Chapter 3

Plant industry profiles

Plant industry profiles

The following pages provide information on the economic value and the major growing regions for plant industries that are members of Plant Health Australia (PHA).

Graphs show trends over recent years in local value of production (LVP), which is the value of agricultural commodities at the farm gate. 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 2018–19.[28]

Each profile also provides details of the industry's key exotic pest threats and the biosecurity initiatives that they have undertaken in 2020. All of these industries are signatories to the Emergency Plant Pest Response Deed, apart from the Australian Blueberry Growers' Association.

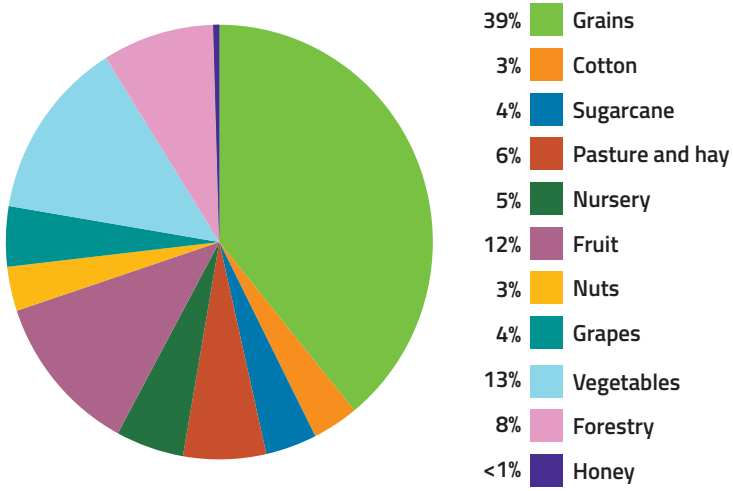
Figure 7 shows the contribution of each of the main plant production industries (including honey and beeswax) to total plant gross value of production in 2018–19, the latest year for which this breakdown is available.[29,30]

28 Hort Innovation (2021). Australian Horticulture Statistics Handbook 2019–20, Accessed online 28 March 2021. horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/grower-resources/ha18002-assets/australian-horticulture-statistics-handbook/

29 Australian Bureau of Agricultural and Resource Economics and Sciences. Agricultural commodities: March quarter 2021. Accessed 20 March 2021. agriculture.gov.au/abares/research-topics/agricultural-outlook/data#agricultural-commodities

30 Australian Bureau of Statistics 7503.0 - Value of Agricultural Commodities Produced, Australia, 2018-19. Accessed online 20 March 2021. abs.gov.au/statistics/industry/agriculture/value-agricultural-commodities-produced-australia/latest-release#data-download

Figure 7. Comparative value of Australia's plant production industries, based on gross value of production, 2017-20



Source: ABS 7503 series and ABARES

ALMONDS

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

In 2018–19, almond production was valued at $720 million (LVP), with exports valued at $675 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 one of the major destinations for Australian almonds.

The industry has been expanding rapidly since 2016 with additional hectares bringing the total industry orchard area to just over 53,000 hectares. .

The 2020 production was 111,100 tonnes, however as recent plantings reach full maturity the industry's productive capacity will be approximately 170,000 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 230,000 hives required during the pollination season. The almond blossoms provide one of the first natural sources of food for bees each spring.

