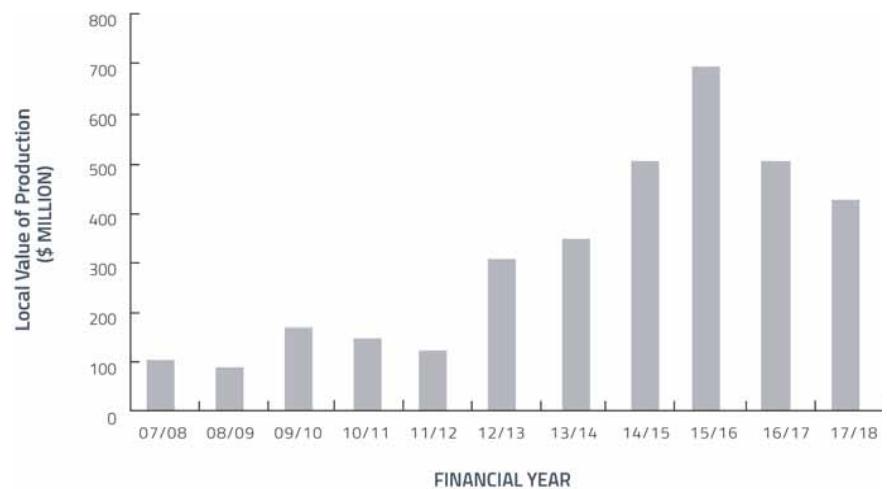
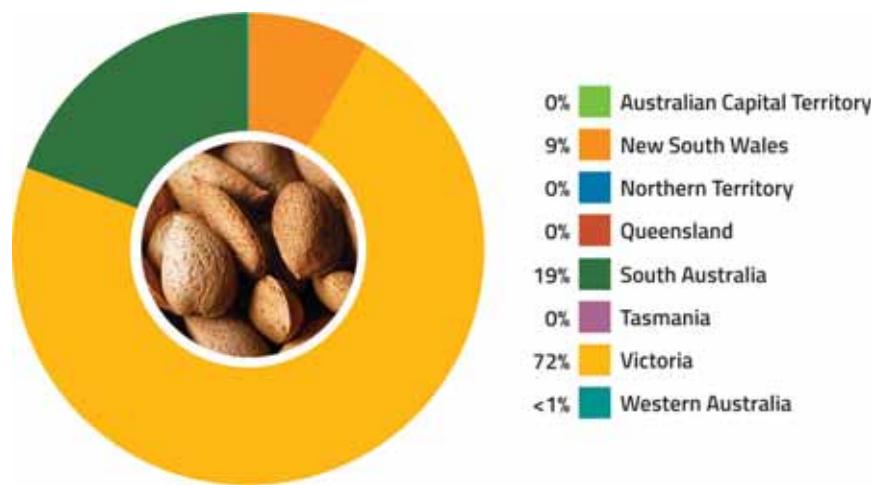


Figure 9. Distribution of almond production by state and territory, 2017–18 (based on LVP)



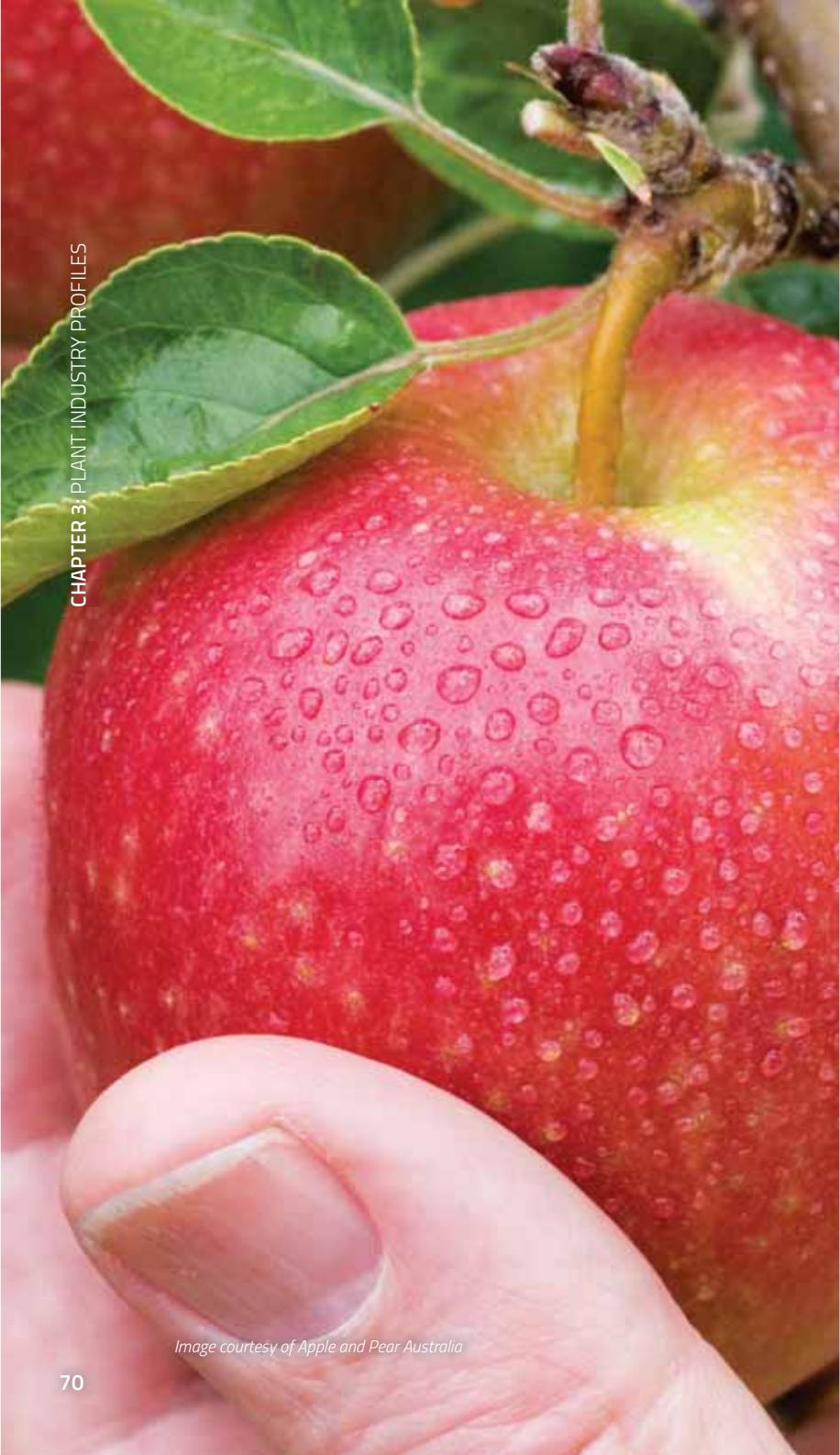


Image courtesy of Apple and Pear Australia

APPLES AND PEARS

Represented by Apple and Pear Australia
apal.org.au

In 2017–18, apple and pear production was valued at \$494 million (LVP), with exports valued at \$31 million. The total planted area was 9,375 hectares for apples and 3,175 hectares for pears.

There are approximately 550 commercial apple and/or pear grower businesses in Australia. Victoria produces 46 per cent of Australia's apples and 88 per cent of pears, with the remainder of the gross production divided evenly across the remaining states.

The major production areas include the Goulburn Valley, Gippsland, Yarra Valley and the Mornington Peninsula in Victoria; Stanthorpe in Queensland; Batlow and Orange in NSW; the Huon Valley and Tamar Valley in Tasmania; the Adelaide Hills in SA; and Donnybrook, Manjimup and the Perth Hills in WA.

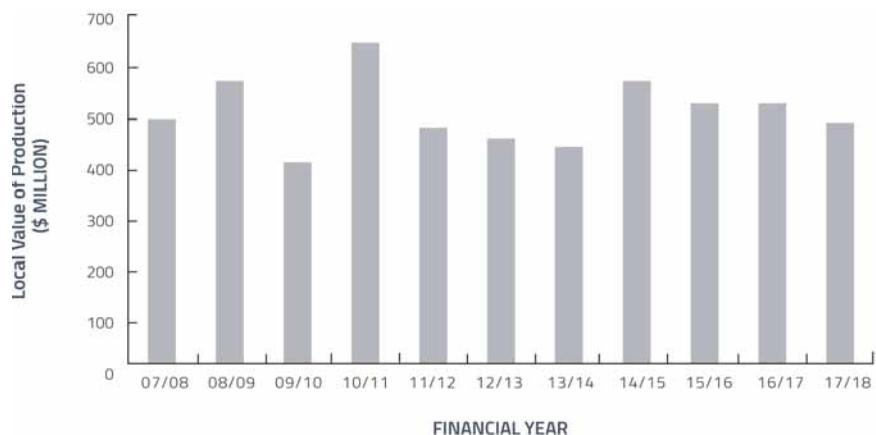
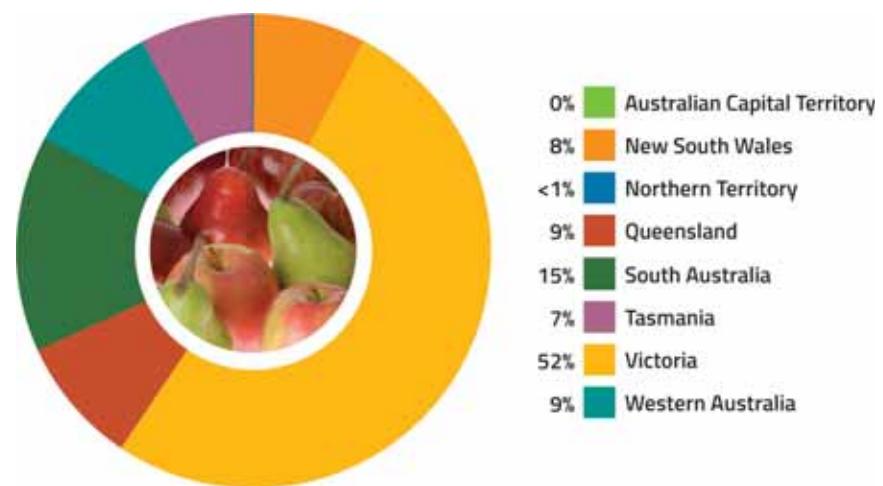
The four most common apple cultivars are Cripps Pink (Pink Lady™), Gala, Fuji and Granny Smith. Areas of Cripps Red (Sundowner™), Red Delicious and Golden Delicious are declining. A number of newer club apples such as Jazz™, Kanzi™, Envy™, Smitten™, Rockit™ and Bravo™ have been increasing in production recently. Australia's main apple export markets are Europe, Papua New Guinea, Hong Kong and Indonesia.

Packham and Williams are the most common pear cultivars grown, plus smaller areas of Beurre Bosc and Corella. New cultivars include ANP-0118 (Lanya™), ANP-0131 (Rico™), and Piqa Boo™. The main pear export markets are New Zealand, Indonesia, Canada and Singapore.



Table 9. High Priority Pests of the apple and pear industry

Scientific name	Common name
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Carposina sasakii</i>	Peach fruit moth, small peach fruit borer
<i>Cydia inopinata</i> (syn. <i>Grapholita inopinata</i>)	Manchurian fruit moth
<i>Dasineura mali</i>	Apple leaf curling midge
<i>Drosophila suzukii</i>	Spotted wing drosophila
<i>Dysaphis plantaginea</i>	Rosy apple aphid
<i>Erwinia amylovora</i>	Fire blight
<i>Halyomorpha halys</i>	Brown marmorated stink bug
<i>Lymantria dispar</i>	Asian gypsy moth
<i>Lymantria mathura</i>	Rosy gypsy moth, pink gypsy moth
<i>Lymantria monacha</i>	Nun moth
<i>Monilinia fructigena</i>	Brown rot
<i>Monilinia mali</i>	Monilinia leaf blight, blossom wilt
<i>Monilinia polystroma</i> (syn. <i>Monilia polystroma</i>)	Asiatic brown rot
<i>Neonectria ditissima</i> (syn. <i>N. galligena</i> and <i>Nectria galligena</i>)	European canker
<i>Rhagoletis pomonella</i>	Apple maggot
<i>Tropilaelaps clareae</i>	Tropilaelaps mite
<i>Tropilaelaps mercedesae</i>	Tropilaelaps mite
<i>Varroa destructor</i>	Varroa mite

Figure 10. Annual value of apple and pear production, 2007–18**Figure 11. Distribution of apple and pear production by state and territory, 2017–18 (based on LVP)**

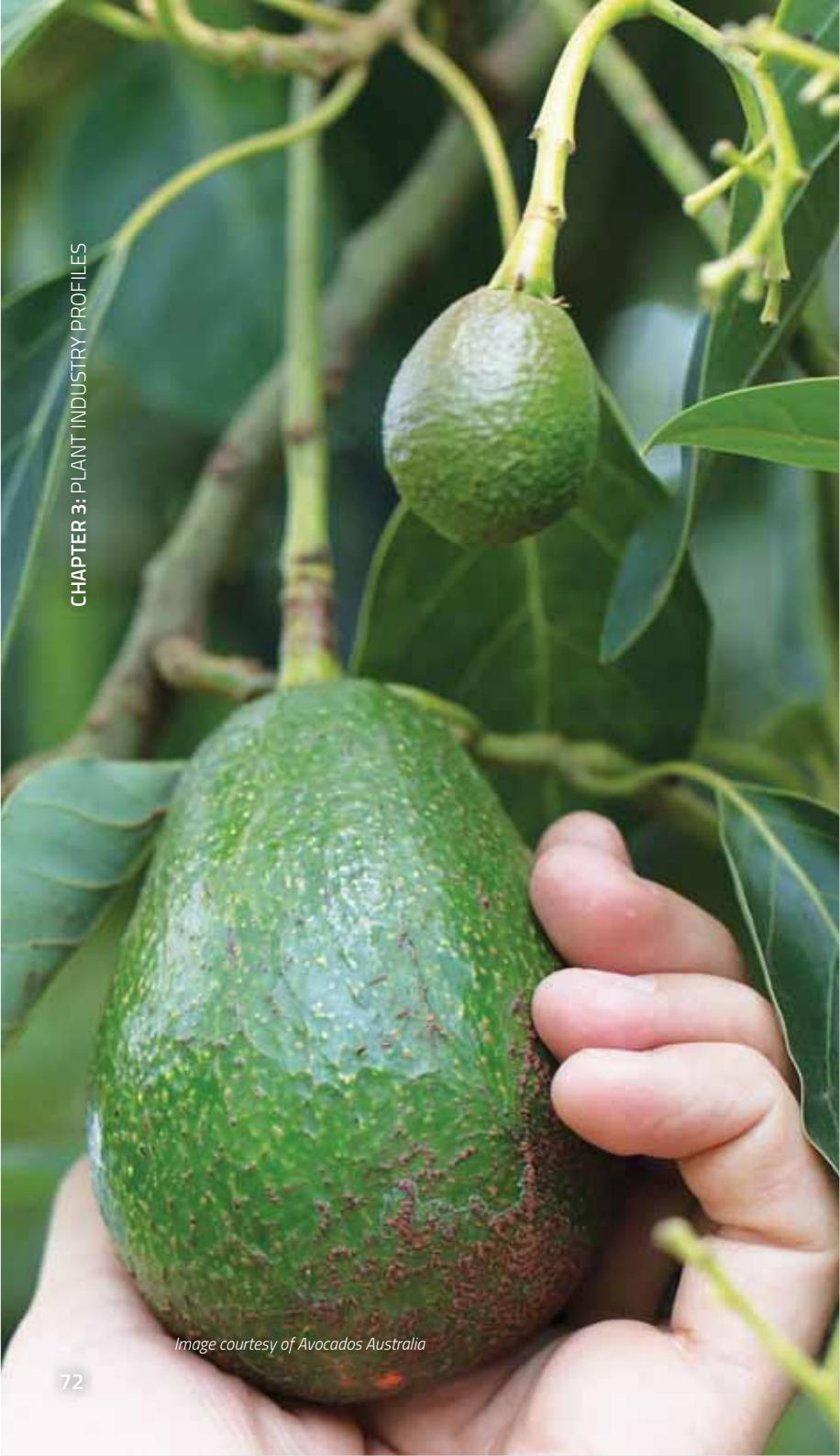


Image courtesy of Avocados Australia

AVOCADOS

Represented by Avocados Australia
avocado.org.au

In 2017–18, avocado production was valued at \$350 million (LVP), with exports valued at \$11.6 million, which were mainly shipped to Malaysia and Singapore.

Australians' love of avocados has grown steadily each year since the 1990s. Consumption in 2018–19 reached 3.8 kilograms per person, up from 1.2 kilograms in 1997–98.

Queensland dominates Australia's avocado production, followed by WA, NSW, SA and Victoria, with a small amount of production in Tasmania and one known orchard in the NT. This geographic diversity in growing regions ensures domestic access to Australian avocados year-round. Fruit imported from New Zealand supplements supply during spring and summer.

The Hass variety is the predominant avocado produced in Australia, accounting for approximately 81 per cent production, with Shepard accounting for about 16 per cent. Other varieties such as Reed, Sharwil, Gwen, Wurtz and Fuerte make up the balance.



Avocado leaf and flower spike. Image courtesy of Avocados Australia

Table 10. High Priority Pests of the avocado industry

Scientific name	Common name
Avocado sunblotch viroid (asymptomatic strains)	Avocado sunblotch
Avocado sunblotch viroid (symptomatic strains)	Avocado sunblotch
<i>Bactrocera carambolae</i>	Carambola fruit fly
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Bactrocera facialis</i>	Tropical fruit fly, Tongan fruit fly
<i>Bactrocera kandiensis</i>	Fruit fly
<i>Bactrocera kirki</i>	Fijian fruit fly
<i>Bactrocera melanotus</i>	Fruit fly, Cook Islands fruit fly
<i>Bactrocera passiflorae</i>	Fijian fruit fly
<i>Bactrocera xanthodes</i>	Pacific fruit fly
<i>Conotrachelus aguacatae</i>	Small avocado seed weevil
<i>Conotrachelus perseae</i>	Small seed weevil
<i>Erwinia herbicola</i> (exotic strains)	Avocado blast
<i>Heilipus lauri</i>	Large seed weevil
<i>Oligonychus persea</i>	Persea mite
<i>Phytophthora kernoviae</i>	Phytophthora blight
<i>Phytophthora mengei</i>	Trunk canker
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Pseudomonas syringae</i> pv. <i>syringae</i> (exotic races)	Bacterial canker
<i>Raffaelea lauricola</i>	Laurel wilt
<i>Scirtothrips perseae</i>	Avocado thrips
<i>Sphaceloma perseae</i>	Avocado scab
<i>Stenoma catenifer</i>	Avocado seed moth
<i>Xanthomonas campestris</i> (avocado strain)	Bacterial canker
<i>Zeugodacus curcurbitae</i> (syn. <i>Bactrocera cucurbitae</i>)	Melon fruit fly

Figure 12. Annual value of avocado production, 2007–18

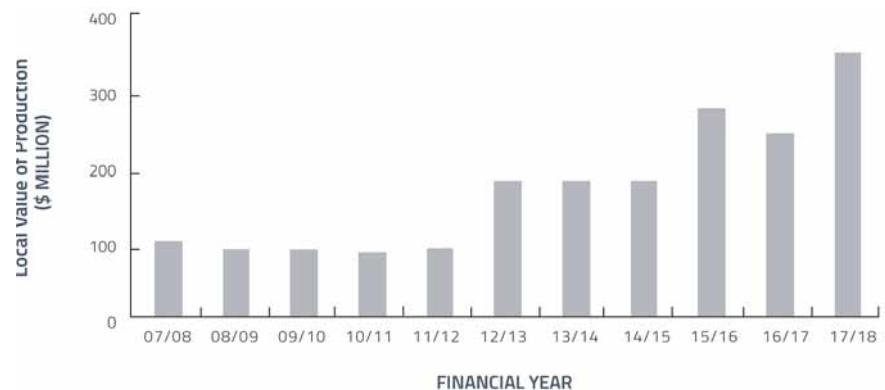
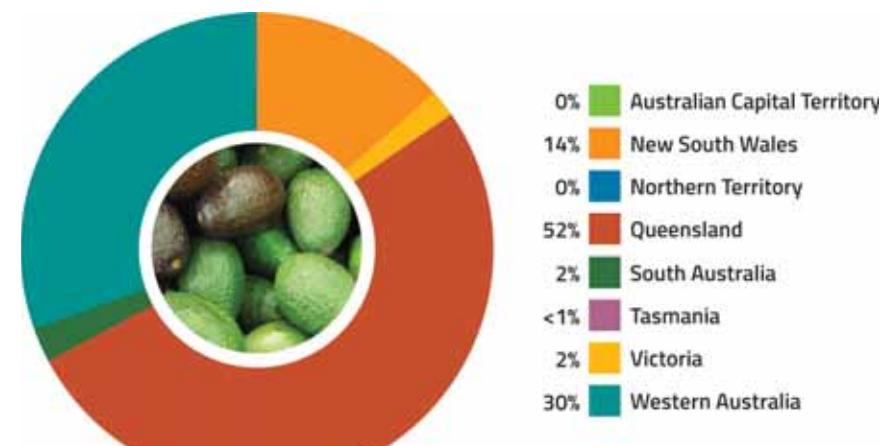


Figure 13. Distribution of avocado production by state and territory, 2017–18 (based on LVP)



BANANAS

Represented by the Australian Banana Growers' Council (ABGC)
abgc.org.au

In 2017–18, banana production was valued at \$434 million (LVP). The vast majority of the Australian banana crop is supplied to the domestic market while a small number of growers are creating export markets in Asia.

Bananas are grown commercially in Queensland, NSW, WA and NT. There are currently about 13,000 hectares of bananas grown in Australia, 94 per cent of which are located in four north Queensland growing regions: Tully, Innisfail, Lakeland and the Atherton Tablelands. Bananas are grown all year round with the two main varieties being Cavendish and Lady Finger. The Cavendish variety accounts for 95 per cent of production.

In 2019 there were two major biosecurity threats challenging the banana industry:

- Panama disease tropical race 4 (TR4) in north Queensland
- banana bunchy top virus in northern NSW and south-east Queensland.

Panama disease tropical race 4 was first detected on a north Queensland banana farm in March 2015. Due to the collaborative efforts of banana growers, the ABGC and the Queensland Department of Agriculture and Fisheries (QDAF), by the end of 2019, the disease was contained to three farms in the Tully Valley. While the plants on the original infected property were destroyed and all farming operations ceased, the other two quarantined farms continue to produce and pack fruit under strict biosecurity conditions. Biosecurity Queensland continues to conduct surveillance on all medium and high-risk commercial banana farms in north Queensland. The ABGC and QDAF are working collaboratively to determine how the Panama TR4 Program will function into the future.

A control program for banana bunchy top virus has been operating in NSW and south-east Queensland since 2009. The ABGC is delivering Phase 4 of the project to contain the virus to a limited area through targeted surveillance and destruction of infected plant material to suppress the incidence of bunchy top disease on commercial farms. The project also aims to increase the responsibility of growers to manage their own bunchy top disease on farms.

In addition to these major biosecurity threats, ABGC is active in other biosecurity programs. Yellow Sigatoka is an important endemic leaf disease that spreads easily if not controlled and causes significant production losses. An officer is employed by the ABGC to undertake inspections for the presence of yellow Sigatoka and other banana diseases in the north Queensland commercial production area and work with growers to assist them to control the disease.

The ABGC also employs two staff members who have a combined responsibility for coordinating biosecurity related research and development as well as strategy development and implementation.

Table 11. High Priority Pests of the banana industry

Scientific name	Common name
<i>Abaca bunchy top virus</i> (Babuvirus)	Abaca bunchy top virus
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Banana bunchy top virus</i> (Babuvirus) (Asian subgroup)	Bunchy top
<i>Dysmicoccus neobrevipes</i>	Grey pineapple mealybug
<i>Erionota thrax</i>	Banana skipper butterfly
<i>Frankliniella invasor</i>	Thrips
<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> (exotic vegetative compatibility groups)	Fusarium wilt, Panama disease
<i>Lissachatina fulica</i> (syn. <i>Achatina fulica</i>)	Giant African snail
<i>Mycosphaerella eumusae</i>	Eumusae leaf spot
<i>Phyllosticta</i> spp. including <i>P. cavendishii</i> , <i>P. sydowiana</i>	Banana freckle
<i>Pseudocercospora fijiensis</i> (syn. <i>Mycosphaerella fijiensis</i>)	Black Sigatoka
<i>Pseudococcus jackbeardsleyi</i>	Jack Beardsley mealybug
<i>Ralstonia solanacearum</i> phylotype IIB (banana infecting strains)	Moko
<i>Ralstonia syzygii</i> subsp. <i>celebesensis</i> (syn. <i>R. solanacearum</i> race 2, biovar 1)	Blood disease
<i>Rastrococcus invadens</i>	Mango mealybug
<i>Rastrococcus spinosus</i>	Mango mealybug
<i>Teranychus piercei</i>	Spider mite

Figure 14. Annual value of banana production, 2007–18

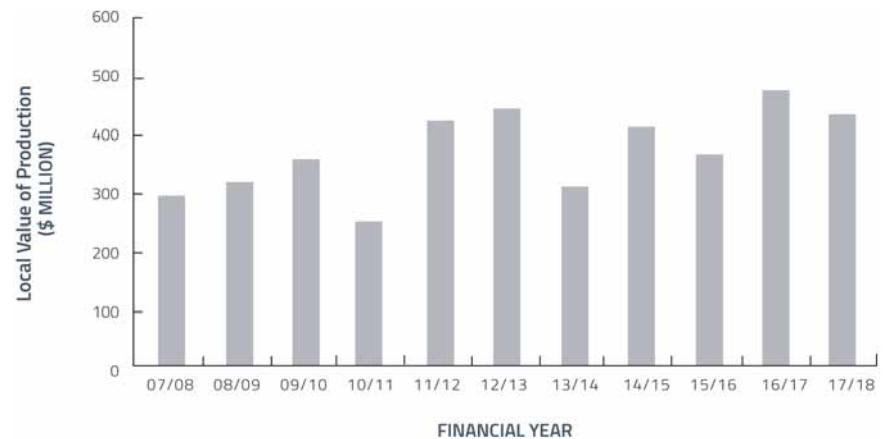
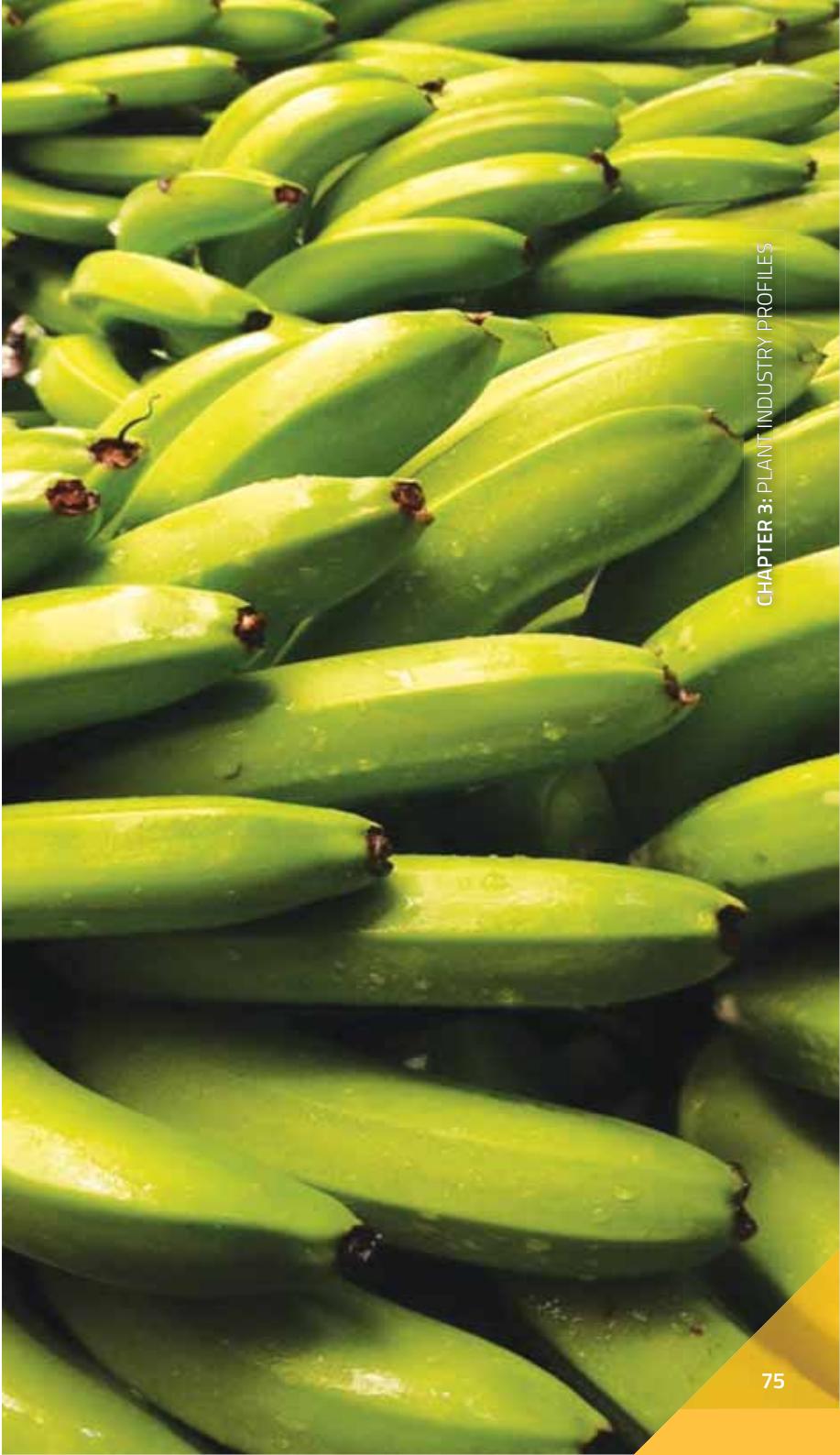
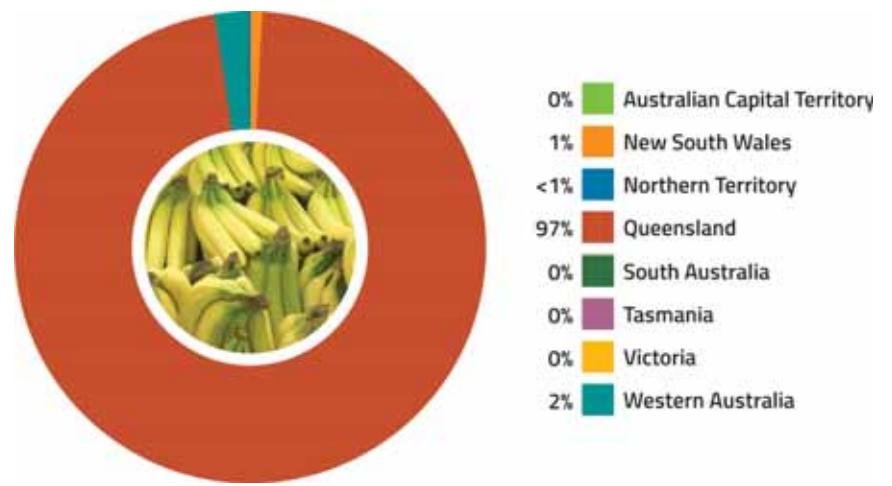


Figure 15. Distribution of banana production by state and territory, 2017–18 (based on LVP)



BLUEBERRIES

Represented by the Australian Blueberry Growers' Association

abga.com.au

In 2017–18, blueberry production was valued at approximately \$244 million (LVP). The industry is expanding, with an average 15,000 tonnes of blueberries being produced per annum. The majority of blueberries are consumed domestically, with less than five per cent exported to markets including Hong Kong, Singapore and Thailand.

Around 300 growers produce blueberries on more than 2,500 hectares in all states. The major production area is on the NSW north coast. NSW produced around 70–75 per cent of the Australian crop in 2018. Other regions have increased plantings to take advantage of late and early season fruit, with the aim of having Australian blueberries available all year-round.

The crop is grown on the NSW north coast and Tumbarumba in southern NSW; the Atherton Tablelands, Bundaberg and Mundubbera in Queensland; the Tamar Valley, Meander Valley, Bernie, Devonport and the Huon Valley in Tasmania; the Grampians, Silvan and Strathbogie in Victoria; Margaret River and Geraldton in WA; and the Mount Lofty ranges in SA.

There are three varieties of blueberries grown in Australia: northern highbush, southern highbush and rabbiteye. Northern highbush are grown in the cooler climate areas such as Victoria, Tasmania and the southern highlands of NSW, whereas southern highbush and rabbiteye varieties are grown in NSW and Queensland.

Table 12. High Priority Pests of the blueberry industry

Scientific name	Common name
<i>Croesia curvalana</i>	Blueberry leaftarter
<i>Drosophila suzukii</i>	Spotted wing drosophila
<i>Ericaphis fimbriata</i> (with blueberry scorch Carlavirus)	Blueberry aphid
<i>Homalodisca vitripennis</i> (with <i>Xylella fastidiosa</i>)	Glassy winged sharpshooter
<i>Monilinia fructigena</i>	Brown rot
<i>Monilinia vaccinii-corymbosi</i>	Mummy berry, cotton ball disease
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Xylella fastidiosa</i> (subsp. not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald

Figure 16. Annual value of blueberry production, 2011–18

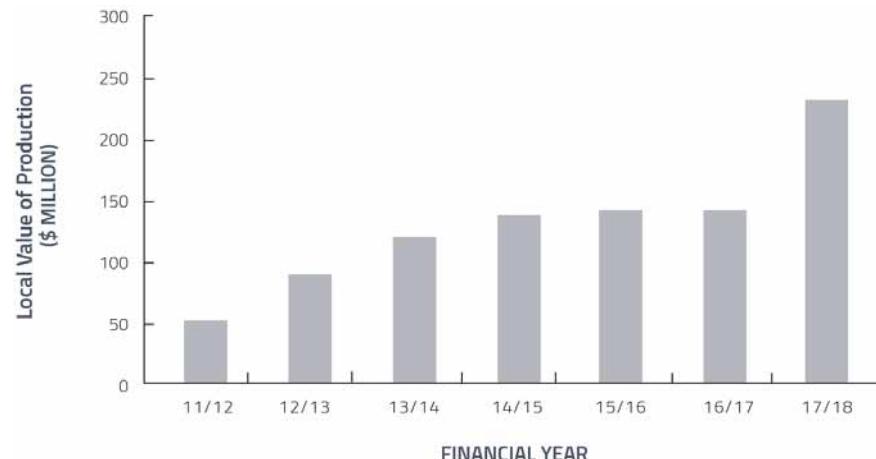


Figure 17. Distribution of blueberries production by state and territory, 2017–18 (based on LVP)



CANNED FRUITS

Represented by the Canned Fruits Industry Council of Australia
fgv.com.au

In 2017–18 production of canned fruit was valued at \$19.3 million (LVP), with exports valued at \$6.7 million.

Fruit production of the varieties represented by Canned Fruits Industry Council of Australia (apples, apricots, peaches, pears and plums) occurs from December to May, with volumes of 35,000 to 40,000 tonnes processed annually.

The industry represents more than 110 fruit growing businesses and one processor.

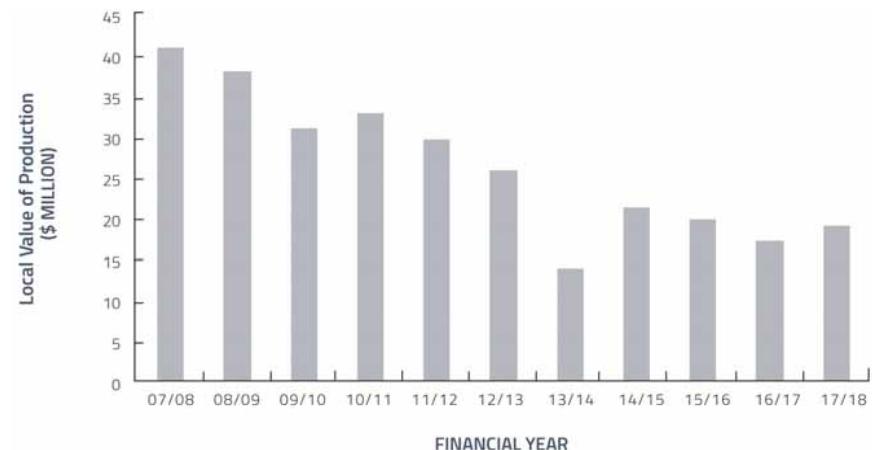
The canned deciduous fruit business is primarily based in the Goulburn-Murray Valley region of Victoria, processing Australian apples, apricots, peaches, pears and plums at Shepparton.

The canned fruits industry does not have a specific biosecurity plan or manual but has developed plans and manuals for the pome fruit (apple and pear) and stone fruit (summerfruit) industries with PHA and governments.



Image courtesy of the Canned Fruits Industry Council of Australia

Figure 18. Annual value of canned fruit production, 2007–2018



**Figure 19. Distribution of canned fruit production by state and territory, 2017–18
(based on LVP)**



CHERRIES

Represented by Cherry Growers Australia
cherrygrowers.org.au

In 2017–18 production of cherries was valued at \$159 million (LVP), and exports were valued at \$62.2 million. National production in 2018–19 reached approximately 16,000 tonnes, of which 32 per cent was exported. Production is expected to rise to 20,000 tonnes by 2020, with up to 50 per cent exported.

Cherries are produced in six states, with NSW, Victoria and Tasmania being the three largest producers, followed by SA. These four states have a strong export focus. WA and Queensland are relatively small producers, primarily focusing on the domestic market. Australian cherries are available from mid to late October until late February. The window of supply in each region is determined by the varieties grown and the local climate.

The cherry industry is increasing its production and moving into new areas. Recent market access to key Free Trade Agreement markets such as China and Vietnam have given mainland growers an unprecedented opportunity which until now has been the exclusive domain of Tasmania with its fruit fly free status. As of 1 January 2019, every major market serviced by Australian cherries, except India, will be tariff free.

This improved market access has resulted in an increase in the number of growers registering for export over the past two years, with approximately 90 growers (greater than 2,000 hectares) registered for protocol markets. National expansion is underpinned by ongoing research and strong biosecurity principles.

Table 13. High Priority Pests of the cherry industry

Scientific name	Common name
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Drosophila suzukii</i>	Spotted wing drosophila
<i>Halyomorpha halys</i>	Brown marmorated stink bug
<i>Homalodisca vitripennis</i> (syn. <i>H. coagulata</i>)	Glassy winged sharpshooter
<i>Monilinia fructigena</i>	Brown rot
<i>Neonectria ditissima</i> (syn. <i>N. galligena</i> and <i>Nectria galligena</i>)	European canker
<i>Planotortrix octo</i>	Greenheaded leaf roller
<i>Plum pox virus</i> (Potyvirus)	Plum pox virus, sharka
<i>Xylella fastidiosa</i> (subsp. not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald

Figure 20. Annual value of cherry production, 2007–18

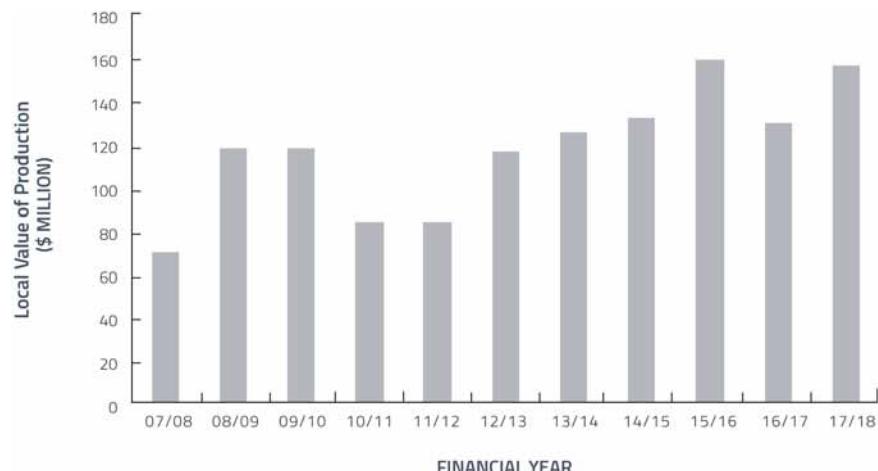
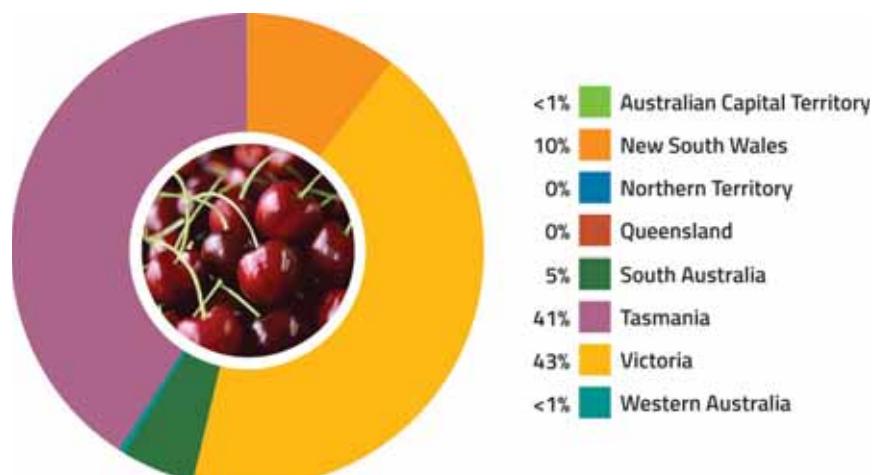


Figure 21. Distribution of cherry production by state and territory, 2017–18 (based upon LVP)



CHESTNUTS

Represented by Chestnuts Australia
chestnutaustralia.com.au

In 2017–18 chestnut production was valued at \$9.4 million (LVP).

Around 1,480 hectares are planted with 275,000 chestnut trees. In 2019, approximately 1,100 tonnes of chestnuts were produced. It is estimated that with more trees being planted in NSW, production will increase to approximately 1,300 tonnes with a value of \$12 million by 2021. The industry is primarily focused on the domestic market with approximately two per cent exported, mainly to Asian markets.

The main varieties grown are Red Spanish, Purton's Pride and De Coppi Marone. Chestnuts flower during November and December and are harvested from March through to May, and are grown primarily in Victoria and NSW.

Throughout 2019, Chestnuts Australia continued to participate in the Emergency Plant Pest Response for chestnut blight, including sitting on the chestnut blight decision-making committees, the Consultative Committee on Emergency Plant Pests and the National Management Group. More about the response to chestnut blight is in Chapter 6.

The Australian chestnut industry is fortunately free from major exotic insect pests such as the chestnut gall wasp and chestnut weevil.

Chestnuts Australia includes biosecurity as an integral part of its activities. Biosecurity is considered in the Australian Chestnut Industry Five Year Strategic Plan – 2015 to 2020 and is covered by the risk analysis documented in the tree nut industry biosecurity plan. A biosecurity section is maintained in the industry section of the Chestnuts Australia website. The industry has regular representation at PHA meetings and the Australian Government's Biosecurity Roundtables.

Table 14. High Priority Pests of the chestnut industry

Scientific name	Common name
<i>Cryphonectria parasitica</i>	Chestnut blight
<i>Dryocosmus kuriphilus</i>	Oriental chestnut gall wasp
<i>Lymantria dispar</i>	Gypsy moth (Asian and European strains)
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Verticillium dahliae</i> (exotic defoliating strains)	Verticillium wilt

Figure 22. Annual value of chestnut production, 2009–18

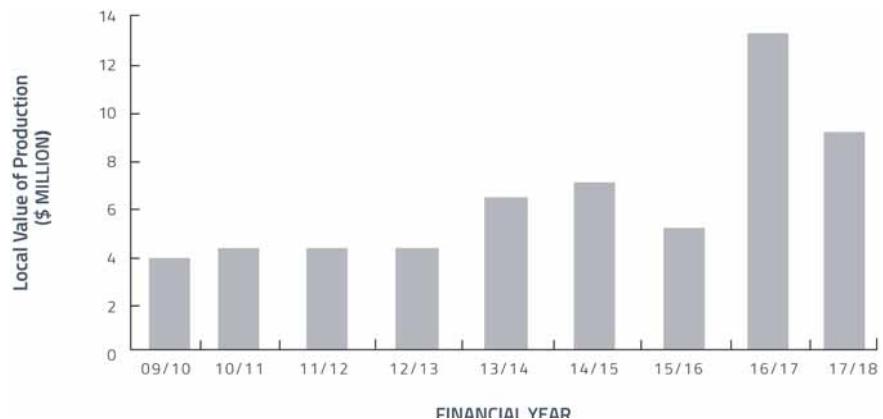
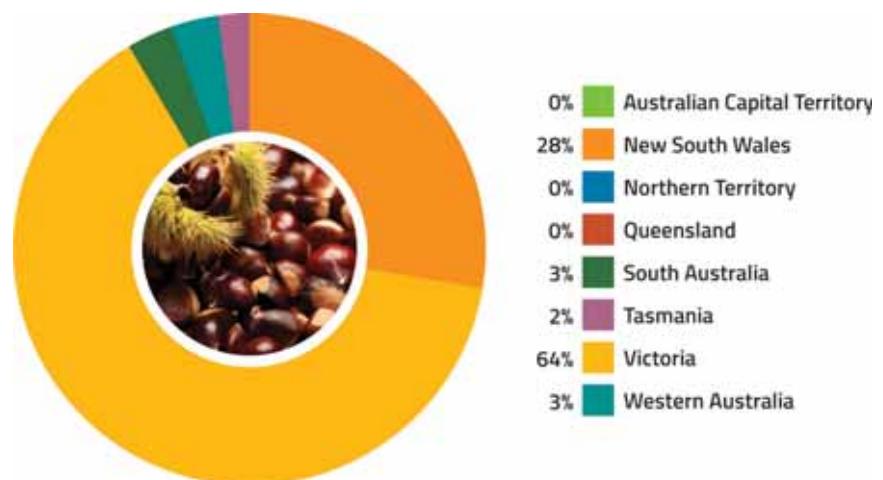
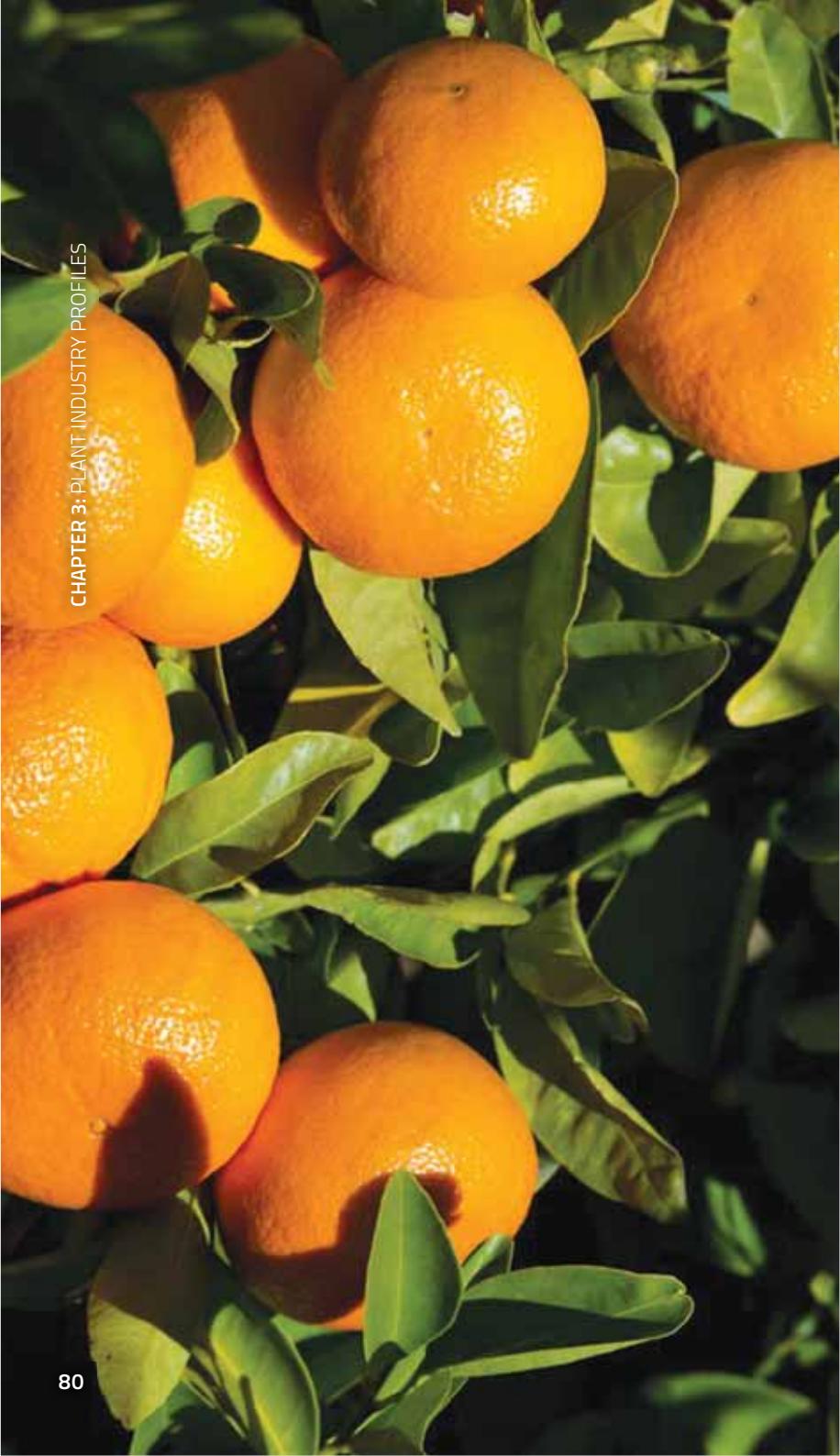


Figure 23. Distribution of chestnut production by state and territory, 2017–18 (based on LVP)





CITRUS

Represented by Citrus Australia
citrusaustralia.com.au

In 2017–18 production of oranges, mandarins, lemons, limes and grapefruit was valued at \$786 million (LVP), with exports valued at \$428 million.

The citrus industry is Australia's largest fresh fruit exporting industry by volume, with major export markets in China, Japan, Hong Kong, Malaysia, Indonesia, United Arab Emirates, Singapore, the United States and Thailand.

The five-year production average is 715,000 tonnes per annum, produced from approximately 26,000 hectares of citrus plantings nationally.

Citrus fruits are grown commercially throughout the Australian mainland excluding the ACT. Major growing areas include the Riverina in NSW; Central Burnett, Central Highlands and the far north of Queensland; Riverland in SA; the Murray Valley in Victoria–NSW and the Midlands and south-west of WA. There are a small number of commercial orchards in Darwin and the Katherine region of the NT.

A biosecurity project, Improving Biosecurity Preparedness of the Australian Citrus Industry (CT 17001), commenced in August 2018, funded by Hort Innovation supported by the citrus levy until June 2021. In the first two years, additional funding has been received from the Australian Government's Agricultural Competitiveness White Paper.

In 2019, Citrus Australia formed a Citrus Pest and Disease Prevention Committee as a result of growing concern from industry following the 2018 citrus canker outbreak in the NT and north-west WA. The objective is to prepare industry for future exotic plant pest responses.

The citrus industry is supported by a biosecurity plan, the Biosecurity Manual for Citrus Producers Version and the National Citrus Biosecurity Surveillance Strategy 2018–28. See page 207 for information about the National Citrus Biosecurity Program.