Table 9. High Priority Pests of the almond industry

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

Figure 8. Annual value of almond production, 2007–19

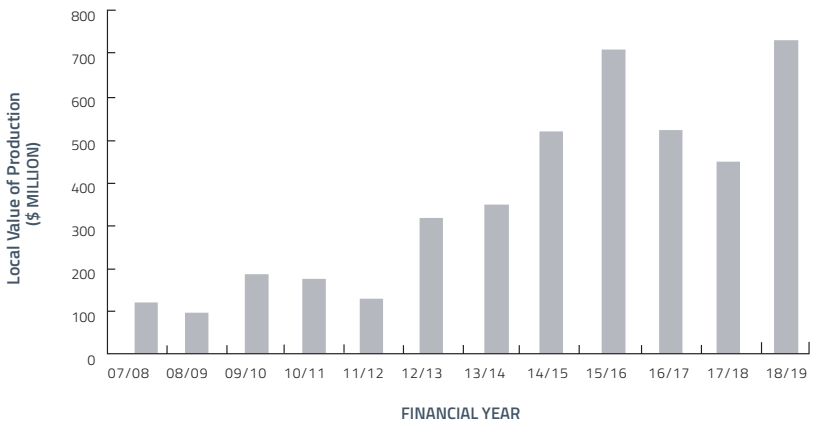
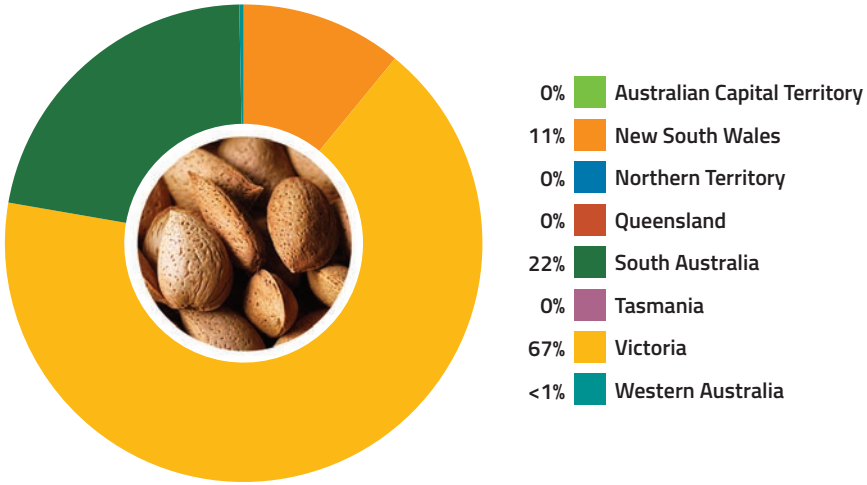


Figure 9. Distribution of almond production by state and territory, 2018–19 (based on LVP)