Table 15. High Priority Pests of the citrus industry

Scientific name	Common name
<i>Anastrepha ludens</i>	Mexican fruit fly
<i>Bactrocera carambolae</i>	Carambola fruit fly
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Bactrocera kandiensis</i>	Fruit fly
<i>Bactrocera occipitalis</i>	Fruit fly, Bezzi fruit fly
<i>Bactrocera trivialis</i>	New Guinea fruit fly
<i>Caliothrips fasciatius</i>	Bean thrips
<i>Candidatus Liberibacter africanus</i>	Huanglongbing (African strain)
<i>Candidatus Liberibacter americanus</i>	Huanglongbing (American strain)
<i>Candidatus Liberibacter asiaticus</i>	Huanglongbing (Asiatic strain)
<i>Citripestis sagittiferella</i>	Citrus fruit borer
<i>Citrus leprosis virus</i> (unassigned)	Citrus leprosis disease
<i>Citrus tristeza virus</i> (Cloveivirus) (mandarin stem-pitting strain)	Mandarin stem-pitting
<i>Diaphorina citri</i>	Asian citrus psyllid
<i>Frankliniella bispinosa</i>	Florida flower thrips
<i>Homalodisca vitripennis</i> (syn. <i>H. coagulata</i>)	Glassy winged sharpshooter
<i>Spiroplasma citri</i>	Stubborn
<i>Thaumatotibia leucotreta</i> (syn. <i>Cryptophlebia leucotreta</i>)	False codling moth
<i>Trioza erytreae</i>	African citrus psyllid
<i>Xanthomonas citri</i> subsp. <i>citri</i> (syn. <i>X. axonopodis</i> pv. <i>citri</i>)	Citrus canker
<i>Xylella fastidiosa</i> subsp. <i>pauca</i>	Pierce's disease, blueberry leaf scorch, olive quick decline

Figure 24. Annual value of citrus production, 2007–18

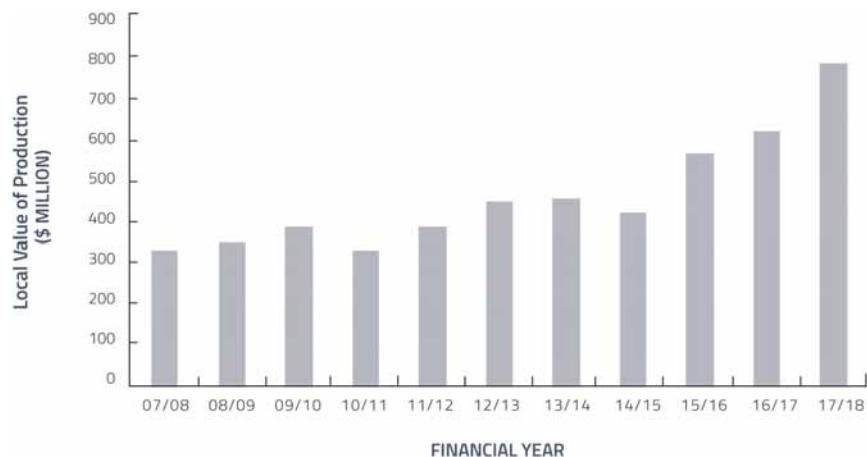
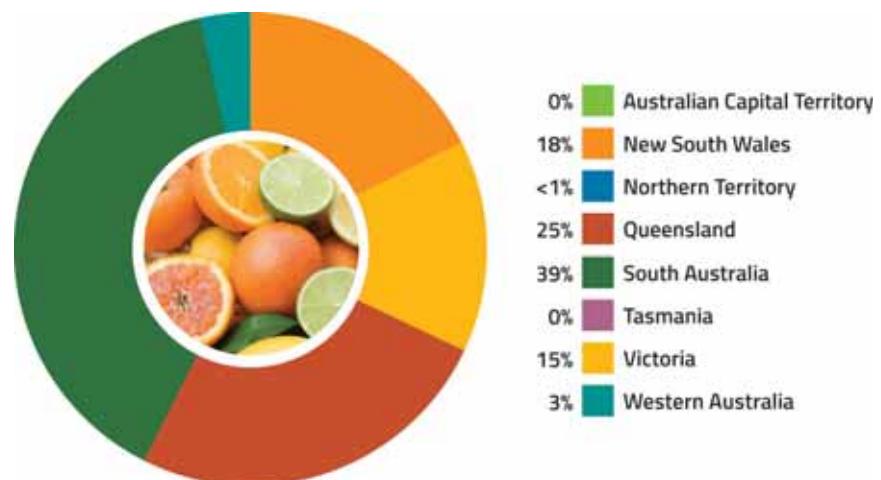


Figure 25. Distribution of citrus production by state and territory, 2017–18 (based on LVP)



COTTON

Represented by Cotton Australia
cottonaustralia.com.au

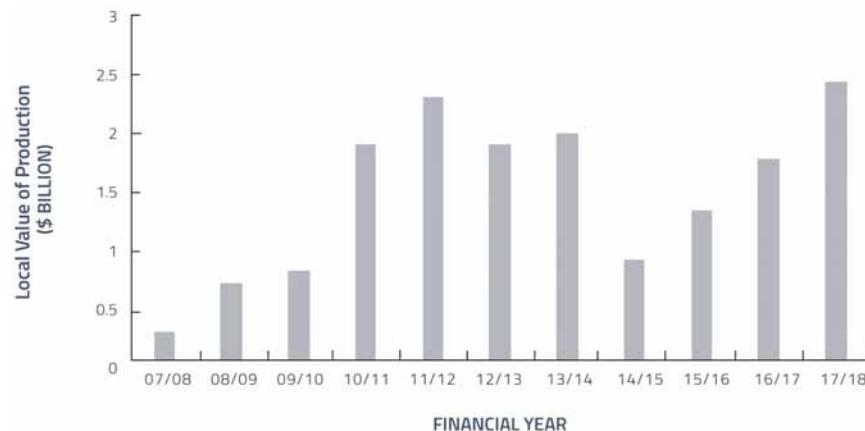
In 2017–18, cotton production was valued at \$2.5 billion (LVP). The cotton industry is an integral part of the Australian economy, worth on average more than \$2 billion per annum. Almost the entire Australian cotton crop is exported, with the majority sold to China and the remainder mainly to spinning mills in other parts of Asia.

Approximately 60 per cent of the national crop is grown in NSW, with the remainder grown in Queensland and a small number of fields in Victoria. Cotton is predominantly grown as an annual irrigated summer crop, with rain-grown cotton representing approximately 20 per cent of the total planted area.

Although a relatively small producer on the world scale, Australia sustainably produces high quality, low contaminant cottons that attract a premium price on the world market. Australian cotton yields are high by international standards, at nearly three times the world average.²²

The Cotton Industry Biosecurity Group meets annually to discuss biosecurity issues and to make sure industry's responsibilities under the Emergency Plant Pest Response Deed are met each year.

Figure 26. Annual value of cotton production, 2007–18

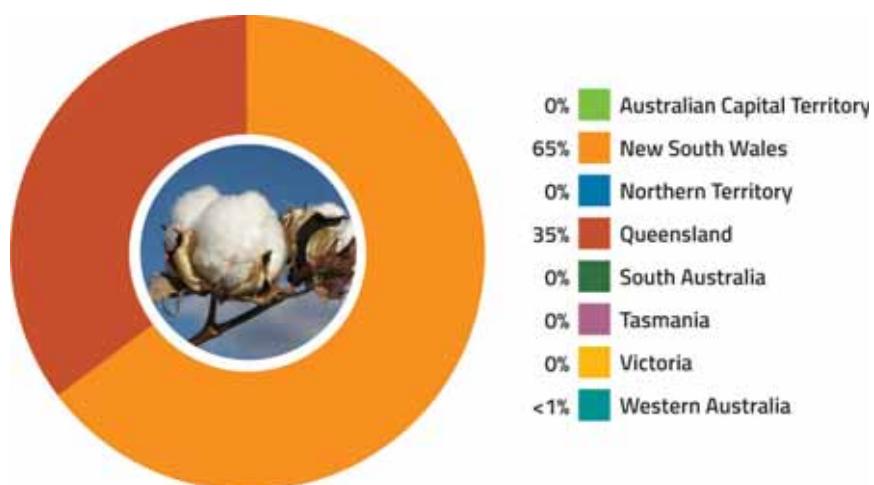


22. Cotton Australia (2018). Australian Cotton Industry Statistics

Table 16. High Priority Pests of the cotton industry

Scientific name	Common name
<i>Anthonomus grandis</i>	Boll weevil
<i>Cotton leaf curl virus complex</i> (Begomovirus)	Cotton leaf curl disease
<i>Cotton leafroll dwarf virus</i> (Polerovirus)	Cotton blue disease
<i>Dysdercus</i> spp. (including <i>D. honestus</i> , <i>D. maurus</i> , <i>D. suturellus</i> (American species))	Cotton stainer
<i>Fusarium oxysporum</i> f. sp. <i>vasinfectum</i> (exotic races)	Fusarium wilt
<i>Helicoverpa armigera</i> (carrying Bt resistance alleles)	Cotton bollworm
<i>Lygus hesperus</i>	Western plant bug
<i>Lygus lineolaris</i>	Tarnished plant bug
<i>Spodoptera frugiperda</i>	Fall armyworm
<i>Thaumatotibia leucotreta</i> (syn. <i>Cryptophlebia leucotreta</i>)	False codling moth
<i>Verticillium dahliae</i> (defoliating strain)	Verticillium wilt
<i>Xanthomonas citri</i> subsp. <i>malvacearum</i> (syn. <i>X. axonopodis</i> pv. <i>malvacearum</i>)	Bacterial blight, angular leaf spot

Figure 27. Distribution of cotton production by state and territory, 2017–18 (based on LVP)



DRIED FRUITS (GRAPES)

Represented by Dried Fruits Australia
driedfruitsaustralia.org.au

In 2017–18, dried grape production (sultana types, currants and raisins) had an estimated value of \$34 million (LVP) with exports valued at \$19.8 million. The 2020 crop is estimated to be 15,000 tonnes. Export sales of dried vine fruits to Europe and Asia are expected to increase to 5,000 or more tonnes in coming years. In Australia, grapes for the dried fruit industry are predominantly grown in the Sunraysia region which spans north western Victoria and south-western NSW around the Murray River, and also in the SA Riverland.

The dried fruit industry regularly distributes biosecurity information and guidelines from PHA to its members via a quarterly publication, *The Vine*, and through the email newsletter *Currant News*. The viticulture biosecurity manual has been distributed to growers of dried fruit through the major industry processors. The industry also undertakes Emergency Plant Pest Response training in order to understand the roles and responsibilities of their officers in the event of a pest incursion.

During 2019, producers voted to introduce a biosecurity levy to enable the dried vine fruits industry value chain to be a contributing participant in national biosecurity related activities and projects such as surveillance and emergency scenarios.

Table 17. High Priority Pests of the dried fruit industry

Scientific name	Common name
<i>Bactrocera carambolae</i>	Carambola fruit fly
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Candidatus Phytoplasma solani</i>	Bois noir
<i>Daktulosphaira vitifoliae</i> (exotic strains)	Grapevine phylloxera
<i>Drosophila suzukii</i>	Spotted wing drosophila
Grapevine flavescentia dorée phytoplasma	Flavescentia dorée
<i>Guignardia bidwellii</i>	Black rot
<i>Homalodisca vitripennis</i> (syn. <i>H. coagulata</i>)	Glassy winged sharpshooter
<i>Hyalesthes obsoletus</i>	Cixiidae planthopper
<i>Lobesia botrana</i>	European grapevine moth
<i>Planococcus ficus</i>	Vine mealybug
<i>Polychrosis viteana</i>	American berry moth
<i>Pseudococcus maritimus</i>	Grape mealybug
<i>Xylella fastidiosa</i> (subsp. not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald

Figure 28. Annual value of dried fruit production, 2007–18

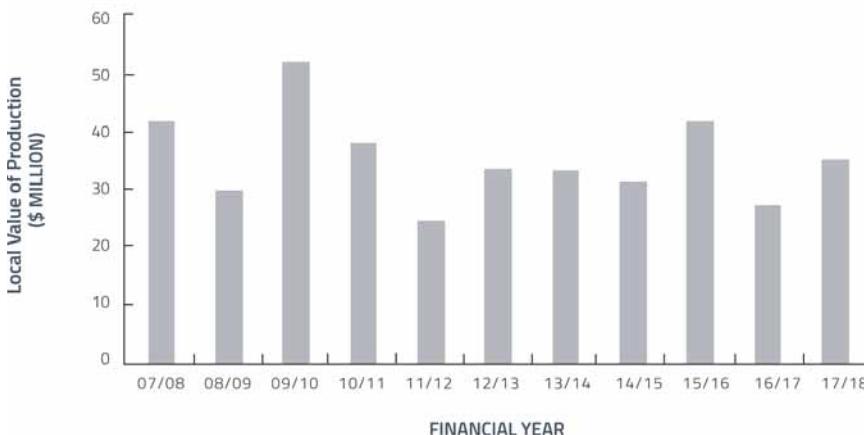
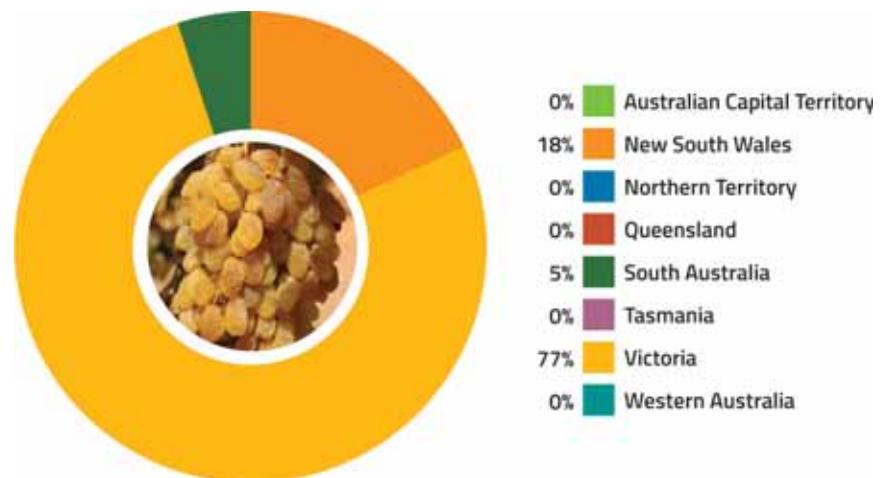


Figure 29. Distribution of dried fruit production by state and territory, 2017–18 (based on LVP)





FORESTRY

Represented by the Australian Forest Products Association
ausfpa.com.au

In 2017–18, plantation forestry production was valued at \$2.3 billion (LVP),²³ with wood product exports valued at \$3.6 billion. The forest, wood and paper products sector is Australia's sixth largest manufacturing industry.

Australia is the seventh most forested country in the world, with 131 million hectares of native forest on public and private land and two million hectares of plantation forestry.

Of this native forest, only 100,000 hectares is harvested for timber annually (less than 0.06 per cent of Australia's total native forests). All native forest harvested is sustainably regrown, with the regrowth quickly becoming an abundant food source and habitat for native species.

Plantation species are split almost evenly between softwood and hardwood plantations.

Softwood plantations are predominately long rotation (from 28 to 40 years) and produce logs for a range of products including structural timber for housing, appearance grade sawn timber, wood-based panels, engineered wood products, paper and paperboard. The majority of softwood grown in Australia is *Pinus radiata*, which is the dominant species in SA, NSW, Victoria and Tasmania. *P. elliottii* and *P. caribaea* are grown in Queensland and northern NSW, and *P. pinaster* is grown in WA. There is also a notable area (around 50,000 hectares) of native hoop pine (*Araucaria cunninghamii*) in the south-east of Queensland and northern NSW.

Hardwood plantations include short rotation eucalypt species (eight to 12 years) grown for woodchips to be made into tissue, paper and paperboard products, and around 10 per cent are long rotation species, producing logs for a range of products including appearance grade sawn timber and structural timber for housing.

There are also some small plantings of *Acacia mangium*, African mahogany and sandalwood grown in the NT and northern WA.

Of the 36.6 million hectares of native forest both available and suitable for commercial wood production, 7.5 million hectares is multiple-use public forests. The remainder is in leasehold and private forests. Multiple-use native forests are managed by state government departments or agencies in NSW, Queensland, Victoria, WA and Tasmania and are defined as crown land managed for a range of values including wood harvesting, water supply, conservation, recreation and environmental protection.

Currently, a funding partnership between the Department of Agriculture and the Australian Forest Products Association is being used to establish a National Forest Biosecurity Surveillance Program. The initiative is being managed by PHA through the National Forest Biosecurity Coordinator (see page 154).

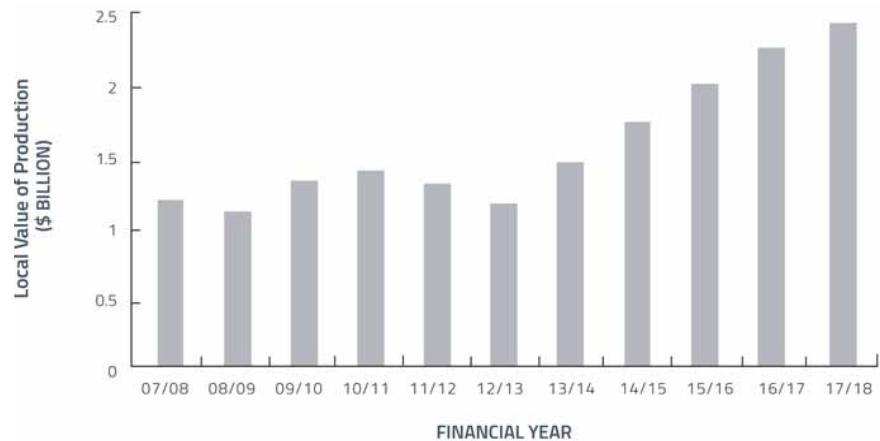
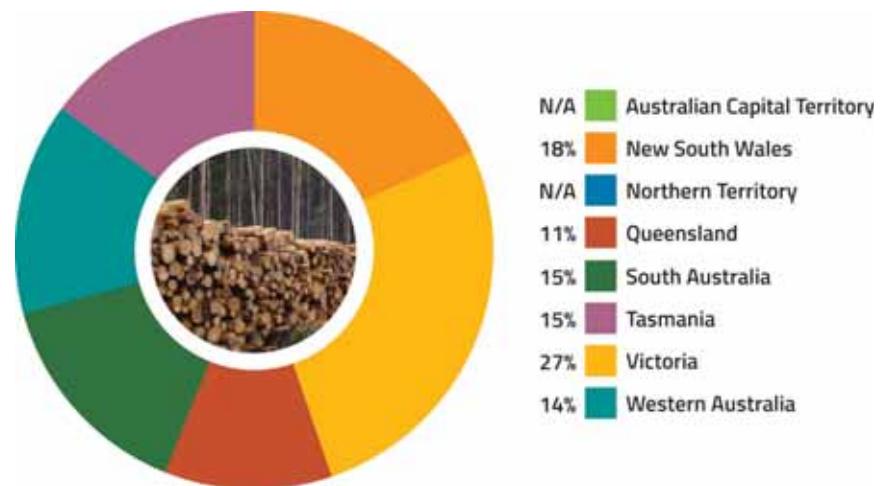
The forestry industry developed the plantation forest biosecurity plan, the Biosecurity Manual for the Plantation Timber Industry and the National Forest Biosecurity Surveillance Strategy 2018–23.

Table 18. High Priority Pests of the plantation forestry industry

Scientific name	Common name
<i>Austropuccinia psidii</i> sensu lato (exotic variants) (syn. <i>Puccinia psidii</i>)	Myrtle rust, guava rust, Eucalyptus rust
<i>Bursaphelenchus</i> spp. including <i>B. xylophilus</i>	Pinewood nematode species complex
<i>Chrysoporthe austroafricana</i>	Eucalyptus canker disease
<i>Coptotermes formosanus</i>	Formosan subterranean termite
<i>Coptotermes gestroi</i>	Asian subterranean termite
<i>Dendroctonus ponderosae</i>	Mountain pine beetle
<i>Dendroctonus valens</i>	Red turpentine beetle
<i>Endocronartium harknessii</i>	Western gall rust
<i>Fusarium circinatum</i>	Pitch canker
<i>Hylesia nigricans</i>	Burning moth
<i>Ips typographus</i>	Spruce bark beetle
<i>Lymantria dispar</i>	Asian gypsy moth
<i>Lymantria monacha</i>	Nun moth
<i>Monochamus</i> spp. including <i>M. alternatus</i> , <i>M. galloprovincialis</i> , <i>M. titillator</i> , <i>M. scutellatus</i>	Longhorn beetle
<i>Orgyia thyellina</i>	White spotted tussock moth
<i>Phytophthora pinifolia</i>	Dano foliar del pino
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Teratosphaeria gauchensis</i>	Coniothyrium eucalyptus canker
<i>Teratosphaeria zuluensis</i>	Coniothyrium eucalyptus canker
<i>Tomicus piniperda</i>	Pine shoot beetle
<i>Urocerus gigas</i>	Giant wood wasp

23. Forestry LVP data consists of hardwood (plantation) and softwood logs

24. There is a small amount of production in the ACT and NT but data is not available (N/A) for these regions

Figure 30. Annual value of plantation forestry production, 2007–18**Figure 31. Distribution of plantation forestry production by state and territory, 2017–18 (based on LVP)²⁴**

GINGER

Represented by the Australian Ginger Industry Association
australiangerger.org.au

In 2017–18, ginger production was valued approximately \$55 million. Land under cultivation was about 270 hectares, producing around 9,850 tonnes of ginger.

Production takes place in Australia's subtropical and tropical regions and there are approximately 50 commercial ginger growers, most of them based in Queensland. Key Queensland growing districts are Gatton, Glasshouse Mountains, Beerwah, Yandina, Mary Valley, Maryborough and Bundaberg. Growers can also be found in northern NSW and far north Queensland.

There are two varieties grown commercially: Jumbo (also known as Canton) and Queensland, with 25 per cent sold to the processing sector and 75 per cent sold to the fresh market. Currently no ginger is exported.

Biosecurity is included in the AgriFuture Australia's Ginger Program RD&E Plan 2017–22 and is an integral part of Australian Ginger Industry Association's activities. The association represents the biosecurity interests of ginger producers and industry by funding and supporting biosecurity initiatives. Information from PHA is shared regularly with members via meetings, newsletters and email updates.

Table 19. High Priority Pests of the ginger industry

Scientific name	Common name
<i>Aspidiella hartii</i>	Yam scale, rhizome scale
<i>Elytroteinus subtruncatus</i>	Fijian ginger weevil
<i>Radopholus similis</i> (exotic strains)	Burrowing nematode
<i>Ralstonia solanacearum</i> race 4 (exotic strains)	Bacterial wilt

Figure 32. Annual value of ginger production, 2010–18

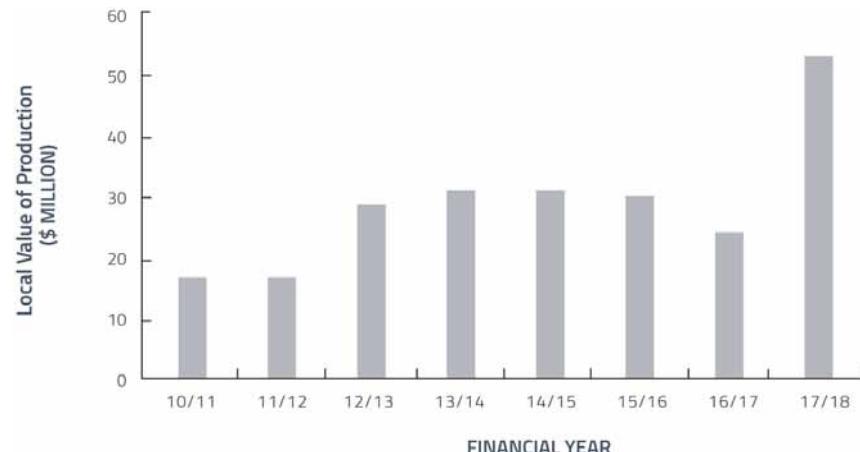


Figure 33. Distribution of ginger production by state and territory, 2017–18 (based on LVP)





Image courtesy of the Australian Ginger Industry Association

GRAINS

Represented by Grain Producers Australia
grainproducers.com.au

In 2017–18, grain production was valued at \$11.4 billion with exports valued at \$11.14 billion. The grains industry accounted for 21 per cent of Australian agriculture's gross value of production and 23 per cent of agriculture's export income, making it Australia's largest plant industry.²⁵

Most of Australia's grain is produced across the region known as the wheat belt, which stretches from central Queensland through NSW, Victoria, Tasmania, SA and southern WA. Due to the wide-ranging soil types and climatic variability across Australia, a range of crop species and varieties are grown, each of which has specific pests and diseases that pose a threat to production and can influence access to markets (both domestic and overseas).

Grain Producers Australia (GPA) funds a biosecurity outreach program, the Grains Farm Biosecurity Program, managed by PHA and delivered by grains biosecurity officers in each grain producing state. The program raises awareness to help improve practices on farm and boost preparedness to manage biosecurity threats. See more on page 206.

Throughout 2019, the grain industry through GPA worked with PHA to develop a strategy for post border grain biosecurity. The program will focus on surveillance and building capacity to respond to potential biosecurity threats. It is expected to be implemented in 2020.

The grains industry developed a biosecurity plan, the Biosecurity Manual for Grain Producers, the Farm Biosecurity Manual for the Organic Grains Industry, and the National Grain Biosecurity Surveillance Strategy 2019–29.



Image courtesy of WA Grains Biosecurity Officer, Jeff Russell

Figure 34. Annual value of grains production, 2007–18

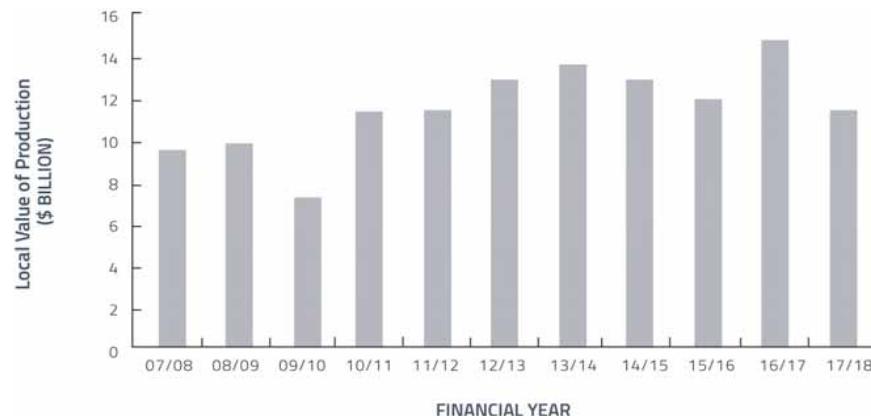
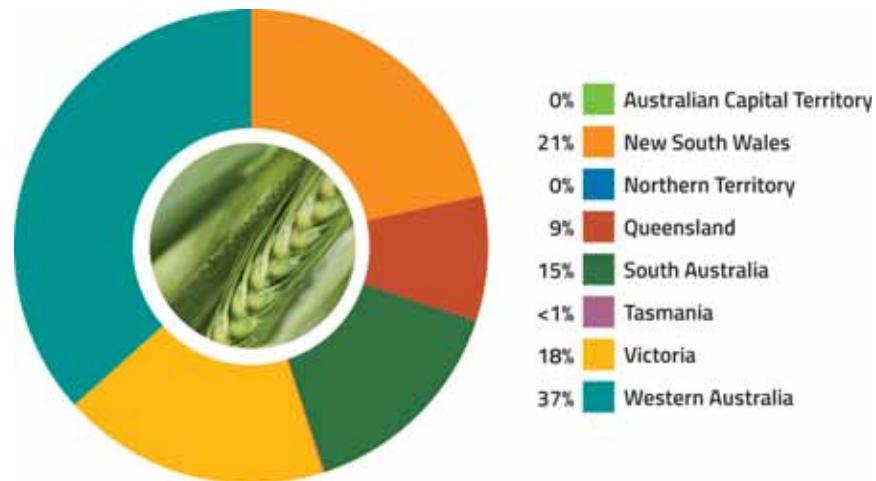


Figure 35. Distribution of grains production by state and territory, 2017–18 (based on LVP)



25. Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra. Agricultural Commodities December Quarter 2019 – Statistics. Accessed online 11 February 2020 agriculture.gov.au/sites/default/files/documents/Agricultural-Commodities-December-2019.pdf

Table 20. High Priority Pests of the grains industry

Scientific name	Common name
<i>Ascochyta rabiei</i> (exotic mating types)	Ascochyta blight
<i>Barley mild mosaic virus</i> (Bymovirus)	Barley mild mosaic virus
<i>Bean common mosaic virus</i> (Potyvirus), peanut stripe strain	Bean common mosaic virus
<i>Cephus cinctus</i>	Wheat stem sawfly
<i>Cephus pygmeus</i>	European wheat stem sawfly
<i>Ceutorhynchus assimilis</i> (syn. <i>C. obstrictus</i>)	Cabbage seedpod weevil
<i>Ceutorhynchus napi</i>	Rape stem weevil
<i>Ceutorhynchus pallidactylus</i>	Cabbage stem weevil
<i>Chickpea chlorotic dwarf virus</i> (Mastrevirus)	Chickpea chlorotic dwarf virus
<i>Chickpea chlorotic stunt virus</i> (Polerovirus)	Chickpea chlorotic stunt virus
<i>Chilo orichalcociliellus</i>	Coastal stem borer
<i>Chilo partellus</i>	Spotted stem borer
<i>Colletotrichum truncatum</i> (lentil affecting strain)	Lentil anthracnose
<i>Cylindrocopturus adspersus</i>	Sunflower stem weevil
<i>Diabrotica barberi</i>	Northern corn rootworm
<i>Diabrotica undecimpunctata</i>	Southern corn rootworm
<i>Diabrotica virgifera</i>	Western corn rootworm
<i>Diaporthe helianthi</i>	Sunflower stem canker
<i>Diuraphis noxia</i> *	Russian wheat aphid
<i>Eurygaster integriceps</i>	Sunn pest
<i>Fusarium oxysporum</i> f. sp. <i>ciceris</i>	Fusarium wilt of chickpea
<i>Fusarium oxysporum</i> f. sp. <i>glycines</i>	Fusarium wilt of soybean
<i>Fusarium oxysporum</i> f. sp. <i>lupini</i>	Fusarium wilt of lupin
<i>Fusarium virguliforme</i>	Sudden death syndrome
<i>Groundnut bud necrosis virus</i> (Tospovirus)	Bud necrosis disease
<i>Groundnut ringspot virus</i> (Tospovirus)	Groundnut ringspot virus

*established in Australia

Scientific name	Common name
<i>Harpophora maydis</i>	Late wilt
<i>Heterodera ciceri</i>	Chickpea cyst nematode
<i>Heterodera filipjevi</i>	Cereal cyst nematode
<i>Heterodera glycines</i>	Soybean cyst nematode
<i>Heterodera latipons</i>	Mediterranean cereal cyst nematode
<i>Heterodera sorghi</i>	Sorghum cyst nematode
<i>Homoeosoma electellum</i>	Sunflower moth
<i>Magnaporthe grisea</i>	Rice blast
<i>Mayetiola destructor</i>	Hessian fly
<i>Mayetiola hordei</i>	Barley stem gall midge
<i>Mungbean yellow mosaic virus</i> (Begomovirus)	Mungbean yellow mosaic virus
<i>Nysius huttoni</i>	Wheat bug
<i>Pantoea stewartii</i>	Stewart's wilt of maize
<i>Peanut clump virus</i> (Pecluvirus)	Peanut clump virus
<i>Peronosclerospora philippinensis</i>	Philippine downy mildew of maize
<i>Peronosclerospora sorghi</i>	Downy mildew of sorghum
<i>Plasmopara halstedii</i>	Downy mildew of sunflower
<i>Prostephanus truncatus</i>	Larger grain borer
<i>Puccinia graminis</i> f. sp. <i>tritici</i> (exotic pathogenic races)	Stem rust of wheat
<i>Puccinia striiformis</i> f. sp. <i>hordei</i>	Barley stripe rust
<i>Rhizoctonia solani</i> f. sp. <i>sasakii</i> (AG1) teleomorph <i>Corticium sasakii</i> (syn. <i>Thanatephorus cucumeris</i>)	Banded leaf and sheath spot
<i>Riptortus dentipes</i>	Pod sucking bug
<i>Schizaphis graminum</i>	Greenbug
<i>Soil-borne wheat mosaic virus</i> (Furovirus)	Soil-borne wheat mosaic virus
<i>Thaumatomibia leucotreta</i> (syn. <i>Cryptophlebia leucotreta</i>)	False codling moth
<i>Tilletia indica</i>	Karnal bunt
<i>Trogoderma granarium</i>	Khapra beetle
<i>Zea mosaic virus</i> (Potyvirus)	Zea mosaic virus

HAZELNUTS

Represented by Hazelnut Growers of Australia
hazelnuts.org.au

In 2017–18, hazelnut production was valued at \$3.7 million (LVP).

The industry has expanded, with major on-farm investment from a northern hemisphere confectionary manufacturer giving renewed confidence to Australian growers. Approximately 1.3 million trees are planted on 2,500 hectares, with approximately 350 tonnes of hazelnuts produced in 2019. The industry estimates that by 2021 hazelnut production will be 5,500 tonnes with a value of \$40 million.

Hazelnuts are grown in the temperate areas of south-eastern Australia. The main production regions are the central tablelands of NSW around Orange and Narrandera, and north-east Victoria around Myrtleford. They are also grown in central and eastern Victoria and increasingly in northern Tasmania.

Australia imports 3,300 tonnes of hazelnut product annually, primarily from Turkey. Imported produce is mainly in kernel form for use by mass market confectioners.

In 2019, Hazelnut Growers of Australia was involved in a number of responses to pest incursions affecting the hazelnut industry, including detections of brown marmorated stink bug in cargo.

Australia is free from eastern filbert blight, a serious disease affecting the industry in the United States, and most other hazelnut pests and diseases that affect growers overseas.

Biosecurity is considered in the Australian Hazelnut Industry Five Year Strategic Plan (2015–20) and the industry peak body is represented at PHA meetings and government Biosecurity Roundtables.

Table 21. High Priority Pests of the hazelnut industry

Scientific name	Common name
<i>Anisogramma anomala</i>	Eastern filbert blight, hazelnut blight
<i>Chinavia hilaris</i> (syn. <i>C. hilare</i>)	Green stink bug
<i>Halyomorpha halys</i>	Brown marmorated stink bug
<i>Lymantria dispar</i>	Gypsy moth (Asian and European strains)
<i>Phytophthora ramorum</i>	Sudden oak death

Figure 36. Annual value of hazelnut production, 2010–18

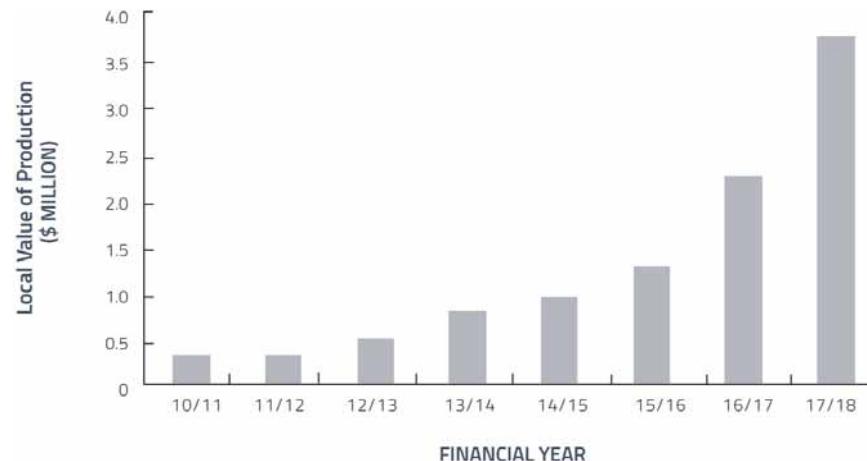


Figure 37. Distribution of hazelnut production by state and territory, 2017–18 (based on LVP)

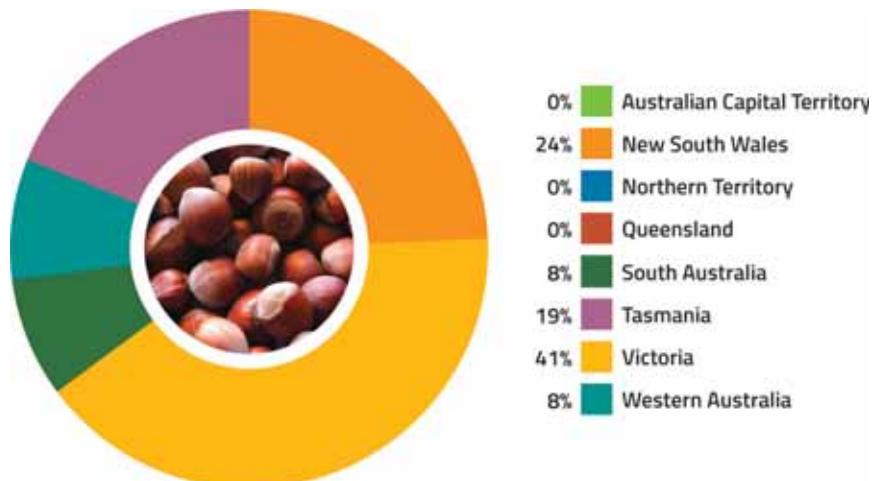




Image courtesy of the Hazelnut Growers of Australia Inc



HONEY BEES

Represented by the Australian Honey Bee Industry Council (AHBIC)
honeybee.org.au

In 2017–18, honey and beeswax production was valued at \$126 million (LVP).

Around 30,000 registered beekeepers operate nearly 669,000 hives. Of these, 1,868 operate commercially with 50 or more hives. Apiaries range in size from one hive to several thousand.

The industry has products other than honey. Australia exports live bees and our beeswax commands a premium price overseas. Trade relies on the healthy status of Australia's bees, with beeswax valued highly because it lacks residue from miticides used overseas to treat Varroa mites.

Australia's bees are further valued for their pollination services. The economic value of managed and feral honey bees as pollinators was estimated to lie between \$8.35 to \$19.97 billion in 2014–15.²⁶

AHBIC works in partnership with other industries and governments to protect the health of bees with several biosecurity initiatives. One is the National Bee Pest Surveillance Program, which operates at ports around Australia to provide an early detection mechanism for exotic pests of bees and pest bees. More about this government and industry partnership is on page 154.

Another was to work with PHA and state and territory governments to develop the Australian Honey Bee Industry Biosecurity Code of Practice, which was endorsed nationally by the honey bee industry in 2016. The aim of the Code of Practice is to improve the management of established pests and diseases, as well as increase preparedness and surveillance for exotic pest threats.

The honey bee industry also funds the National Bee Biosecurity Program, a partnership between industry and government, which employs Bee Biosecurity Officers (BBO) in all Australian states. BBOs provide training and education to help beekeepers to implement biosecurity measures and ensure they are complying with the Code of Practice and relevant legislation (see page 207).

Following the detection of Varroa mites (*Varroa jacobsoni*) on Asian honey bees in Townsville in June 2016, the Australian Government Department of Agriculture established the National Varroa Mite Eradication Program, of which AHBIC has been a part. No bees or Varroa mites associated with this incident in Townsville have been found since November 2016.

Suspect Varroa mites (*Varroa jacobsoni*) were again detected on Asian honey bees at the Port of Townsville in May 2019. Genetic testing of bees indicated that it was a new incident. AHBIC has been involved with the eradication of this second detection, which is expected to move to Proof of Freedom Phase in February 2020.

26. Karasinski, J (2018). The economic valuation of Australian managed and wild bee pollinators in 2014–15 Curtin University. Accessed online 12 February 2020 aussiepollination.com.au

Figure 38. Annual value of honey bee and beeswax production, 2007–18

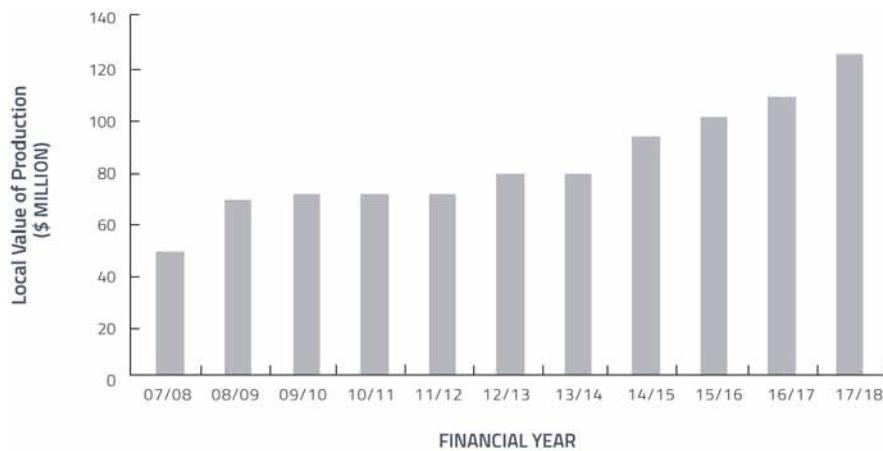


Figure 39. Distribution of honey and beeswax production by state and territory, 2017–18
(based on LVP)

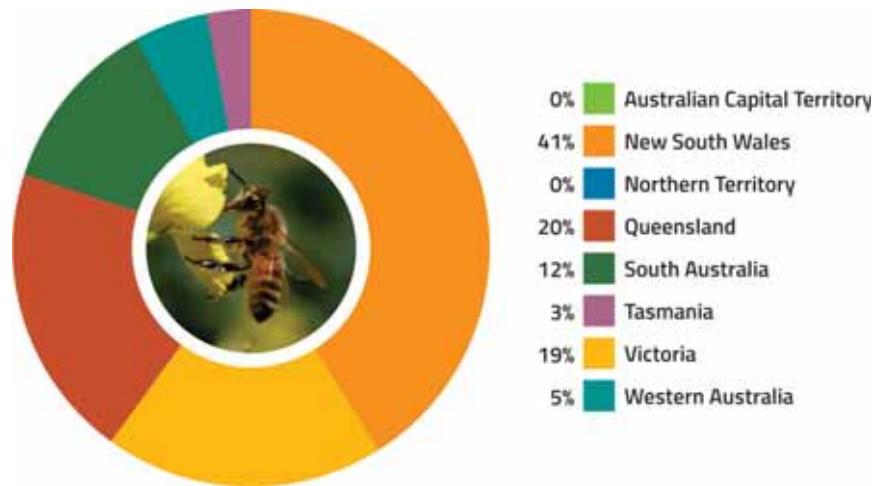


Table 22. High Priority Pests of the honey bee industry

Scientific name	Common name
<i>Acarapis woodi</i>	Tracheal mite
<i>Apis cerana</i> (exotic strains, genotypes and sub-species)	Asian honey bee
<i>Apis mellifera capensis</i>	Cape honey bee
<i>Apis mellifera scutellata</i>	African honey bee
<i>Apis mellifera scutellata</i> (hybrid)	Africanised honey bee
<i>Deformed wing virus</i> (Iflavirus)	Deformed wing virus
<i>Hoplostoma fuligineus</i>	Large hive beetle
<i>Slow paralysis virus</i> (Iflavirus)	Slow paralysis virus
<i>Tropilaelaps clareae</i>	Tropilaelaps mite
<i>Tropilaelaps mercedesae</i>	Tropilaelaps mite
<i>Varroa destructor</i>	Varroa mite
<i>Varroa jacobsoni</i>	Varroa mite
<i>Vespa</i> spp. (exotic species)	Hornets



LYCHEES

Represented by the Australian Lychee Growers' Association
australianlychee.com.au

In 2017–18, lychee production of 2,733 tonnes was valued at \$24 million (LVP), with 466 tonnes exported valued at \$5.2 million.

Higher volumes of lychee exports occur during the lead up to the Chinese New Year. Kwai Mai Pink is the preferred export variety due to availability, taste, quality and price. Salathiel, with a good flesh to seed ratio, is in high demand in Singapore and yields good returns for growers willing to persist with this variety. Exports of Australian lychees to the United States are increasing each year, with 10 tonnes exported in the 2018–19 season.

This figure is expected to double in the 2019–20 season.

The new Chinese varieties of Chompogo, Erdon Lee and Baitangying are now appearing in the domestic markets: even though quantities are small, these varieties will continue to increase as current plantings mature.

Following the 2016 signing of the memorandum of understanding between the Australian Department of Agriculture and Taiwan Agriculture Research Institute, six Taiwanese lychee varieties have now been planted on an orchard in central Queensland. This is a long-term project, as it will be a number of years before Taiwan is able to apply for Plant Breeder's Rights for these new varieties.

Lychees are produced as a single annual crop with the harvest period from late October (north Queensland) to March (northern NSW). This gives the Australian lychee season one of the world's longest production period, as well as a counter-seasonal supply to most other lychee producing countries.

Table 23. High Priority Pests of the lychee industry

Scientific name	Common name
<i>Aristobia testudo</i>	Lychee longicorn beetle
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Conopomorpha sinensis</i>	Lychee fruit borer
<i>Paradasynus longirostris</i>	Hong Kong stink bug
<i>Peronophthora litchii</i>	Brown blight
<i>Pseudotheraptus wayi</i>	Coconut bug
Unknown (suspected phytoplasma)	Longan and lychee witches' broom disease

Figure 40. Annual value of lychee production 2009–18

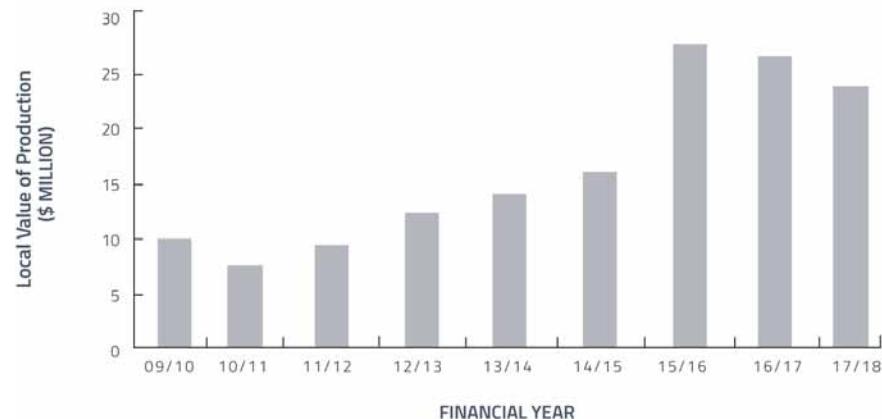


Figure 41. Distribution of lychee production by state and territory, 2017–18 (based on LVP)



MACADAMIAS

Represented by the Australian Macadamia Society
australian-macadamias.org

In 2017–18, macadamia production was valued at \$242 million (LVP) with exports valued at \$266 million. Annual macadamia production has more than tripled in the last 10 years. The export value of the Australian industry grew by 23 per cent in the 12 months to June 2019.

Approximately 70 per cent of the crop is exported, principally to Europe, the United States, Japan and other Asian countries as kernel and to China in-shell. Australia, South Africa and Kenya are currently the world's largest producers of macadamia. China, the rest of Africa and South America are also significant producers. There are now approximately 800 macadamia growers with 28,000 hectares of crop in Australia. The majority of plantings are varieties of *Macadamia integrifolia*. Of these, about 75 per cent are Hawaiian varieties, with the remainder being Australian. Five new Australian-bred varieties have been released in the last few years including MCT1, a small precocious and high yielding variety that is proving very popular. Harvest commences in March and runs through to August.

Macadamias are grown along the eastern seaboard of NSW and Queensland, from Port Macquarie in the south through to the Atherton Tablelands in the north. Collectively Bundaberg and the Northern Rivers region produce more than 75 per cent of the Australian crop. Production is growing fastest in Bundaberg in Queensland and the Clarence Valley in NSW. New plantings are also being developed in Mackay and Maryborough in Queensland and in the Richmond and Clarence Valleys in NSW.

Approximately 70 per cent of orchards employ professional pest scouts. The Australian Macadamia Society convenes a forum where pest pressures for the previous season are reviewed and any new pest and disease sightings reported. A number of integrated pest and disease management related research projects are being funded through Hort Innovation, and the society recently distributed over 500 farm biosecurity signs to macadamia growers. The macadamia industry is also one of the contributors to the Varroa mite incursion response being managed by the Queensland Government.

Table 24. High Priority Pests of the macadamia industry

Scientific name	Common name
<i>Hypothenemus obscurus</i>	Tropical nut borer
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Tropilaelaps clareae</i>	Tropilaelaps mite
<i>Tropilaelaps mercedesae</i>	Tropilaelaps mite
<i>Varroa destructor</i>	Varroa mite
<i>Xylella fastidiosa</i> (including <i>X. fastidiosa</i> subsp. <i>fastidiosa</i> , <i>X. fastidiosa</i> subsp. <i>multiplex</i> , <i>X. fastidiosa</i> subsp. <i>piercei</i>) (with vector)	Almond leaf scorch, pecan bacterial leaf scorch

Figure 42. Annual value of macadamia production 2007–18

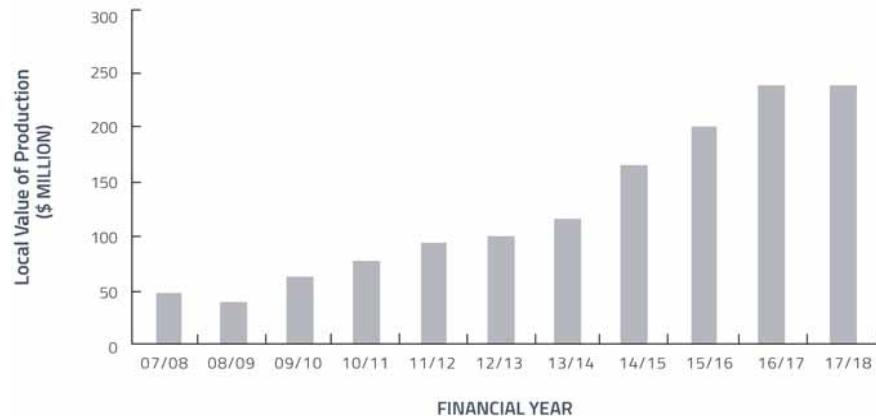
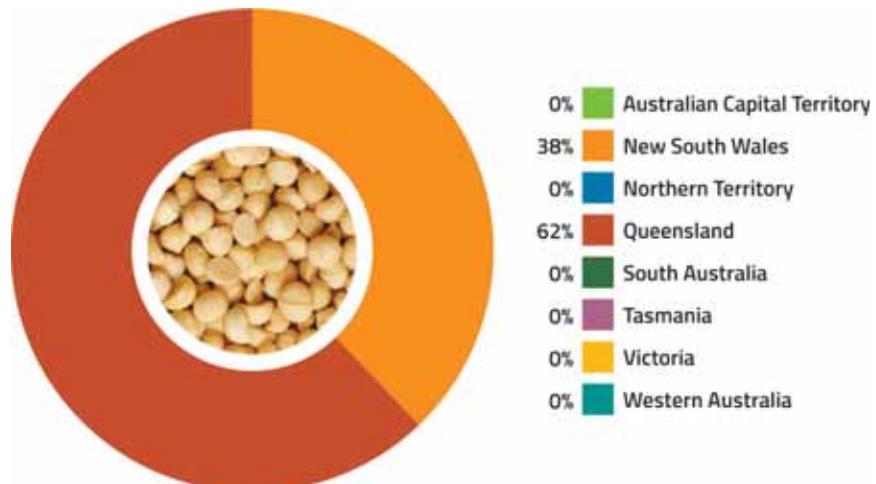


Figure 43. Distribution of macadamia production by state and territory, 2017–18 (based on LVP)



MANGOES

Represented by the Australian Mango Industry Association
industry.mangoes.net.au

In 2017–18, mango production was valued at \$127 million (LVP), with exports valued at \$28.7 million.

Over the last four years the average production volume has been 70,000 tonnes per year. Approximately 80 per cent of fruit is consumed fresh, 10 per cent is exported and the remaining fruit is processed.

In Australia, nine varieties of mango are in commercial production. The most abundant variety, Kensington Pride, accounts for around 45 per cent of Australian production. Other varieties include B74 (Calypso), Honey Gold, and R2E2, green eating varieties such as Keow Savoey and Nam Doc Mai, as well as late season varieties such as Brooks, Keitts, Palmers, Kents and Pearls. B74 and R2E2 are popular in export markets. There are other varieties produced in smaller volumes.

The industry supplies the Australian market, with production occurring from August to March each year. Most mangoes are grown in Queensland and the NT with smaller but significant production in regions throughout WA.

An Industry Development Officer is part-funded through the PHA levy to promote and facilitate biosecurity practices in the mango industry. In 2019 the mango industry updated their biosecurity plan with PHA and governments.