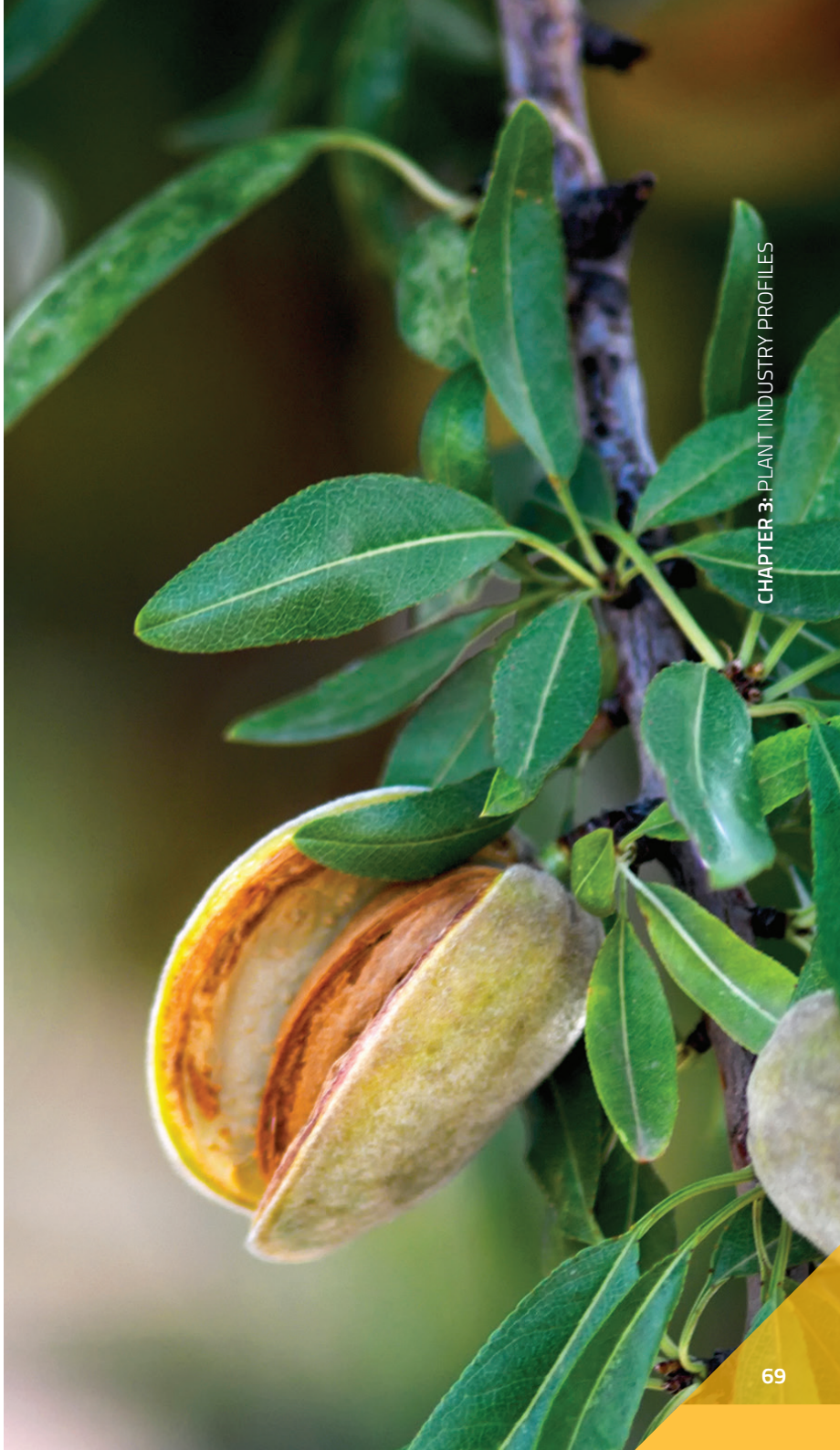


Image courtesy of Apple and Pear Australia Limited

APPLES AND PEARS

Represented by Apple and Pear Australia
apal.org.au

In 2018–19, apple and pear production was valued at $503 million (LVP) with fresh exports valued at $27 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. VIC 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 apple and pear industries produced 420,337 tonnes of fruit for the year ending 30 June 2020.

The major production areas include the Goulburn Valley, Gippsland, Yarra Valley and the Mornington Peninsula in VIC; Stanthorpe in QLD; Batlow and Orange in NSW; the Huon Valley and Tamar Valley in TAS; 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.

Image courtesy of Apple and Pear Australia Limited

Table 10. High Priority Pests of the apple and pear industry

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

Figure 10. Annual value of apple and pear production, 2007–19

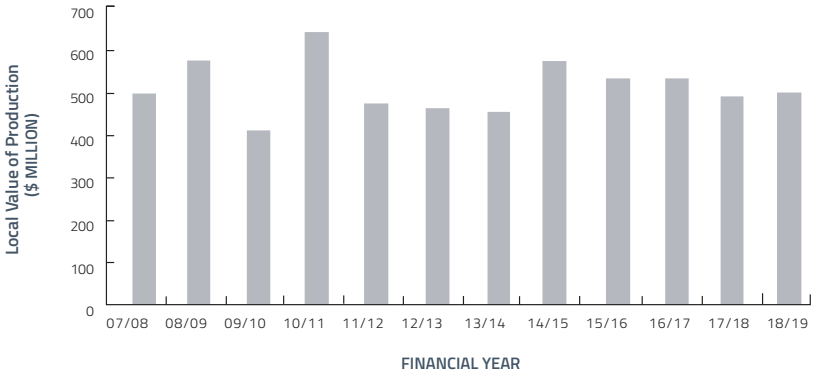
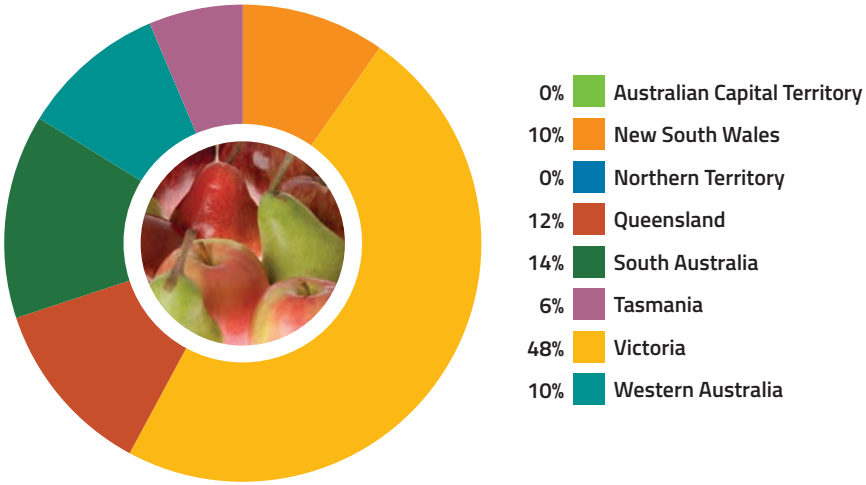