Figure 44. Annual value of mango production, 2007–18

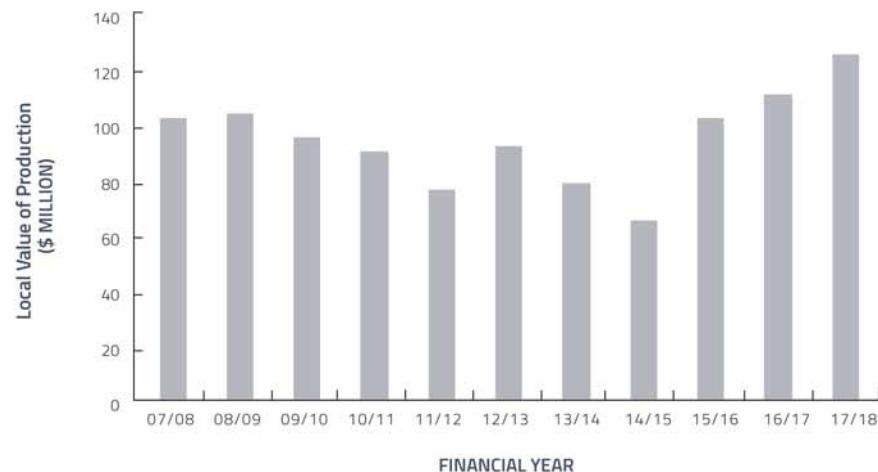


Figure 45. Distribution of mango production by state and territory, 2017–18 (based on LVP)

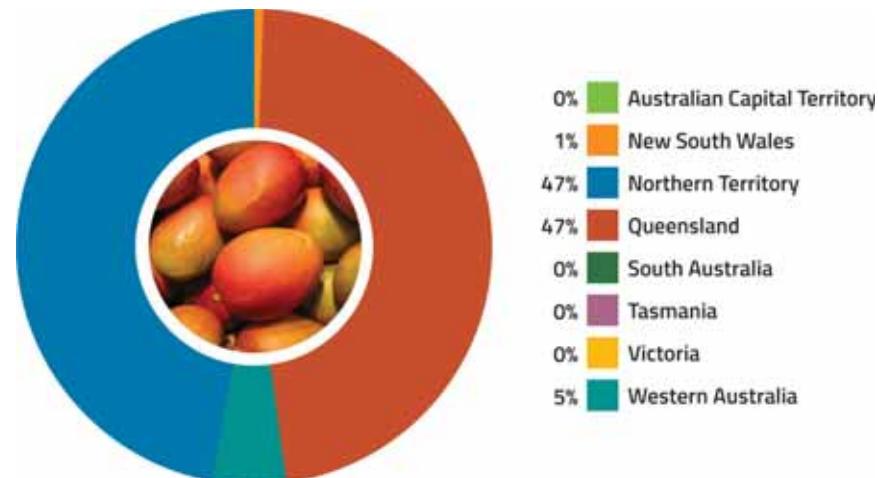


Table 25. High Priority Pests of the mango industry

Scientific name	Common name	Scientific name	Common name
<i>Acanthocoris scabrator</i>	Squash bug	<i>Ceratocystis manginecans</i>	Mango sudden decline syndrome
<i>Aleurocanthus woglumi</i>	Citrus blackfly	<i>Chlumetia transversa</i>	Mango shoot borer
<i>Amritodus atkinsoni</i>	Mango leafhopper	<i>Dasineura amaramanjarae</i>	Mango gall midge
<i>Anastrepha obliqua</i>	West Indian fruit fly	<i>Deanolis sublimbalis</i> (syn. <i>Noorda albizonalis</i>)	Red-banded mango caterpillar
<i>Bactrocera albistrigata</i>	White striped fruit fly	<i>Hypocryphalus dilutus</i>	Ambrosia beetle
<i>Bactrocera carambolae</i>	Carambola fruit fly	<i>Idioscopus nagpurensis</i>	Mango leafhopper
<i>Bactrocera correcta</i>	Guava fruit fly	<i>Parasa lepida</i>	Blue-striped nettle grub
<i>Bactrocera curvipennis</i>	Banana fruit fly	<i>Procontarinia allahabadensis</i>	Mango gall midge
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly	<i>Procontarinia fructiculi</i>	Gall midge
<i>Bactrocera facialis</i>	Tropical fruit fly, Tongan fruit fly	<i>Procontarinia frugivora</i>	Mango fruit gall midge
<i>Bactrocera kandiensis</i>	Fruit fly	<i>Procontarinia mangiferae</i> (syn. <i>Dasineura mangiferae</i> , <i>Erosomyia mangiferae</i> , <i>E. indica</i> , <i>Mangodiplosis mangiferae</i> , <i>Rhabdophaga mangiferae</i>)	Mango blossom gall midge
<i>Bactrocera kirki</i>	Fijian fruit fly	<i>Procontarinia matteiana</i>	Mango leaf gall midge
<i>Bactrocera melanotus</i>	Fruit fly, Cook Islands fruit fly	<i>Procontarinia pustulata</i>	Mango leaf gall midge
<i>Bactrocera occipitalis</i>	Fruit fly, Bezzi fruit fly	<i>Procontarinia schreineri</i>	Mango gall midge
<i>Bactrocera passiflorae</i>	Fijian fruit fly	<i>Rastrococcus invadens</i>	Mango mealybug
<i>Bactrocera psidii</i>	South Sea guava fruit fly	<i>Rhipiphorothrips cruentatus</i>	Grapevine thrips
<i>Bactrocera trilineola</i>	Vanuatu fruit fly	<i>Sternochetus frigidus</i>	Mango pulp weevil
<i>Bactrocera trivialis</i>	New Guinea fruit fly	<i>Thaumatotibia leucotreta</i> (syn. <i>Cryptophlebia leucotreta</i>)	False codling moth
<i>Bactrocera tuberculata</i>	Fruit fly	<i>Toxotrypana curvicauda</i> (syn. <i>Anastrepha curvicauda</i>)	Papaya fly
<i>Bactrocera xanthodes</i>	Pacific fruit fly	<i>Xylosandrus compactus</i>	Black twig borer
<i>Bactrocera zonata</i>	Peach fruit fly	<i>Zeugodacus curcurbitae</i> (syn. <i>Bactrocera cucurbitae</i>)	Melon fruit fly
<i>Batocera rubus</i>	Lateral-banded mango longhorn beetle		
<i>Batocera rufomaculata</i>	Red-spotted longhorn beetle		
<i>Ceratocystis fimbriata</i> sensu lato	Mango sudden decline syndrome, Ceratocystis blight		

MELONS

Represented by the Australian Melon Association
melonsaustralia.org.au

In 2017–18, melon production was valued at \$147 million (LVP), with exports valued at \$31.6 million. The main destinations for melon exports are New Zealand, United Arab Emirates, Malaysia, Hong Kong and Singapore.

The Australian melon industry consists of approximately 200 growers producing around 215,000 tonnes of melons annually, with the majority of production in Queensland, NT, WA and NSW. Fresh seedless watermelons, rockmelon, honeydew and Piel de Sapo melons are the major products and are produced all year round. The main form of value-adding is cut and wrapped fruit, fruit salad products and juices.

The Australian melon industry has a research and development (R&D) levy, a PHA levy and an Emergency Plant Pest Response levy, currently set at zero. The industry contributes funds to a Varroa mite emergency response and the Torres Strait Fruit Fly Strategy.

A Melon Farm Biosecurity Program is funded through the PHA levy to engage with growers on their biosecurity issues. In 2019 a melon farm biosecurity planner and 20 pest- and practice-specific fact sheets were developed and distributed to growers. A workshop in 2019 helped prepare growers and industry leaders to manage an emergency response and what would be required to allow their businesses to continue to operate in an incursion.

Figure 46. Annual value of melon production, 2010–18

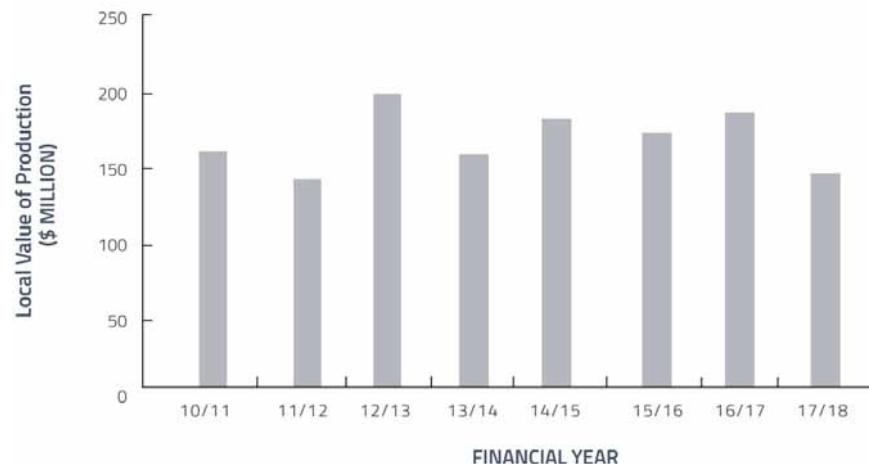
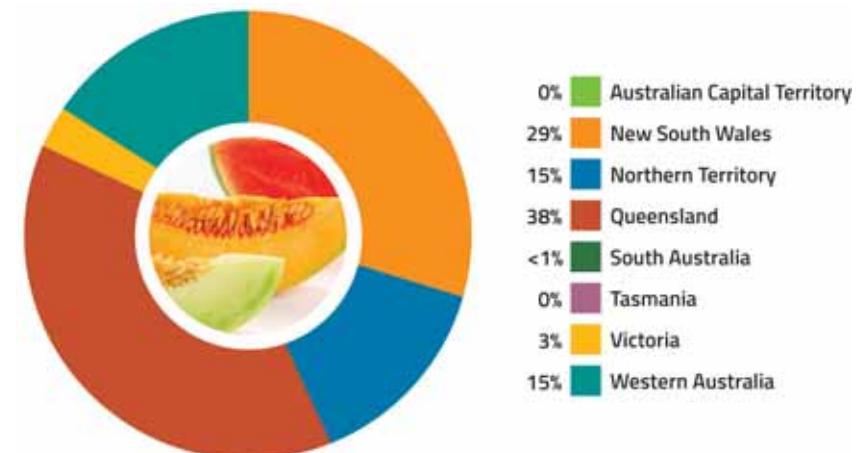


Table 26. High Priority Pests of the melon industry

Scientific name	Common name
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Bactrocera latifrons</i>	Solanum fruit fly
<i>Bemisia tabaci</i> (types Asia 1, China 1, China 2, Asia II (1-8), Italy, Sub-Saharan Africa (1-4), Uganda, New World, Mediterranean, Middle East–Asia Minor 2, Indian Ocean)	Silverleaf whitefly
<i>Erwinia tracheiphila</i>	Cucurbit bacterial wilt
<i>Fusarium oxysporum</i> f. sp. <i>melonis</i> (exotic races)	Fusarium root and stem rot of melons
<i>Fusarium oxysporum</i> f. sp. <i>niveum</i> (exotic races)	Fusarium root and stem rot of melons
<i>Fusarium oxysporum</i> f. sp. <i>radicis-cucumerinum</i>	Fusarium root and stem rot of melons
<i>Liriomyza bryoniae</i>	Tomato leaf miner
<i>Liriomyza huidobrensis</i>	Serpentine leaf miner
<i>Liriomyza sativae</i>	Vegetable leaf miner, American leaf miner
<i>Liriomyza trifolii</i>	American serpentine leaf miner
<i>Monosporascus cannonballus</i>	Monosporascus root rot
<i>Zeugodacus curvibitae</i> (syn. <i>Bactrocera cucurbitae</i>)	Melon fruit fly

Figure 47. Distribution of melon production by state and territory, 2017–18 (based on LVP)



OLIVES

Represented by the Australian Olive Association
australianolives.com.au

In 2017–18 Australian olive production was valued at \$63 million (LVP), with 125,000 tonne of fresh olives produced from 20,568 hectares of groves.

In 2019 production of olive oil was nearly 20,000 tonnes, or 20.8 million litres, up from 10.3 million litres in 2018, reflecting seasonal factors and olive trees tending to bear fruit biennially. Depending on seasonal conditions, production is typically between 85–95 per cent extra virgin olive oil.

During 2018–19 the olive industry exported around 2,384 tonne of olive products worth \$16.5 million. Olive oil accounted for 96 per cent of the exports, with table olives accounting for the rest. There are no measurable fresh olive exports. Major export markets for Australia are United States, China, NZ, Japan and Spain.

The Australian olive industry began in earnest in 1990 with the majority of large groves planted between 1996 and 2004. The industry is now regarded as mainstream agriculture and remains an important employer in regional Australia. In 2013 the industry began collecting a levy to fund research, development and extension projects.

Since the global financial crisis in 2013 new growers have purchased olive orchards and joined the association bringing renewed enthusiasm and vision. In more recent times there has also been significant replanting of established groves with more suitable varieties.

Figure 48. Annual value of olive production, 2007–18

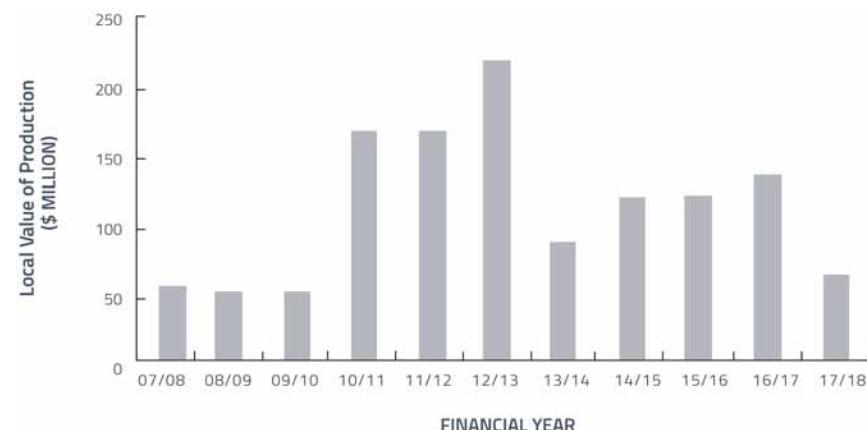


Table 27. High Priority Pests of the olive industry

Scientific name	Common name
<i>Bactrocera oleae</i>	Olive fly
<i>Prays oleae</i>	Olive moth
<i>Verticillium dahliae</i> (exotic defoliating strain)	Verticillium wilt
<i>Xylella fastidiosa</i> subsp. <i>multiplex</i>	No common name
<i>Xylella fastidiosa</i> subsp. <i>pauca</i>	Pierce's disease, blueberry leaf scorch, olive quick decline

Figure 49. Distribution of olive production by state and territory, 2017–18 (based on LVP)



ONIONS

Represented by Onions Australia
onionsaustralia.org.au

In 2017–18, onion production was valued at \$192 million (LVP) with fresh exports valued at \$21.7 million.

Onions are grown in most states, but SA and Tasmania together produce 66 per cent of the Australian crop. Key onion production locations are the Lockyer Valley in Queensland, north-eastern regions and the Adelaide Plains of SA and the Devonport–Launceston region of Tasmania. The total area planted to onions is largest in SA, as is the average plantings per farm.

The main type of onion grown in Australia is the traditional brown onion, which accounts for 79 per cent of fresh production. Onion production is during late spring, summer and autumn. Planting starts around April through to September, harvesting from August to March, and storage supplies the market for the winter months.

Figure 50. Annual value of onion production, 2007–18

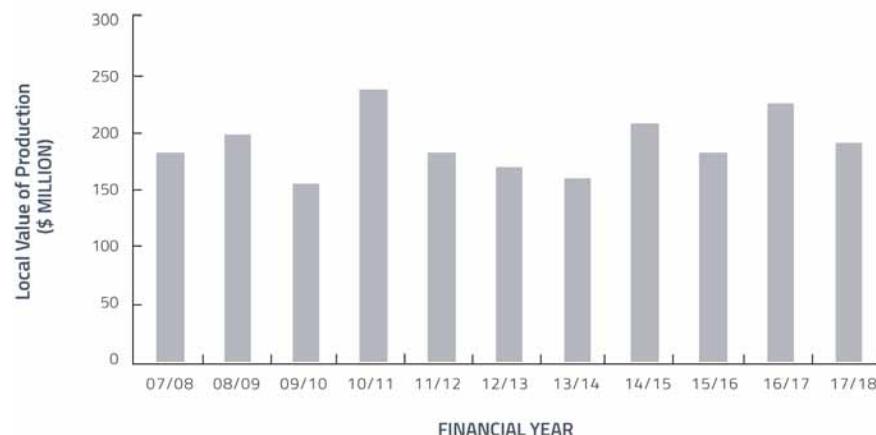
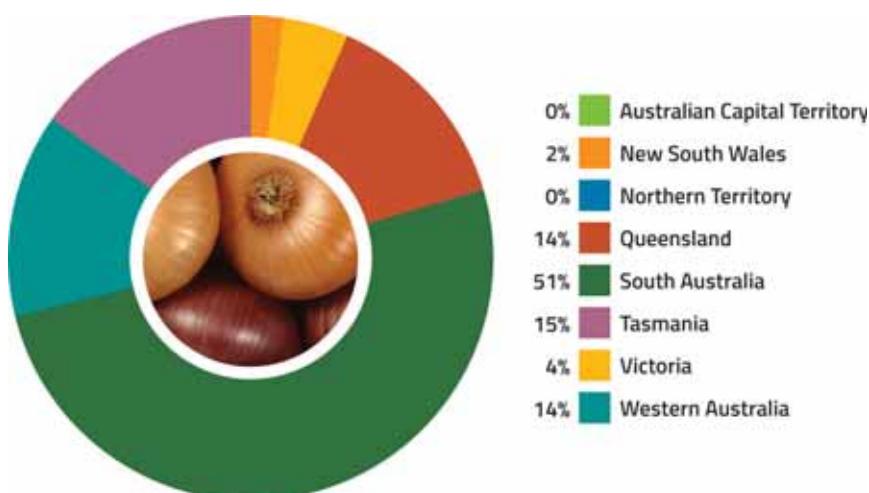


Table 28. High Priority Pests of the onion industry

Scientific name	Common name
<i>Botrytis squamosa</i>	Leaf blight
<i>Cladosporium allii</i> (syn. <i>C. allii-cepae</i> , <i>Heterosporium allii</i> , <i>Mycosphaerella allii</i>)	Leaf spot
<i>Delia antiqua</i>	Onion fly
<i>Delia florilega</i>	Bean fly
<i>Dickeya</i> spp. (onion infecting exotic pathovars) syn. <i>Erwinia chrysanthemi</i>	Bacterial soft rot
<i>Liriomyza sativae</i>	Vegetable leaf miner, American leaf miner
<i>Meloidogyne enterolobii</i> (syn. <i>M. mayaguensis</i>)	Root knot nematode
<i>Puccinia allii</i> ('Koike's race')	Rust of garlic and chives
<i>Puccinia mixta</i>	Rust of chives
<i>Puccinia porri</i>	Rust of leek
<i>Thrips tabaci</i> (exotic strains, biotypes)	Onion thrip
<i>Urocystis cepulae</i>	Onion smut
<i>Xanthomonas axonopodis</i> pv. <i>allii</i>	Xanthomonas leaf blight

Figure 51. Distribution of onion production by state and territory, 2017–18 (based on LVP)



PASSIONFRUIT

Represented by Passionfruit Australia
passionfruitaustralia.org.au

In 2017–18, passionfruit production of 4,790 tonnes of fruit was valued at \$17 million (LVP). At present, there is a minimal amount of passionfruit exported.

There is currently around 280 hectares of passionfruit under cultivation in Australia with around 375,000 passionfruit vines. About 60 per cent of the Australian passionfruit crop is grown in Queensland, and around one third in NSW. The industry is starting to expand in WA, and there are new plantings in the NT and Victoria.

Passionfruit is grown year-round, but main market supply time is December through to September. The main purple passionfruit varieties grown are Misty Gem and Sweetheart, and the major Panama passionfruit varieties are Pandora and Panama Red. A National Breeding Program is continuing with the goal of developing new commercial varieties in the next five years. New varieties bred in the NT designed for tropical regions are also in the process of being commercialised.

Table 29. High Priority Pests of the passionfruit industry

Scientific name	Common name
<i>Bactrocera carambolae</i>	Carambola fruit fly
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Bactrocera facialis</i>	Tropical fruit fly, Tongan fruit fly
<i>Bactrocera kandiensis</i>	Fruit fly
<i>Bactrocera kirki</i>	Fijian fruit fly
<i>Bactrocera melanotus</i>	Fruit fly, Cook Islands fruit fly
<i>Bactrocera passiflorae</i>	Fijian fruit fly
<i>Bactrocera psidii</i>	South Sea guava fruit fly
<i>Bactrocera xanthodes</i>	Pacific fruit fly
<i>East Asian passiflora virus</i> (Potyvirus)	East Asian passiflora virus
<i>Passiflora chlorosis virus</i> (Potyvirus)	Passiflora chlorosis virus
<i>Passifruit crinkle virus</i> (Potyvirus)	Passifruit crinkle virus
<i>Passifruit ringspot virus</i> (Potyvirus)	Passifruit ringspot virus
<i>Passifruit severe leaf distortion virus</i> (Begomovirus)	Passifruit severe leaf distortion virus
<i>Passifruit Sri Lankan mottle virus</i> (Potyvirus)	Passifruit Sri Lankan mottle virus
<i>Passifruit vein clearing virus</i> (Rhabdovirus)	Passifruit vein clearing virus
<i>Passifruit yellow mosaic virus</i> (Tymovirus)	Passifruit yellow mosaic virus
<i>Xanthomonas axonopodis</i> pv. <i>passiflorae</i>	Bacterial blight
<i>Zeugodacus curcumiae</i> (syn. <i>Bactrocera cucurbitae</i>)	Melon fruit fly

Figure 52. Annual value of passionfruit production, 2007–18

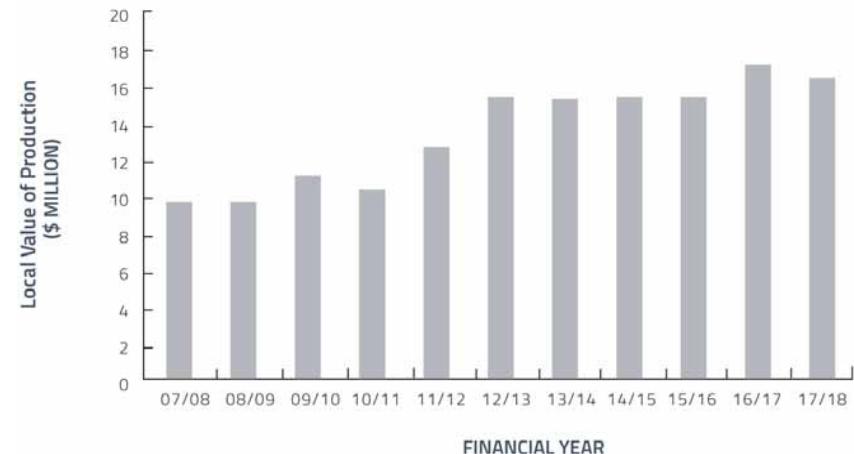
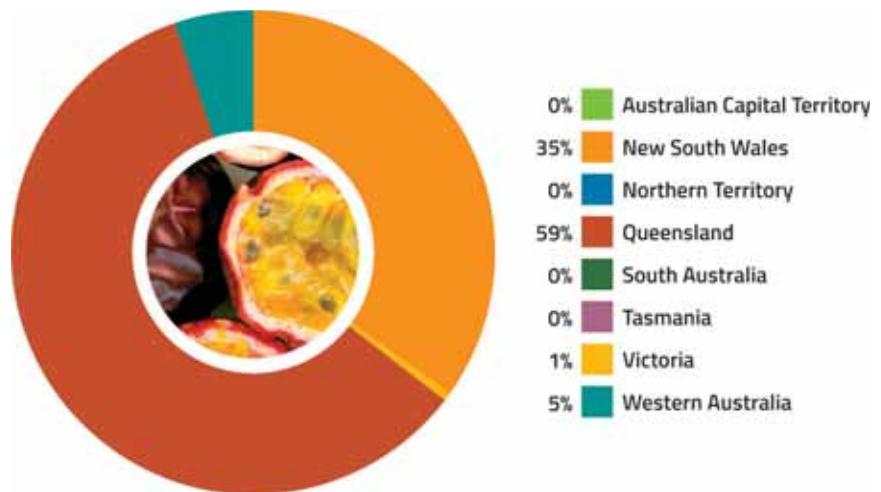


Figure 53. Distribution of passionfruit production by state and territory, 2017–18 (based on LVP)



PINEAPPLES

Represented by GROWCOM
growcom.com.au

In 2017–18, pineapple production was valued at \$49 million (LVP). The industry estimates that in 2019 around 43,400 tonnes of fresh fruit and 23,500 tonnes of processed fruit were marketed. The farm gate value for fresh fruit is \$1,584 per tonne and the average price for processed fruit is \$352 per tonne.

There are approximately 75 commercial pineapple enterprises, all but one based in Queensland. Key growing districts are in Wamuran, Elimbah, Glasshouse Mountains, Beerwah, Yandina, Maryborough, Hervey Bay, Childers, Bundaberg, Cawarral, Yeppoon, Rollingstone, Mutarnee, Bilyana and Mareeba, with one commercial farm located just outside Darwin in the NT.

Australia produces less than one per cent of the world's fresh pineapple but supplies almost the entire domestic market. Four primary packing houses pack and market more than 70 per cent of fresh pineapples. The primary pineapple processor, Heinz Golden Circle Ltd, produces canned pineapple and juice, accounting for 91 per cent of processed fruit.

Approximately 69 per cent of pineapple varieties grown are Smooth Cayenne. The remaining 31 per cent of plantings are hybrid varieties that appeal more to the fresh market and this proportion is expected to increase.

Table 30. High Priority Pests of the pineapple industry

Scientific name	Common name
<i>Cotinis mutabilis</i>	Fig beetle
<i>Dickeya</i> spp. (pineapple infecting strains) (syn. <i>Erwinia chrysanthemi</i>)	Bacterial fruit collapse, bacterial heart rot
<i>Dysmicoccus neobrevipes</i>	Grey pineapple mealybug
<i>Fusarium</i> spp. (<i>F. ananatum</i> and <i>F. guttiforme</i> syn. <i>F. subglutinans</i> f. sp. <i>ananas</i>)	Fusariosis, fusarium stem rot, pineapple eye rot, fruitlet core rot
<i>Strymon megarus</i> (as a vector of fusariosis)	Pineapple fruit borer
<i>Thaumatotibia leucotreta</i> (syn. <i>Cryptophlebia leucotreta</i>)	False codling moth

Figure 54. Annual value of pineapple production, 2007–18

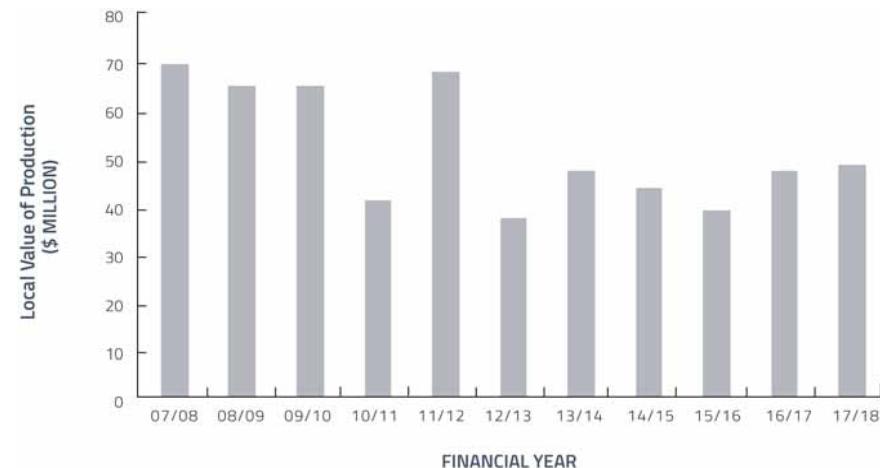
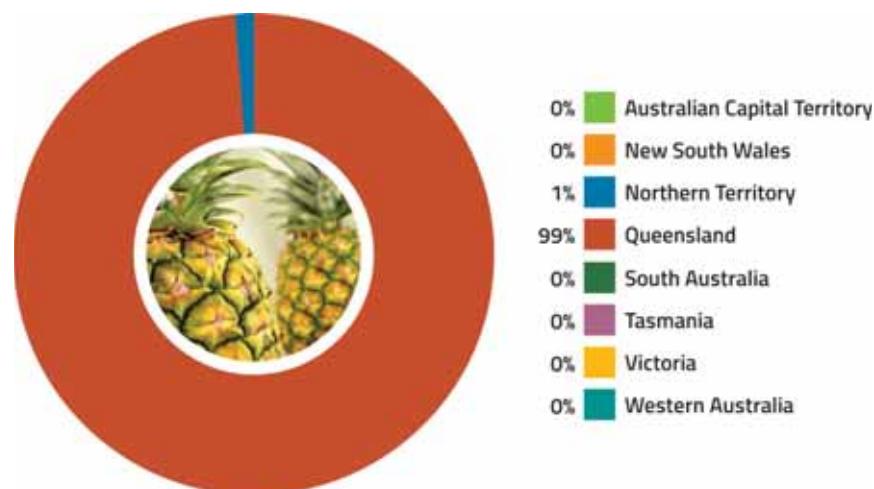


Figure 55. Distribution of pineapple production by state and territory, 2017–18 (based on LVP)



PISTACHIOS

Represented by the Pistachio Growers' Association

pgai.com.au

In 2017–18, pistachio production was valued at \$42 million (LVP), with exports valued at \$1.4 million.

In 2019, there was 1,300 hectares under cultivation, producing a record 2,300 tonnes of pistachio nuts. Major production areas are along the Murray River Valley between Swan Hill in Victoria and Waikerie in SA. Further plantings are in central-west Victoria and Pinnaroo, SA, with small plantings in WA. 180 hectares of new orchards were planted in 2018, 200 in 2019, and an estimated 240 are expected in 2020, a total of 1,165 new hectares since 2014. These new orchards are not yet in production. There are five large pistachio orchards and another five orchards of 10 to 15 hectares. Around 20 mixed fruit growers each produce less than five tonnes of pistachios (dry) per annum from one to five hectares.

Australian pistachio production currently meets only 50 per cent of domestic consumption, with the remainder imported from other major producers including Iran and the United States. The domestic production of pistachio is expected to increase to 4,000 tonnes (rolling average of two seasons) by 2021 and to 10,000 tonnes by 2030.

In 2019, the Pistachio Growers' Association participated in responses to pest incursions. Biosecurity is a priority for the industry, with aspects of biosecurity embedded in the Australian Pistachio Industry Five Year Strategic Plan – 2015 to 2020, and in two Hort Innovation research projects: Understanding and managing insects on pistachio orchards (PS16000) and Pathogens and other factors contributing to dark staining on pistachio shells (PS16002). The industry is represented at PHA meetings and government Biosecurity Roundtables.

Table 31. High Priority Pests of the pistachio industry

Scientific name	Common name
<i>Amyelois transitella</i>	Navel orange worm
<i>Chinavia hilaris</i> (syn. <i>C. hilare</i>)	Green stink bug
<i>Leptoglossus clypealis</i>	Leaf footed bug
<i>Leptoglossus occidentalis</i>	Western conifer seed bug
<i>Leptoglossus zonatus</i>	Western leaf footed bug
<i>Lymantria dispar</i>	Gypsy moth (Asian and European strains)
<i>Trogoderma granarium</i>	Khapra beetle
<i>Verticillium dahliae</i> (exotic defoliating strains)	Verticillium wilt

Figure 56. Annual value of pistachio production 2008–18

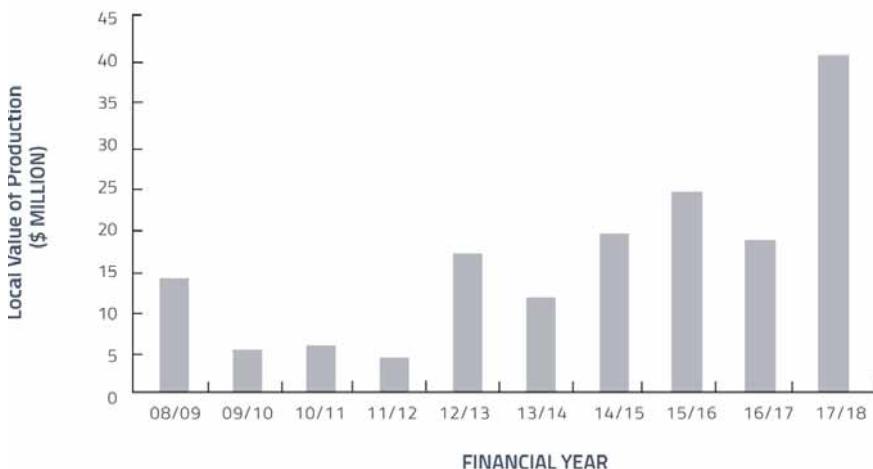
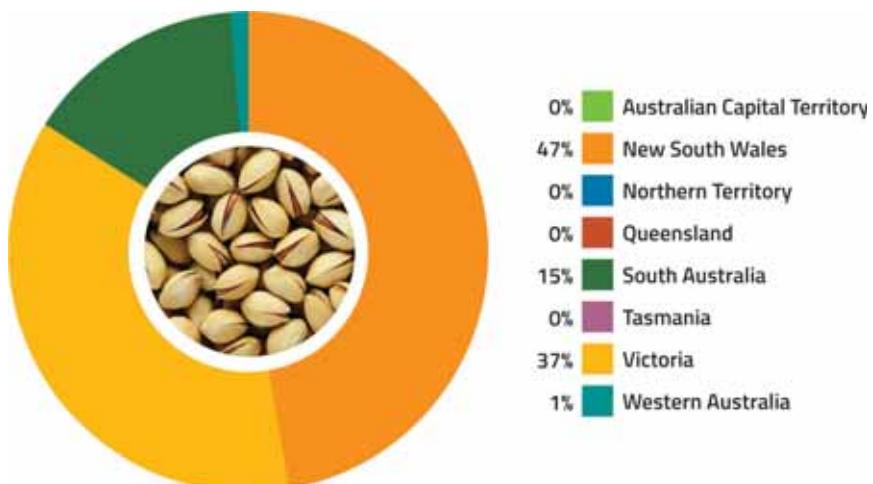


Figure 57. Distribution of pistachios by state and territory, 2017–18 (based on LVP)



PROCESSING TOMATOES

Represented by the Australian Processing Tomato Research Council
aptrc.asn.au

In 2017–18, Australian processing tomato production was valued at approximately \$20.3 million (LVP). A total of 211,961 tonnes of tomatoes were delivered to three processors, a seven per cent decline from the previous year. All of the 2,347 planted hectares were harvested, despite a severe outbreak of bacterial speck disease early in the season due to weather conditions.

Heinz varieties make up the bulk of crops grown in Australia. Most crops are transplanted, and for the first time, 100 per cent of the production area was irrigated using sub-surface drip lines.

Australia consumes around 605,000 tonnes of processed tomatoes, with local production supplying approximately one third of this demand. The majority of imports come from Italy and the United States.

Figure 58. Annual value of processing tomato production, 2007–18

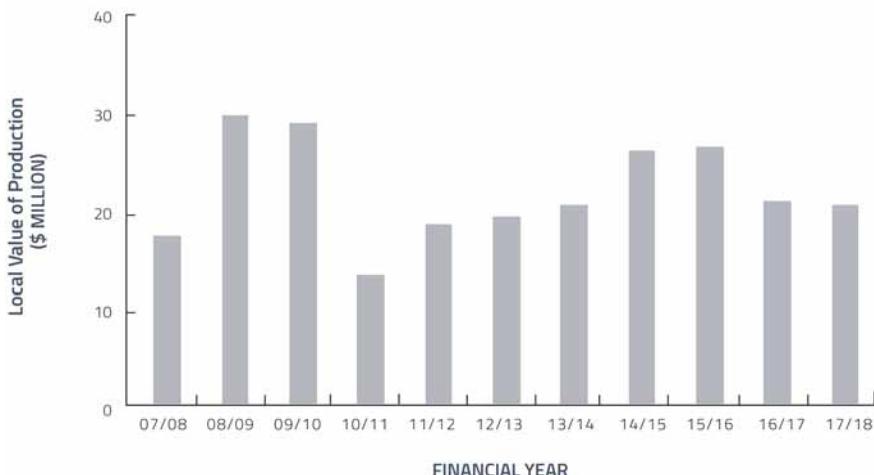


Table 32. High Priority Pests of the processing tomato industry

Scientific name	Common name
<i>Bactericera cockerelli</i> *	Tomato potato psyllid
<i>Candidatus Liberibacter solanacearum</i> (syn. <i>Candidatus Liberibacter psyllaorous</i>)	Zebra chip
<i>Frankliniella intonsa</i>	Flower thrips
<i>Liriomyza bryoniae</i>	Tomato leaf miner
<i>Liriomyza huidobrensis</i>	Serpentine leaf miner
<i>Liriomyza sativae</i>	Vegetable leaf miner, American leaf miner
<i>Liriomyza trifolii</i>	American serpentine leaf miner
<i>Lissachatina fulica</i> (syn. <i>Achatina fulica</i>)	Giant African snail
<i>Tuta absoluta</i>	South American tomato moth, tomato leaf miner

*established in Australia

Figure 59. Distribution of processing tomato production by state and territory, 2017–18 (based on LVP)

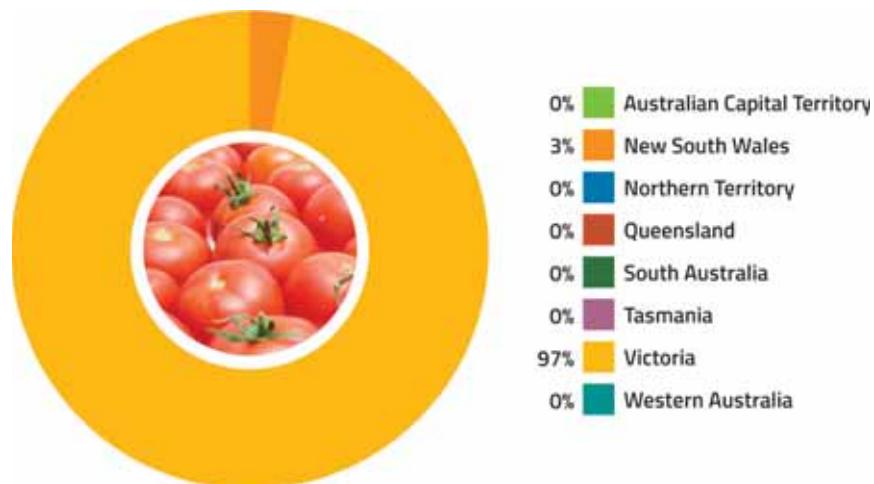




Image courtesy of Greenlife Industry Australia

PRODUCTION NURSERIES

Represented by **Greenlife Industry Australia**
greenlifeindustry.com.au

In 2017–18, nursery production (propagation stock, vegetable and forestry seedlings, bedding plants, indoor plants, fruit and landscape trees and shrubs) was valued at \$1 billion (LVP). The industry has a limited export focus of approximately \$18 million annually, however there is ample opportunity for international export growth.

The nursery industry operates in all states and territories, being one of the largest and most diverse plant industries in Australia. The industry estimates an annual gross production value of approximately \$2.5 billion (production nurseries only) will occur in 2020 across the entire supply chain. Greenlife member nurseries supply to ornamental retail, landscape, revegetation, rehabilitation and production horticulture sectors including tree crops (e.g. fruit, vines, tea tree), vegetables, forestry and cut flowers with a combined annual production value of more than \$15 billion.

In 2016, Nursery Garden Industry Australia, NGIA (now Greenlife Industry Australia) developed the Australian Plant Production Standard website nurseryproductionfms.com.au which is the one-stop shop for industry biosecurity information for growers, including access to pest fact sheets, management plans, videos and an eLearning portal.

In early 2018, Greenlife Industry Australia achieved certification and recognition of BioSecure HACCP as an Approved Biosecurity Scheme under the Queensland *Biosecurity Act 2014*, the first such recognition of a third party certification program in Australia. This was followed by NSW providing equivalent certification under the NSW *Biosecurity Act 2015* in late December 2018.

Greenlife Industry Australia continues to work in partnership with state and territory governments on the roll out of BioSecure HACCP, with legal recognition for market access achieved in Queensland, NSW, Victoria, Tasmania, SA and WA by the end of 2019. This allows certified producers to self-certify consignments of nursery stock for interstate market access and issue BioSecure HACCP Biosecurity Certificates.

The industry continues to build the online electronic plant pest identification resource Pest ID Tool pestid.com.au which combines information and images on endemic and key exotic plant pests that impact on production or trade.

Figure 60. Annual value of production nurseries, 2007–18

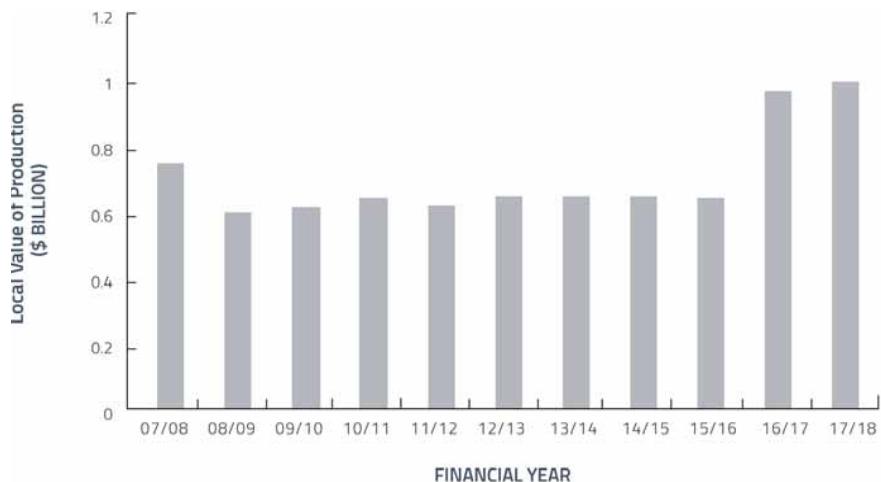


Figure 61. Distribution of production nurseries by state and territory, 2017–18
(based on LVP)

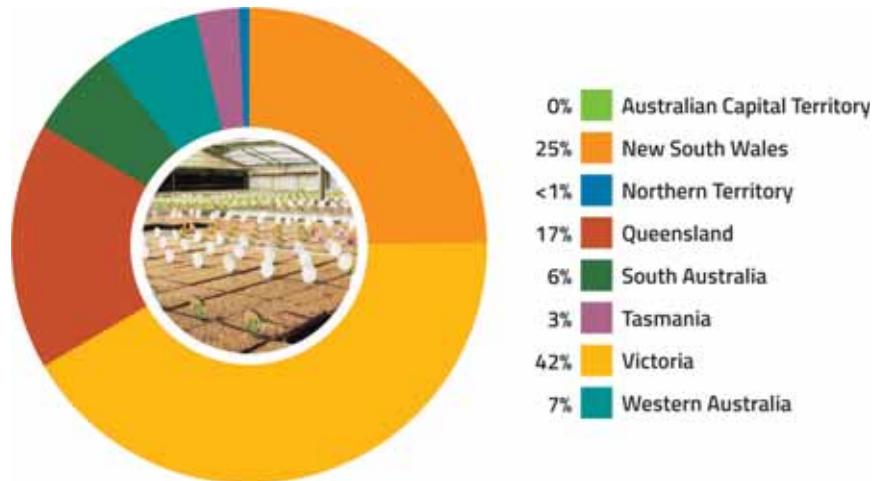


Table 33. High Priority Pests of the production nursery industry

Scientific name	Common name
<i>Aphis gossypii</i> (exotic strains)	Cotton aphid
<i>Austropuccinia psidii</i> sensu lato (exotic variants) (syn. <i>Puccinia psidii</i>)	Myrtle rust, guava rust, Eucalyptus rust
<i>Bemisia tabaci</i> (types Asia 1, China 1, China 2, Asia II (1–8), Italy, Sub-Saharan Africa (1–4), Uganda, New World, Mediterranean, Middle East–Asia Minor 2, Indian Ocean)	Silverleaf whitefly
<i>Candidatus Liberibacter asiaticus</i>	Huanglongbing (Asiatic strain)
<i>Diaphorina citri</i>	Asian citrus psyllid
<i>Echinothrips americanus</i>	Poinsettia thrips
<i>Homalodisca vitripennis</i> (syn. <i>H. coagulata</i>)	Glassy winged sharpshooter
<i>Lettuce infectious yellows virus</i> (<i>Crinivirus</i>)	Lettuce infectious yellows virus
<i>Liriomyza huidobrensis</i>	Serpentine leaf miner
<i>Lissachatina fulica</i> (syn. <i>Achatina fulica</i>)	Giant African snail
<i>Lygus lineolaris</i>	Tarnished plant bug
<i>Lymantria dispar</i>	Asian gypsy moth
<i>Oligonychus ilicis</i>	Southern red mite
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Pomacea canaliculata</i>	Golden apple snail
<i>Pseudomonas syringae</i> pv. <i>syringae</i> (exotic races)	Bacterial canker
<i>Xylella fastidiosa</i> (subsp. not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald



Image courtesy of Greenlife Industry Australia

RICE

Represented by the Ricegrowers' Association of Australia
rga.org.au

In 2017–18, rice production was valued at \$228 million (LVP), with the export value estimated at \$368m.²⁷

The Australian rice industry is predominantly located in the temperate climatic region of the Riverina in southern NSW, with a small amount grown in northern NSW and an emerging production area in north Queensland and NT. In NSW over 938 farms produced a total of 625,812 tonnes of rice.

In the Riverina, the major varieties grown are temperate Japonica varieties planted in October and November that are harvested from March to May of the following year.

The rice industry is conducting research into suitable varieties and management techniques to maximise water efficiency and allow production in north Queensland. Strict biosecurity measures have been put in place to ensure that any pests endemic in northern Australia are not spread south to the major rice growing area in NSW.

Table 34. High Priority Pests of the rice industry

Scientific name	Common name
<i>Lissorhoptrus oryzophilus</i>	Rice water weevil
<i>Magnaporthe grisea</i>	Rice blast
<i>Pomacea canaliculata</i>	Golden apple snail
<i>Rice grassy stunt virus</i> (<i>Tenuivirus</i>)	Rice grassy stunt virus
<i>Rice ragged stunt virus</i> (<i>Oryzavirus</i>)	Ragged stunt virus
<i>Rice tungro bacilliform virus</i> (unassigned)	Rice tungro bacilliform virus
<i>Rice tungro spherical virus</i> (<i>Waikavirus</i>)	Rice tungro spherical virus, Waikavirus
<i>Trogoderma granarium</i>	Khapra beetle

Figure 62. Annual value of rice production, 2007–18

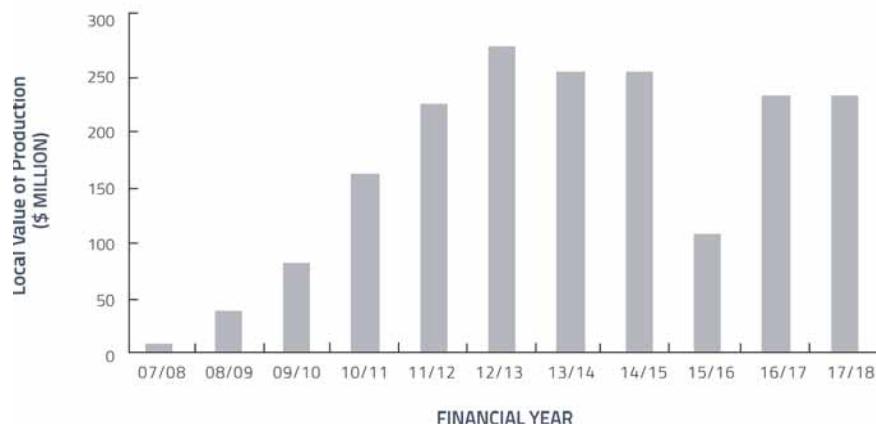


Figure 63. Distribution of rice production by state and territory, 2017–18 (based on LVP)



27. Australian Bureau of Agricultural Resource Economics and Sciences. Agricultural commodities: June quarter 2019 Accessed online 25 March 2020 agriculture.gov.au/abares/research-topics/agricultural-commodities/jun-2019

RUBUS

Represented by Raspberries and Blackberries Australia (RABA)
freshberries.com.au

In 2017–18, the rubus industry was valued at \$176 million (LVP), with fresh exports valued at less than \$100,000.

Raspberry, blackberry and hybrid brambles (including silvanberries, boysenberries, loganberries, youngberries and marionberries) are collectively referred to as rubus or cane berries. Raspberries are the most popular accounting for 85 per cent of fresh production, followed by blackberries at 14 per cent and other hybrid brambles consisting of one per cent fresh production.

While most raspberries, blackberries and brambleberries produced are consumed locally, berries are also exported to Singapore, Hong Kong, India, Indonesia and Pacific Island countries. There is approximately 700 hectares of land under cultivation with rubus varieties: production is largely under protected cropping (white plastic tunnels) to protect from wind and rain. New plantings continue in response to increasing demand from consumers. Production is expanding in newer areas such as Gin Gin, north of Perth in WA, and Stanthorpe, south-east of Brisbane.

Traditionally rubus are a cool temperate crop with peak production in early summer to autumn. However, year-round supply is possible from subtropical NSW and south-east Queensland production sites where harvest occurs late autumn to spring. Hydroponic systems, new low-chill rubus varieties and production methods to simulate winter extend the harvest season and productivity.

Figure 64. Annual value of rubus berry production, 2009–18

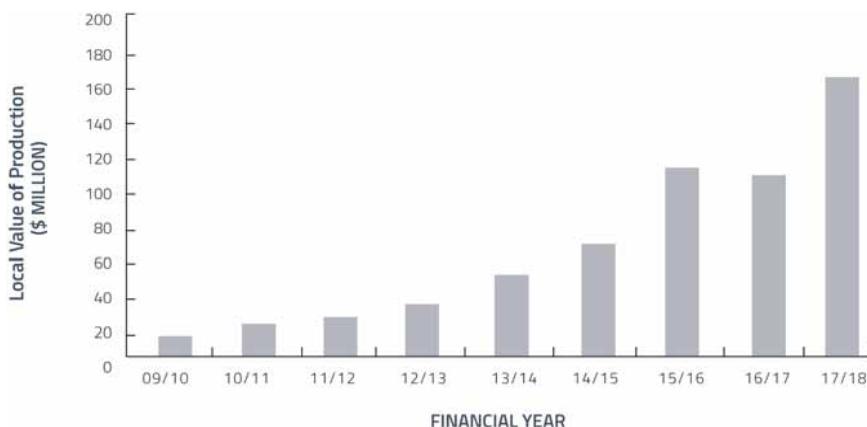
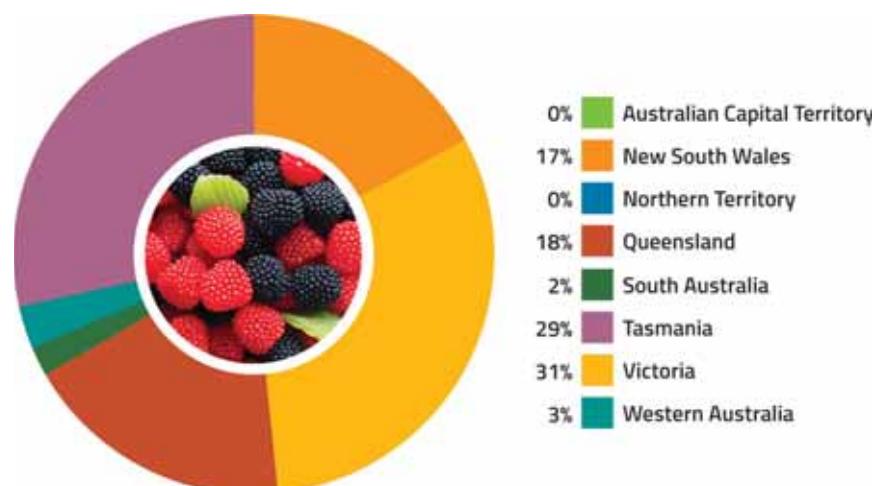


Table 35. High Priority Pests of the rubus industry

Scientific name	Common name
<i>Arthuriomyces peckianus</i>	Orange rust (long-cycled)
<i>Cercosporaella rubi</i>	Rosette
<i>Cherry leaf roll virus</i> (<i>Nepovirus</i>) (exotic strains)	Blackline
<i>Drosophila suzukii</i>	Spotted wing drosophila
<i>Euschistus conspersus</i>	Consperser stink bug
<i>Gymnoconia nitens</i>	Orange rust (short-cycled)
<i>Halyomorpha halys</i>	Brown marmorated stink bug
<i>Heterocrossa rubophaga</i>	Raspberry bud moth
<i>Pennisetia hylaeiformis</i>	Raspberry crown borer
<i>Pennisetia marginata</i>	Raspberry crown borer
<i>Popillia japonica</i>	Japanese beetle
<i>Raspberry ringspot virus</i> (<i>Nepovirus</i>)	Raspberry ringspot virus
<i>Strawberry latent ringspot virus</i> (<i>Sadwavirus</i>)	Strawberry latent ringspot virus
<i>Tomato ringspot virus</i> (<i>Nepovirus</i>)	Tomato ringspot virus

Figure 65. Distribution of rubus berry production by state and territory, 2017–18 (based on LVP)



STONE FRUIT

Represented by Summerfruit Australia
summerfruit.com.au

In 2017–18, stone fruit production (fresh apricots, nectarines, peaches and plums) was valued at \$207 million (LVP), with exports valued at \$65.1 million.

Nectarines and peaches comprised two thirds of national stone fruit production, followed by plums and apricots. Production is mainly located in subtropical and temperate Australia where the industry is a major rural and regional employer. Victoria produces around 75 per cent of Australia's stone fruit (161,000 tonnes nationally) with the remaining production spread between NSW, Queensland, SA, WA and Tasmania.

Increased summerfruit exports have been driven by demand from China. Market access to mainland China for nectarines (in May 2016) and apricots, peaches and plums (in November 2017) allowed an expansion of exports. During the 2018–19 export season, a record 23,013 tonnes were exported (an increase of 30 per cent), with 12,000 tonnes going to China and Hong Kong. Other major markets were United Arab Emirates, Saudi Arabia, Singapore and Malaysia.

In 2019, Summerfruit Australia was involved in a number of responses to pest incursions affecting the stone fruit industry, including detections of brown marmorated stink bug in cargo, Varroa mite and exotic fruit fly. The industry also updated their biosecurity plan with PHA and governments.