Figure 11. Distribution of apple and pear production by state and territory, 2018–19 (based on LVP)



AVOCADOS

Represented by Avocados Australia
avocado.org.au

In 2018–19, avocado production was valued at $296 million (LVP), with exports valued at $19.7 million, which were mainly shipped to Malaysia, Singapore, and Hong Kong.

Australians' love of avocados has grown steadily each year since the 1990s. Consumption in 2018–19 reached 3.8 kilograms per person, and 3.88 kilograms person in 2019–20, up from 1.2 kilograms in 1997–98.

QLD continues to dominate Australia's avocado production followed by WA, NSW, SA and VIC, with a small amount of production in TAS and one known orchard in the NT. Orchard areas are expanding in almost every growing region. This geographic diversity in growing regions ensures consumers have access to Australian avocados year-round. Fruit imported from New Zealand and, as of late 2020, Chile, 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.

Avocados Australia is active in the Consultative Committee on Emergency Plant Pests (CCEPP) and the National Management Groups (NMG) responding to the annual incursion of three fruit fly species in the Torres Strait, and to the detections of *Varroa jacobsoni* in QLD, also under active eradication (see page 191–2).

Avocados Australia has also recently participated in updating the industry's biosecurity plan (version 3.0 was released in February 2020), and signed a Memorandum of Understanding with PHA in June 2020 to improve the industry's capability to prepare for and respond to biosecurity risks, at the industry level.

Table 11. High Priority Pests of the avocado industry

Scientific name	Common name
Bactrocera carambolae	Carambola fruit fly
Bactrocera dorsalis (syn. *B. invadens, B. papayae, B. philippinensis*)	Oriental fruit fly
Bactrocera facialis	Tropical fruit fly, Tongan fruit fly
Bactrocera kandiensis	Fruit fly
Bactrocera kirki	Fijian fruit fly
Bactrocera melanotus	Fruit fly
Bactrocera passiflorae	Fijian fruit fly
Bactrocera xanthodes	Pacific fruit fly
Conotrachelus aguacatae	Small avocado seed weevil
Conotrachelus perseae	Small seed weevil
Ctenopseustis herana	Brown headed leafroller
Ctenopseustis obliquana	Brown headed leafroller
Elsinoë perseae (syn. *Sphaceloma perseae*)	Avocado scab
Heilipus lauri	Large seed weevil, avocado seed weevil
Oligonychus perseae	Persea mite
Paracoccus marginatus	Papaya mealybug
Phytophthora mengei	Bark canker
Phytophthora ramorum	Sudden oak death
Pseudomonas syringae pv. *syringae, Pantoea agglomerans, Xanthomonas campestris*	Bacterial canker complex, avocado blast complex
Raffaelea lauricola	Laurel wilt
Scirtothrips perseae	Avocado thrips
Stenoma catenifer	Seenomid (avocado) moth, avocado fruit borer, avocado seed moth
Zeugodacus curcubitae (syn. *Bactrocera cucurbitae*)	Melon fruit fly