Table 36. High Priority Pests of the stone fruit industry

Scientific name	Common name
<i>Anastrepha ludens</i>	Mexican fruit fly
<i>Anastrepha serpentina</i>	Sapodilla fruit fly, sapote fruit fly
<i>Anastrepha striata</i>	Guava fruit fly
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Drosophila suzukii</i>	Spotted wing drosophila
<i>Halymorpha halys</i>	Brown marmorated stink bug
<i>Homalodisca vitripennis</i> (syn. <i>H. coagulata</i>)	Glassy winged sharpshooter
<i>Lymantria dispar</i>	Asian gypsy moth
Plum pox virus (Potyvirus)	Plum pox virus, sharka
<i>Xylella fastidiosa</i> (subsp. not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald

Figure 66. Annual value of stone fruit production, 2007–18

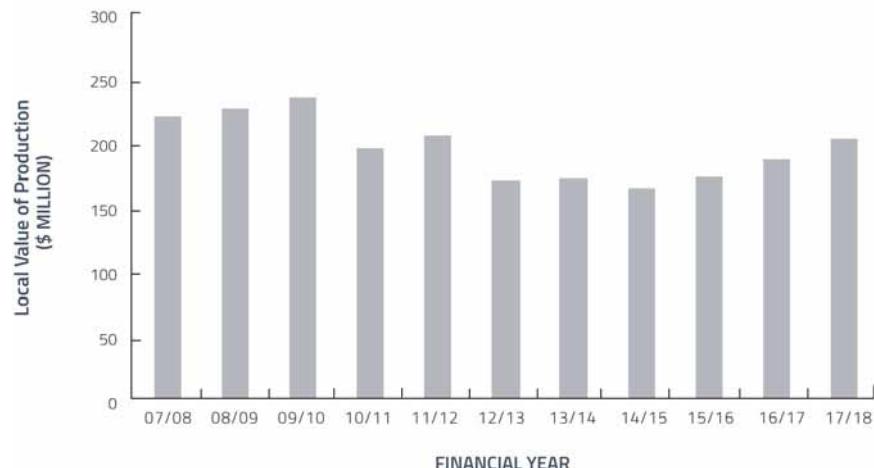
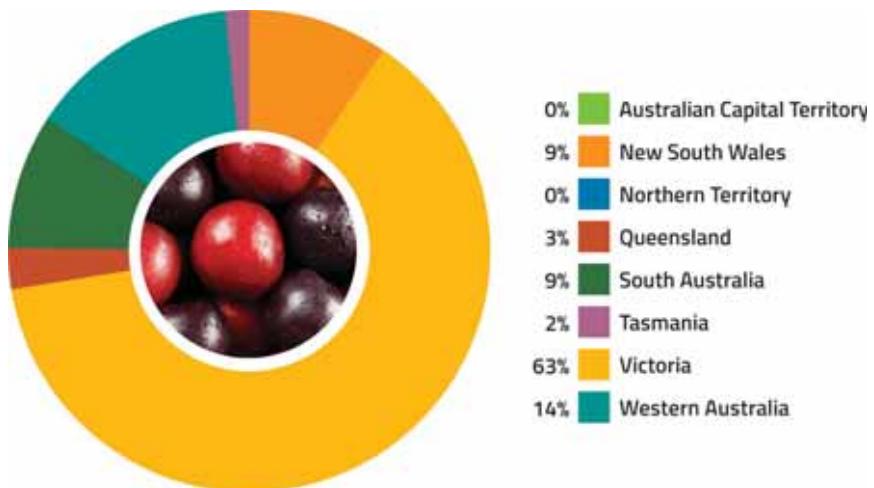


Figure 67. Distribution of stone fruit production by state and territory, 2017–18 (based upon LVP)



STRAWBERRIES

Represented by Strawberries Australia
strawberriesaustralia.com.au

In 2017–18, strawberry production was valued at \$303 million (LVP) with exports valued at \$29.7 million. The increase in production over recent years is due primarily to rising per capita consumption, driven by higher planting numbers, improved varieties and better cool chain management.

Although primarily focused on the domestic market, in 2017–18 the industry exported approximately five per cent of production to United Arab Emirates, New Zealand, Singapore, Thailand and Hong Kong.

Strawberries are grown in all states of Australia (except the ACT and NT) by an estimated 500 growers. Production is concentrated in the Sunshine Coast area of Queensland, and the Yarra Valley and the Mornington Peninsula in Victoria, with other production areas in Wannaroo, Bullsbrook and Albany in WA, the Adelaide Hills in SA, and Tasmania.

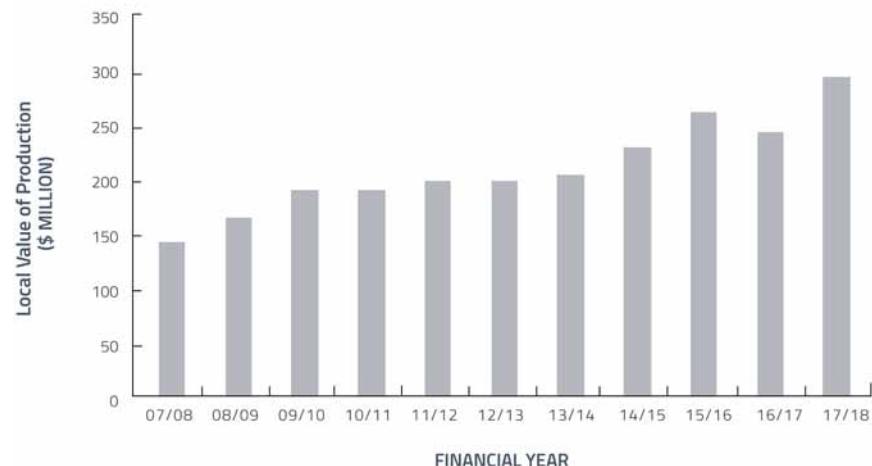
Strawberries are grown in Australia throughout the year, with production in subtropical regions from May to October, and in temperate regions from October to June.

In temperate regions, the varieties grown are predominantly from California in the United States, with some Australian bred varieties. In subtropical regions, Australian bred varieties are increasingly being grown, with some varieties imported from Florida in the United States. There is continued industry investment in a national breeding program, and in the 2017–18 season approximately 30 per cent of all varieties grown nationally were bred in Australia.

Table 37. High Priority Pests of the strawberry industry

Scientific name	Common name
<i>Lygus hesperus</i>	Western plant bug
<i>Lygus lineolaris</i>	Tarnished plant bug
<i>Phytophthora fragariae</i> var. <i>fragariae</i>	Red steele root rot
<i>Raspberry ringspot virus</i> (Nepovirus)	Raspberry ringspot virus
<i>Tomato black ring virus</i> (Nepovirus)	Tomato black ring virus
<i>Tomato ringspot virus</i> (Nepovirus)	Tomato ringspot virus
<i>Xanthomonas fragariae</i>	Strawberry angular leaf spot

Figure 68. Annual value of strawberry production, 2007–18



**Figure 69. Distribution of strawberry production by state and territory, 2017–18
(based upon LVP)**

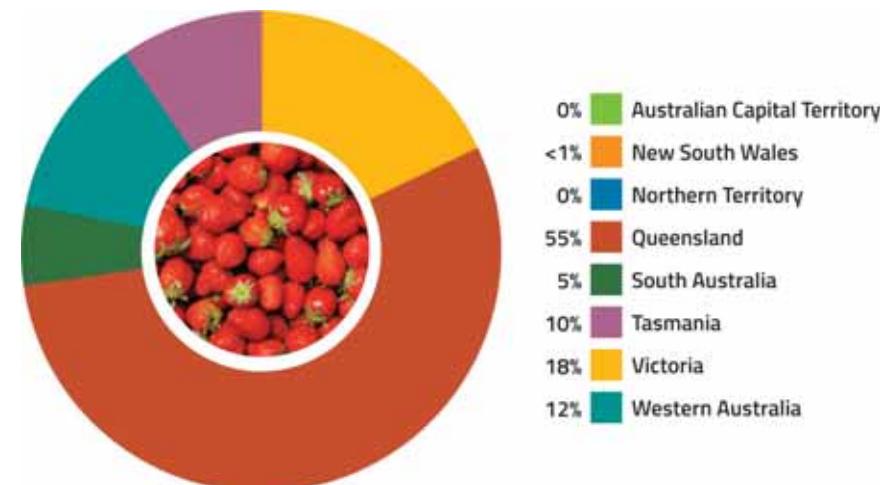




Image courtesy of CANEGROWERS

SUGARCANE

Represented by **CANEgrowERS**
canegrowers.com.au

In 2017–18, sugarcane production was valued at \$1.25 billion (LVP).

In 2018, the industry produced 32.5 million tonnes of cane, and 4.72 million tonnes of processed sugar.

Australia's sugarcane is grown in high rainfall and irrigated areas along coastal plains and river valleys on 2,100 km of Australia's eastern coastline between Mossman in far north Queensland and Grafton in NSW. Queensland accounts for about 95 per cent of Australia's raw sugar production.

Australia is the world's third largest exporter of raw sugar, with approximately 80 per cent of production sold to international markets. Major export customers include east Asia, China, Indonesia, Japan, Korea, Malaysia, Taiwan, the United States and New Zealand.



Figure 70. Annual value of sugarcane production, 2007–18

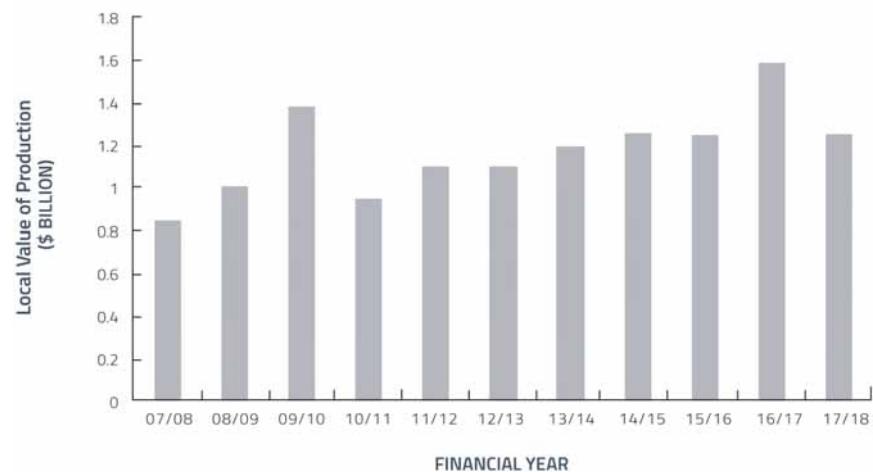


Figure 71. Distribution of sugarcane production by state and territory, 2017–18
(based upon LVP)

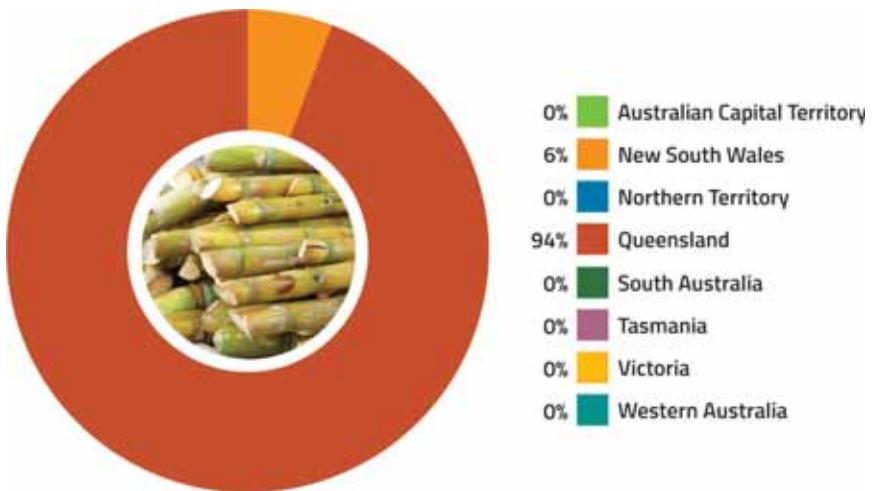


Table 38. High Priority Pests of the sugarcane industry

Scientific name	Common name
<i>Aleurolobus barodensis</i>	Sugarcane whitefly
<i>Ceratovacuna lanigera</i>	Sugarcane woolly aphid
<i>Chilo auricilius</i>	Sugarcane internode borer
<i>Chilo infuscatus</i>	Yellow top borer of sugarcane
<i>Chilo sacchariphagus</i>	Sugarcane internode borer
<i>Chilo terrenellus</i>	Sugarcane stem borer
<i>Chilo tumidicostalis</i>	Spotted sugarcane stem borer
<i>Eldana saccharina</i>	African sugarcane stalkborer
<i>Eumetopina flavipes</i>	Sugarcane leafhopper (as a vector of Ramu stunt disease)
Grassy shoot phytoplasma	Grassy shoot
<i>Perkinsiella vastatrix</i>	Sugarcane planthopper
<i>Perkinsiella vitiensis</i>	Sugarcane planthopper
<i>Peronosclerospora philippinensis</i>	Philippine downy mildew of maize
<i>Peronosclerospora sacchari</i>	Sugarcane downy mildew
<i>Polyocha depressella</i>	Root borer
<i>Pyrilla perpusilla</i>	Sugarcane pyrilla
<i>Scirphophaga excerptalis</i>	Top shoot borer
<i>Sesamia grisescens</i>	Stem borer
<i>Stagonospora sacchari</i>	Leaf scorch
<i>Sugarcane streak mosaic virus (Poacevirus)</i>	Sugarcane streak mosaic
Unknown	Ramu stunt disease
White leaf phytoplasma	White leaf
<i>Xanthomonas albilineans</i> (exotic strains, serological groups 2 or 3)	Leaf scald

SWEETPOTATOES

Represented by Australian Sweetpotato Growers

aspg.com.au

In 2017–18, sweetpotato production was valued at \$99 million (LVP), with exports valued at \$1.6 million. The main export markets are United Arab Emirates, Hong Kong and Singapore.

Sweetpotatoes are available all year round in Australia with total production of around 96,000 tonnes. There are around 80 commercial producers with farm sizes ranging from 10 to 200 hectares, with most in the 15 to 80 hectare range.

Queensland is the biggest producer with 88 per cent of production, mainly around Bundaberg. The second major production area is around Cudgen in northern NSW. Sweetpotatoes are also grown in Mareeba, Atherton and Rockhampton in Queensland; Murwillumbah in NSW; and Perth, Carnarvon and Kununurra in WA.

Four types of sweetpotato are grown in Australia, categorised by skin and flesh colour. The gold variety (rose-gold skin, gold flesh) dominates the Australian sweetpotato industry with over 90 per cent of production. Red category (red skin, white flesh) makes up around eight per cent, with purple (white skin, purple flesh) and white (white skin, white flesh) making up the remainder. The majority of sweetpotato production is consumed domestically, with around 1.5 per cent exported.

Commercial growers purchase pathogen-tested planting material several times every year, a measure that has doubled marketable yield per hectare. This scheme supports biosecurity by constraining what was previously a pest movement risk between farms. The pathogen testing scheme is reinforced by a major research program into nematode diagnostics and management, as well as ongoing development of diagnostics for viruses and other endemic and exotic pests.

In 2019, the sweetpotato industry developed a biosecurity plan with PHA and governments.

Figure 72. Annual value of sweetpotato production, 2011–18

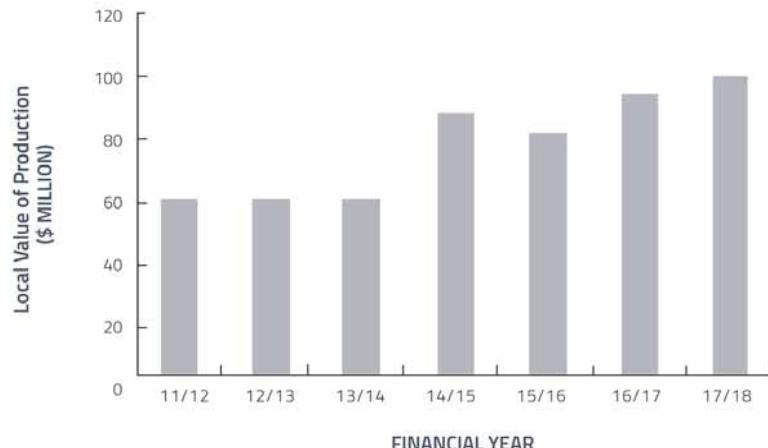


Table 39. High Priority Pests of the sweetpotato industry

Scientific name	Common name
<i>Achatina achatina</i>	Giant African snail, giant Ghana snail
<i>Agrotis segetum</i>	Turnip moth, cutworm, black cutworm
<i>Belonolaimus longicaudatus</i>	Sting nematode
<i>Diaprepes abbreviatus</i>	Citrus weevil, West Indian weevil, sugarcane rootstalk borer
<i>Ditylenchus destructor</i>	Potato tuber nematode
<i>Elasmopalpus lignosellus</i>	Lesser corn stalk borer
<i>Eusceps postfasciatus</i> (syn. <i>E. batatae</i>)	West Indian sweetpotato weevil
<i>Lissachatina fulica</i> (syn. <i>Achatina fulica</i>)	Giant African snail
<i>Meloidogyne enterolobii</i> (syn. <i>M. mayaguensis</i>)	Root knot nematode
<i>Sweet potato chlorotic stunt virus</i> (<i>Crinivirus</i>)	Sweet potato chlorotic stunt virus
<i>Sweet potato mild mottle virus</i> (<i>Ipomovirus</i>)*	Mild mottle of sweet potato
<i>Sweet potato mild speckling virus</i> (<i>Potyvirus</i>)*	Sweet potato mild speckling virus
<i>Veronicella cubensis</i>	Cuban slug

*with Sweet potato feathery mottle virus (SPFMV) and Sweet potato chlorotic stunt virus (SPCSV)

Figure 73. Distribution of sweetpotato production by state and territory, 2017–18
(based upon LVP)



TABLE GRAPES

Represented by the Australian Table Grape Association
australiangrapes.com.au

In 2017–18 table grape production was valued at \$399 million (LVP), with 177,416 tonnes produced. Exports of 110,280 tonnes predominantly to China, Indonesia, Japan, Hong Kong and the Philippines were valued at \$384 million.

In the 12 months ending June 2019, the table grape industry exported 146,000 tonnes, valued at \$555 million, which was 30 per cent higher than the previous year. Green, red and blue-black varieties of table grapes are produced by approximately 1,000 growers in the major growing regions of Sunraysia and the Murray Valley in Victoria; the Riverland in SA; Swan Valley, Carnarvon and Geraldton regions of WA; the south-east of Queensland; and Ti Tree in the NT.

In the past three years there has been a significant expansion in the table grape sector, with both new landholders investing in existing table grape properties, and non-productive land in the Sunraysia region being redeveloped into table grape vineyards and packing shed facilities. The 2019–20 season is forecast to see approximately 200,000 tonnes produced, with a 35:65 split between the domestic and export markets.

Table 40. High Priority Pests of the table grape industry

Scientific name	Common name
<i>Bactrocera carambolae</i>	Carambola fruit fly
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Candidatus Phytoplasma solani</i>	Bois noir
<i>Daktulosphaira vitifoliae</i> (exotic strains)	Grapevine phylloxera
<i>Drosophila suzukii</i>	Spotted wing drosophila
<i>Grapevine flavescence dorée phytoplasma</i>	Flavescence dorée
<i>Guignardia bidwellii</i>	Black rot
<i>Homalodisca vitripennis</i> (syn. <i>H. coagulata</i>)	Glassy winged sharpshooter
<i>Hyalesthes obsoletus</i>	Cixiidae planthopper
<i>Lobesia botrana</i>	European grapevine moth
<i>Planococcus ficus</i>	Vine mealybug
<i>Polychrosis viteana</i>	American berry moth
<i>Pseudococcus maritimus</i>	Grape mealybug
<i>Xylella fastidiosa</i> (subsp. not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald

Figure 74. Annual value of table grape production, 2007–18

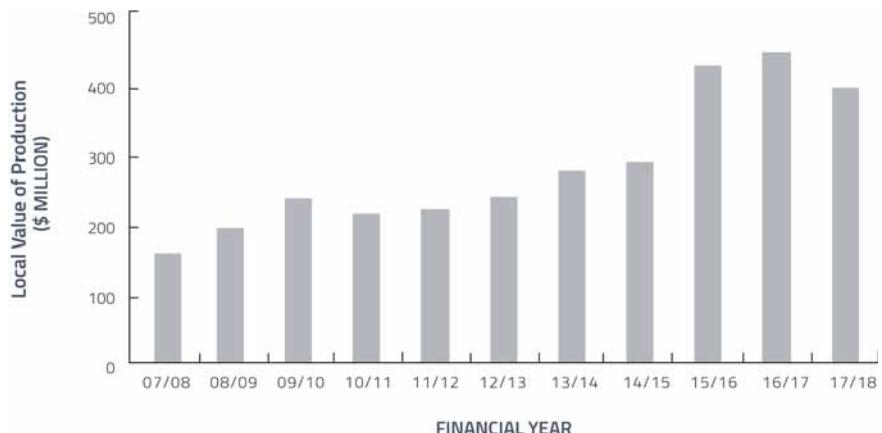
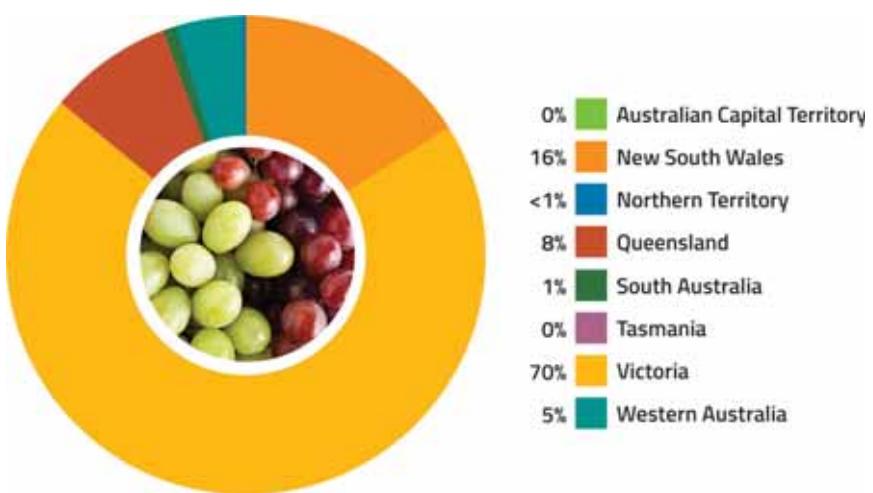


Figure 75. Distribution of table grape production by state and territory, 2017–18 (based upon LVP)



TEA TREE

Represented by the Australian Tea Tree Industry Association (ATTIA)
teatree.org.au

In 2017–18, tea tree production was valued at \$41 million (LVP), with the vast majority exported.

In 2019, there were about 140 tea tree growers in Australia and about 4,600 hectares under plantation production. Industry growth has stabilised, with an average annual production of 1,000 tonnes of oil.

The main product of the Australian tea tree industry is tea tree oil, which is steam distilled from *Melaleuca alternifolia*, an iconic Australian native plant species. Nearly all Australian tea tree oil production is sourced from plantations. Three quarters of plantations are in the coastal region of northern NSW, with 10 per cent located in the Atherton Tablelands of Queensland.

Tea tree oil is exported as bulk oil which is used to make value-added products including healthcare, cosmetic, pharmaceutical, veterinary and aromatherapy products. Most oil (90 per cent) is exported through an established supply chain to over 70 countries, particularly North America and Europe.

Domestic consumption is estimated to be around 95,000 kilograms per annum, with much of this also destined for the export market as value-added cosmetic and therapeutic goods such as soap, shampoo, burn dressings and tea tree oil.

In 2019, the tea tree industry developed a biosecurity plan with PHA and governments.

Table 41. High Priority Pests of the tea tree industry

Scientific name	Common name
<i>Austropuccinia psidii</i> sensu lato (exotic variants) (syn. <i>Puccinia psidii</i>)	Myrtle rust, guava rust, Eucalyptus rust
<i>Calonectria brassicae</i> (syn. <i>C. gracile</i>)	No common name
<i>Calonectria pteridis</i>	Blight, leaf spot, cutting and root rot
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Xylosandrus compactus</i>	Black twig borer

Figure 76. Annual value of tea tree production, 2013–18

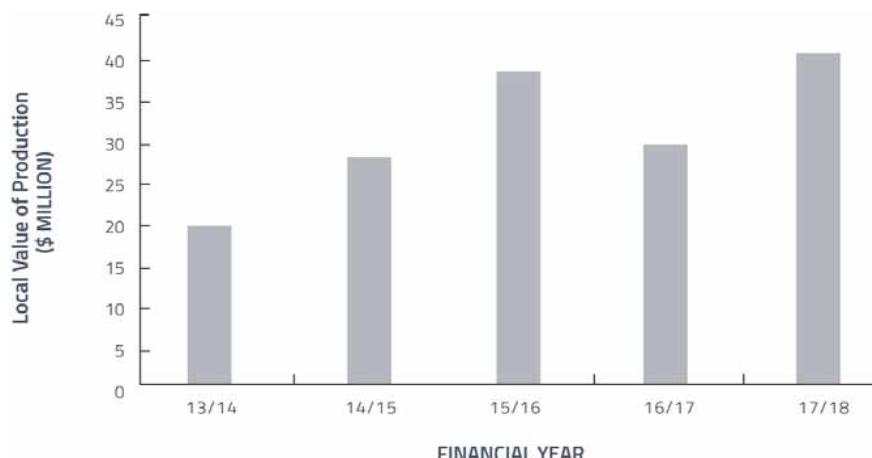
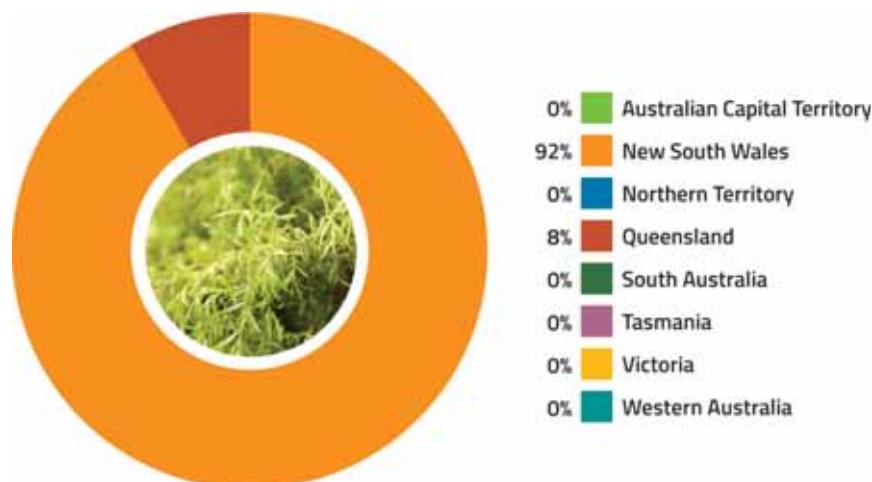


Figure 77. Distribution of tea tree production by state and territory, 2017–18 (based upon LVP)



TRUFFLES

Represented by the Australian Truffle Growers' Association
trufflegrowers.com.au

In 2017–18, Australian truffle production was valued at \$7 million (LVP). Most of the harvest is exported, with markets in more than 40 different countries, primarily in Europe, United States and Asia.

There is estimated to be 450 to 500 truffle orchards, or truffières, around the country, of which around 30 to 40 per cent have harvested truffles. The Australian Truffle Growers' Association has 170 members across the truffle growing states.

Since the first truffle was harvested in 1999, Australia has become the fourth largest producer of the Périgord black truffle (*Tuber melanosporum*) in the world. The major production area for Australian truffles is the Manjimup region of WA, which accounts for around 75 per cent of the harvest. There is increasing production in Tasmania, ACT, NSW and Victoria. A small number of newer farms in SA and southern Queensland will produce in the next few years.

Australian *T. melanosporum* are recognised for their excellent quality and are highly sought after in overseas markets, particularly in the northern hemisphere, where Australian produce is available when local product is out of season. The two other species of truffle with limited commercial production in Australia are *T. aestivum* and *T. borchii*.

Table 42. High Priority Pests of the truffle industry

Scientific name	Common name
<i>Anisogramma anomala</i>	Eastern filbert blight, hazelnut blight
<i>Halyomorpha halys</i>	Brown marmorated stink bug
<i>Lymantria monacha</i>	Nun moth
<i>Phytophthora ramorum</i>	Sudden oak death
<i>Pseudomonas avellanae</i> (syn. <i>P. syringae</i> pv. <i>avellanae</i>)	Bacterial canker
<i>Pucciniastrum coryli</i>	Hazelnut rust

Figure 78. Annual value of truffle production, 2012–18

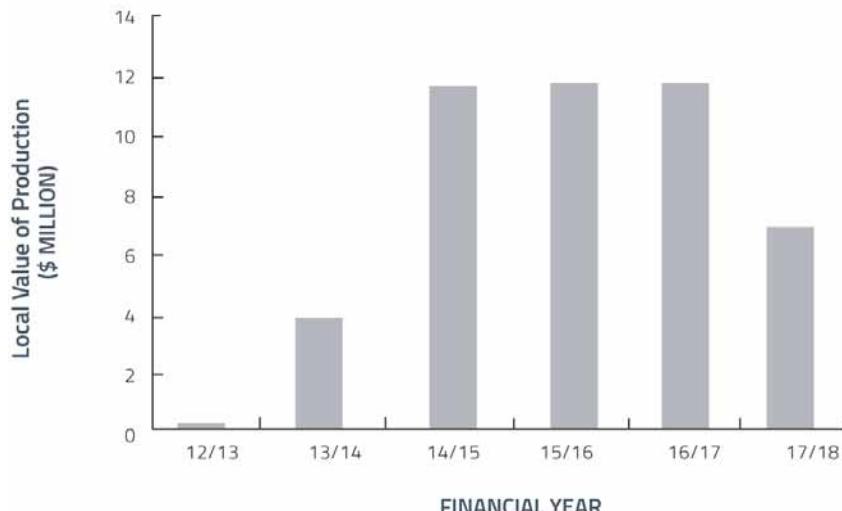
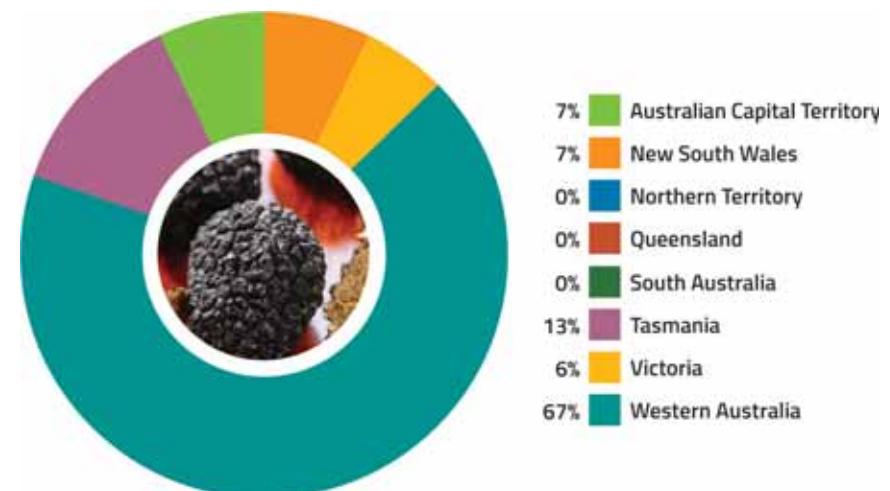


Figure 79. Distribution of truffle production by state and territory, 2017–18 (based on LVP)



VEGETABLES (INCLUDING POTATOES)

Represented by AUSVEG

ausveg.com.au

In 2017–18, vegetable and potato production was valued at \$2.3 billion (LVP). Major crops include potatoes, carrots and lettuce. Potato production alone was valued at \$558 million (LVP). Exports of vegetables, including potatoes, were valued at \$255 million.

Australia's diverse climate and soils accommodate vegetable cultivation in all states and territories, ensuring a constant supply of fresh vegetables. Australian vegetable growers provide the majority of fresh vegetables consumed in Australia and an increasing amount of fresh vegetables consumed overseas.

The Australian vegetable industry is committed to building its capacity to respond to potential biosecurity threats. A vegetable industry biosecurity advisor, two full-time farm biosecurity officers, and a potato pest surveillance project officer allow the industry to participate in a range of biosecurity initiatives.

During 2019, the farm biosecurity officers visited numerous growing regions across Australia including Greater Sydney in NSW; Darwin in the NT; Bowen, Ayr, Mareeba and Atherton in Queensland; Mornington Peninsula and Cranbourne in Victoria; Adelaide Plains and Riverland in SA; Devonport in Tasmania; and Perth and Albany in WA. They held a series of regional biosecurity awareness seminars and visited more than 80 individual farms.

The farm biosecurity officers were also involved in biosecurity initiatives including participation in technical meetings with the Australian Government Department of Agriculture as well as engagement with state government departments, relevant committees, other industry bodies and PHA. They also facilitated a Melbourne-based pilot program that focused on exotic plant pest awareness in urban environments. The program enabled the farm biosecurity officers to engage with community gardeners and others involved in urban farming, in order to raise awareness of exotic plant pests and reporting protocols.

In 2019 the development of a national potato biosecurity surveillance strategy for the Australian potato industry commenced. This involved significant engagement with potato growers, processors, seed suppliers and certifiers, industry bodies, the Australian Government and governments in WA, NSW, SA, Tasmania, Victoria and Queensland.

Graphs of the annual value of production for vegetables and potatoes are presented separately, as are the lists of High Priority Pests.

Figure 80. Annual value of vegetable production (excluding potatoes), 2007–18

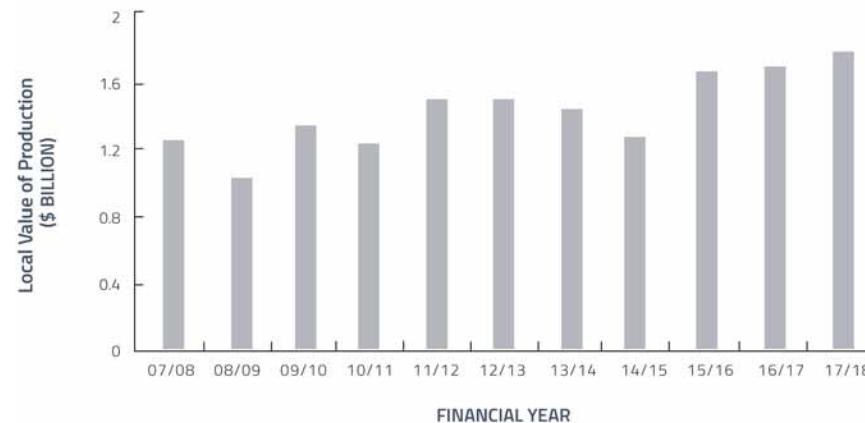


Figure 81. Distribution of vegetable production (excluding potatoes) by state and territory, 2017–18 (based upon LVP)

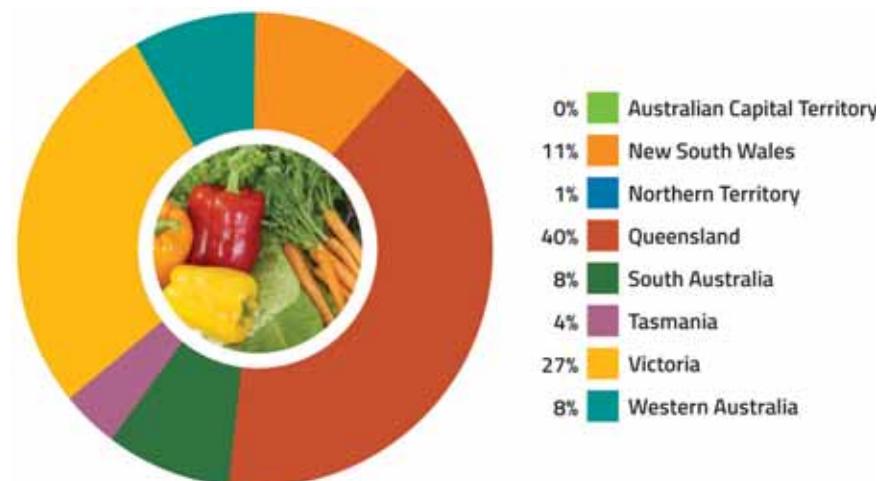


Table 43. High Priority Pests of the vegetable industry (excluding potatoes)

Scientific name	Common name	Scientific name	Common name
<i>Achatina achatina</i>	Giant African snail, giant Ghana snail	<i>Lygus hesperus</i>	Western plant bug
<i>Alternaria humicola</i>	Leaf spot	<i>Meloidogyne enterolobii</i> (syn. <i>Meloidogyne mayaguensis</i>)	Root knot nematode
<i>Aphis fabae</i>	Black bean aphid	<i>Meloidogyne naasi</i>	Barley root knot nematode
<i>Aulacophora foveicollis</i>	Red pumpkin beetle	<i>Phytomyza gymnostoma</i>	Allium leaf miner
<i>Bactrocera carambolae</i>	Carambola fruit fly	<i>Phytophthora infestans</i> (A2 mating type and exotic strains of A1 mating type)	Late blight
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayae</i> , <i>B. philippinensis</i>)	Oriental fruit fly	Potato spindle tuber viroid (Pospiviroidae) (exotic strains)	Potato spindle tuber viroid
<i>Bactrocera passiflorae</i>	Fijian fruit fly	<i>Psila rosae</i>	Carrot rust fly
<i>Bactrocera trivialis</i>	New Guinea fruit fly	<i>Puccinia agrophila</i>	No common name
<i>Bemisia tabaci</i> (types Asia 1, China 1, China 2, Asia II (1-8), Italy, Sub-Saharan Africa (1-4), Uganda, New World, Mediterranean, Middle East-Asia Minor 2, Indian Ocean)	Silverleaf whitefly	<i>Puccinia apii</i>	Rust of celery
<i>Candidatus Liberibacter solanacearum</i> (syn. <i>Candidatus Liberibacter psyllaurous</i>)	Zebra chip	<i>Puccinia nitida</i>	Rust of dill
<i>Colletotrichum higginsianum</i>	Anthracnose	<i>Puccinia opizii</i>	Rust
<i>Colletotrichum lenti</i> (lentil affecting strain)	Lentil anthracnose, soybean anthracnose	<i>Puccinia</i> spp. (exotic species)	Rusts
<i>Delia antiqua</i>	Onion fly	<i>Rhizoctonia solani</i> f. sp. <i>sasakii</i> (AG1) (teleomorph: <i>Corticium sasakii</i> (syn. <i>Thanatephorus cucumeris</i>))	Banded leaf and sheath spot
<i>Delia floralis</i>	Summer cabbage fly	<i>Rhizoglyphous setosus</i>	Bulb mite
<i>Delia florilega</i>	Bean fly	<i>Spodoptera frugiperda</i>	Fall armyworm
<i>Eumerus strigatus</i>	Lesser bulb fly	<i>Thaumatotibia leucotreta</i> (syn. <i>Cryptophlebia leucotreta</i>)	False codling moth
<i>Groundnut bud necrosis virus</i> (Tospovirus)	Bud necrosis disease	<i>Tomato brown rugose fruit virus</i> (Tobamovirus)	Tomato brown rugose fruit virus (ToBRFV)
<i>Halyomorpha halys</i>	Brown marmorated stink bug	<i>Tomato mottle mosaic virus</i> (Tobamovirus)	Tomato mottle mosaic virus (ToMMV)
<i>Harpophora maydis</i>	Late wilt	<i>Trichoplusia ni</i>	Cabbage looper
<i>Heterodera carotae</i>	Carrot cyst nematode	<i>Tuta absoluta</i>	South American tomato moth, tomato leaf miner
<i>Heterodera ciceri</i>	Chickpea cyst nematode	<i>Uromyces lineolatus</i>	Rust
<i>Liriomyza bryoniae</i>	Tomato leaf miner	<i>Watermelon bud necrosis virus</i> (Tospovirus)	Watermelon bud necrosis
<i>Liriomyza huidobrensis</i>	Serpentine leaf miner	<i>Zeugodacus curcurbitae</i> (syn. <i>Bactrocera cucurbitae</i>)	Melon fruit fly
<i>Liriomyza sativae</i>	Vegetable leaf miner, American leaf miner		
<i>Liriomyza trifolii</i>	American serpentine leaf miner		
<i>Lissachatina fulica</i> (syn. <i>Achatina fulica</i>)	Giant African land snail		

Figure 82. Annual value of potato production, 2007–18

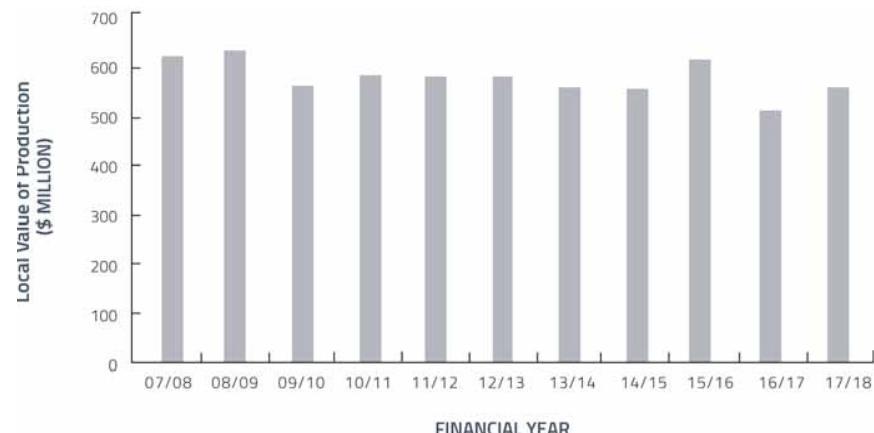


Figure 83. Distribution of potato production by state and territory, 2017–18 (based on LVP)

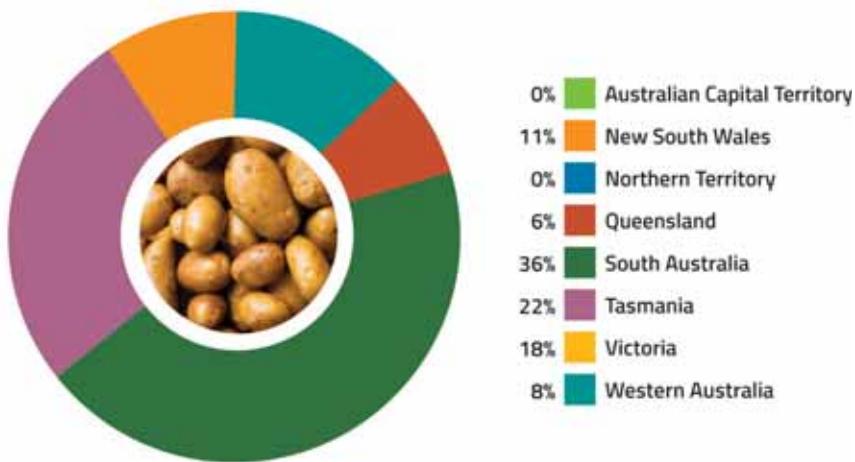


Table 44. High Priority Pests of the potato industry

Scientific name	Common name
<i>Aphis fabae</i>	Black bean aphid
<i>Aphis gossypii</i> (exotic strains)	Cotton aphid
<i>Candidatus Liberibacter solanacearum</i> (syn. <i>Candidatus Liberibacter psyllaorous</i>)	Zebra chip
<i>Globodera pallida</i>	Pale potato cyst nematode
<i>Globodera rostochiensis</i> (pathotypes RO2, RO3, RO4 and RO5)	Golden potato cyst nematode
<i>Leptinotarsa decemlineata</i>	Colorado potato beetle
<i>Liriomyza huidobrensis</i>	Serpentine leaf miner
<i>Liriomyza sativae</i>	Vegetable leaf miner, American leaf miner
<i>Liriomyza trifolii</i>	American serpentine leaf miner
<i>Meloidogyne enterolobii</i> (syn. <i>M. mayaguensis</i>)	Root knot nematode
<i>Phytophthora infestans</i> (A2 mating type and exotic strains of A1 mating type)	Late blight
Potato spindle tuber viroid (Pospiviroidae) (exotic strains)	Potato spindle tuber viroid
<i>Ralstonia syzygii</i> (syn. <i>R. solanacearum</i> race 4, <i>Pseudomonas solanacearum</i>)	Bacterial wilt

WALNUTS

Represented by the Australian Walnut Industry Association

walnut.net.au

In 2017–18, the walnut industry was valued at \$55 million (LVP), with exports valued at \$22.7 million. In-shell production of 11,800 tonnes was produced from 3,890 hectares.

About 60 per cent of Australia's walnut production is exported with greatest demand for in-shell walnuts in China, Turkey and Italy. The Australian walnut industry operates in most states of Australia. Major walnut production areas are on the east coast of Tasmania; the Goulburn Valley near Shepparton; the Murray Irrigation area near Kerang and Swan Hill in Victoria; the Riverina near Griffith in NSW; and Manjimup in WA. The industry is predicted to grow to 14,000 tonnes (4,300 hectares) by 2021 as current growers expand their orchards and new growers enter the industry.

Australia is free from the major pests and diseases that affect walnuts overseas, and the Australian Walnut Industry Association prioritises biosecurity to maintain this status.

Biosecurity is included in the Australian Walnut Industry Five Year Strategic Plan – 2015 to 2020 and it is part of the industry development officer's role. The industry website maintains a biosecurity section to raise awareness of biosecurity among growers, and a representative attends PHA meetings and Australian Government Biosecurity Roundtables.

In 2019, the Australia Walnut Industry Association participated in responses to pest incursions. The association has funded projects to establish an Emergency Plant Pest Response (EPPR) levy and an Owner Reimbursement Cost Framework for the walnut industry. Consultation was undertaken on the EPPR levy and the request to implement the levy, set at zero, is currently with the Minister for Agriculture.

Table 45. High Priority Pests of the walnut industry

Scientific name	Common name
<i>Amyelois transitella</i>	Navel orange worm
<i>Halyomorpha halys</i>	Brown marmorated stink bug
<i>Lymantria dispar</i>	Gypsy moth (Asian and European strains)
<i>Trogoderma granarium</i>	Khapra beetle
<i>Verticillium dahliae</i> (exotic defoliating strains)	Verticillium wilt

Figure 84. Annual value of walnut production, 2007–18

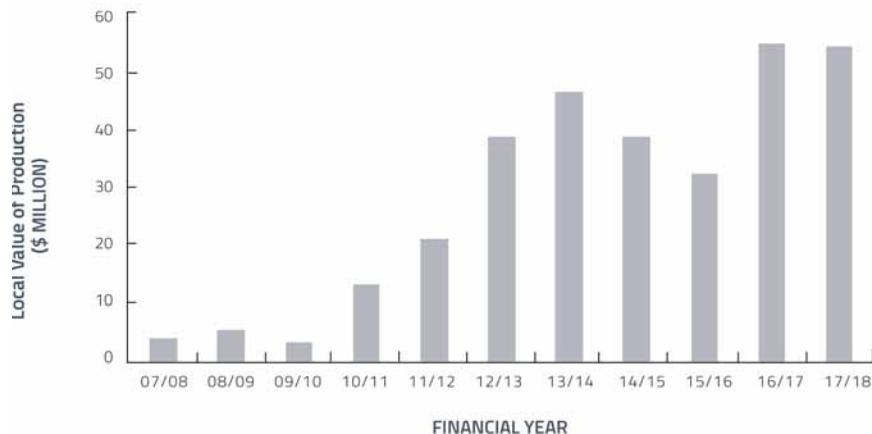
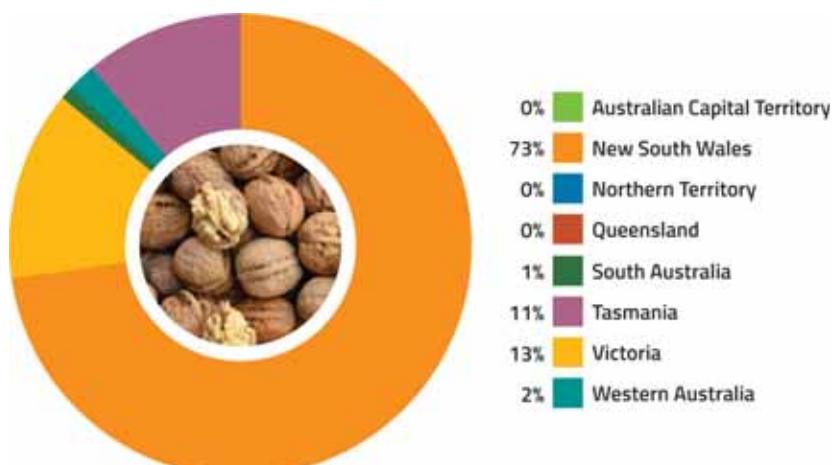


Figure 85. Distribution of walnut production by state and territory, 2017–18 (based on LVP)



WINE GRAPES

Represented by Australian Grape and Wine

agw.org.au

In 2017–18, the Australian wine industry was valued at \$943 million (LVP) and the value of wine exports grew 20 per cent to \$2.76 billion as a result of 10 percent increase in volume exported and a nine per cent increase in price per litre.

The wine industry has a significant footprint in Australia, with more than 6,000 wine grape growers, a vineyard area of 146,128 hectares, and 2,400 Australian wine producers blending grapes into wine. The most grown wine grape varieties are Shiraz (30%), Cabernet Sauvignon (18%) and Chardonnay (16%). The major varieties by colour are Shiraz, Cabernet Sauvignon and Merlot for reds and Chardonnay, Sauvignon Blanc and Semillon for whites.

The Australian wine industry has been fortunate to date in avoiding many of the world's most devastating grape vine pests and as a result possesses some of the oldest vineyards in the world. Australia remains free from *Xylella fastidiosa*, and the industry continues to work hard to manage the spread of phylloxera. Australian grape and wine producers enjoy an enviable global reputation for producing high quality wines.

Australian Grape & Wine promotes biosecurity within the wine sector and the viticulture industry more broadly, and since its inception in February 2019 has convened a Wine Biosecurity Committee as a mechanism for coordinating and prioritising biosecurity work across the wine sector and promoting leadership.

Australian Grape & Wine includes regular biosecurity updates via their member newsletter, as well as working with Vinehealth Australia to develop biosecurity alerts in the event of serious endemic pest events or exotic pest incursions impacting the sector. Recognising the potential impacts on horticulture crops in Australia, in 2019 Hort Innovation and Wine Australia jointly funded the national *Xylella* preparedness initiative (see page 44).

Figure 86. Annual value of wine grape production, 2007–18

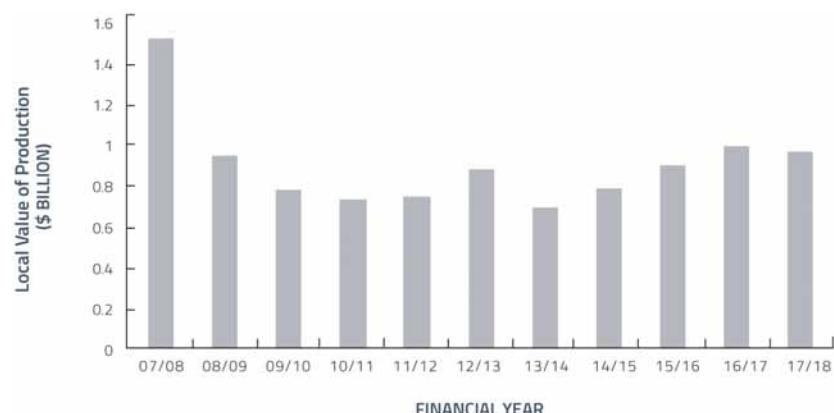


Table 46. High Priority Pests of the wine grape industry

Scientific name	Common name
<i>Bactrocera carambolae</i>	Carambola fruit fly
<i>Bactrocera dorsalis</i> (syn. <i>B. invadens</i> , <i>B. papayaee</i> , <i>B. philippinensis</i>)	Oriental fruit fly
<i>Candidatus Phytoplasma solani</i>	Bois noir
<i>Daktulosphaira vitifoliae</i> (exotic strains)	Grapevine phylloxera
<i>Drosophila suzukii</i>	Spotted wing drosophila
Grapevine flavescentia dorée phytoplasma	Flavescentia dorée
<i>Guignardia bidwellii</i>	Black rot
<i>Homalodisca vitripennis</i> (syn. <i>H. coagulata</i>)	Glassy winged sharpshooter
<i>Hyalesthes obsoletus</i>	Cixiidae planthopper
<i>Lobesia botrana</i>	European grapevine moth
<i>Planococcus ficus</i>	Vine mealybug
<i>Polychrosis viteana</i>	American berry moth
<i>Pseudococcus maritimus</i>	Grape mealybug
<i>Xylella fastidiosa</i> (subsp. not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald

Figure 87. Distribution of wine grape production by state and territory, 2017–18 (based on LVP)