Figure 12. Annual value of avocado production, 2007–19

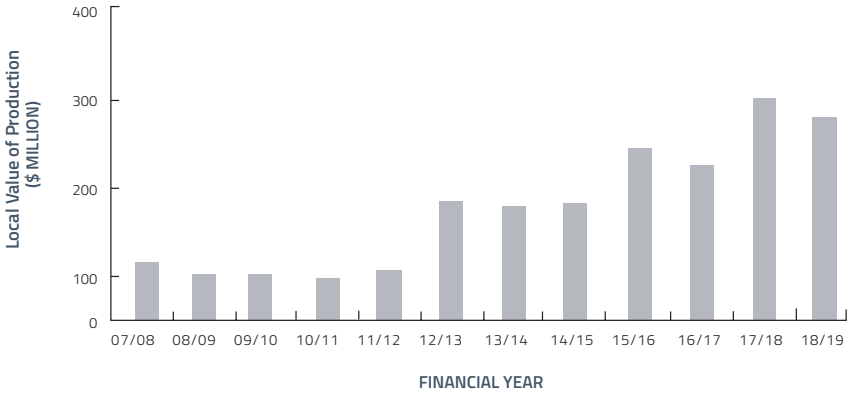
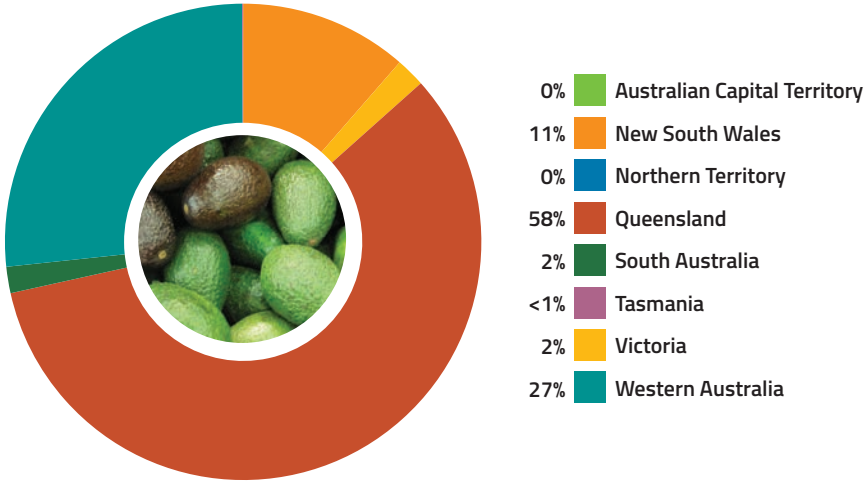


Figure 13. Distribution of avocado production by state and territory, 2018–19 (based on LVP)



BANANAS

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

In 2018–19, banana production was valued at $437 million (LVP). Most 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 QLD, NSW, WA and the NT. There are currently about 13,000 hectares of bananas grown in Australia; 94 per cent of which are located in four north QLD 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 2020 there continues to be two major biosecurity threats challenging the banana industry:

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

Panama TR4

Panama TR4 was first detected on a north QLD 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 2020 the disease was contained to five farms in the Tully Valley. While the plants on the original infected property were destroyed and all farming operations ceased, all other quarantined farms continue to produce and pack fruit under strict biosecurity conditions. Biosecurity Queensland conduct surveillance on all commercial banana farms in north QLD with the frequency of surveillance linked to the level of risk of Panama TR4 being detected. The ABGC and QDAF are working collaboratively to transition the leadership of the Panama TR4 Program from government to industry. It is expected that the transition will conclude by June 2023.

As a result of the second detection, Biosecurity Queensland, industry, local government stakeholders and the Queensland Department of Environment and Science came together to develop of a feral pig management plan that complements the activities of the Panama TR4 Program. Feral pigs in Tully have been identified as a major risk vector in the spread of the disease.

ABGC engaged a highly skilled vertebrate pest management contractor who coordinates, supports and mentors banana farmers to improve pest management practices on their land. This includes increasing skills and building long-term capacity in pest animal management, and raising awareness of responsibilities and obligations under legislation.

Banana bunchy top virus

A control program for banana bunchy top virus has been operating in NSW and south-east QLD 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 supress the incidence of bunchy top disease on commercial farms. The project is working with growers to increase their capacity to manage bunchy top disease on their farms.

Yellow Sigatoka and biosecurity awareness, coordination and strategy

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 QLD 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 12. High Priority Pests of the banana industry

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

Figure 14. Annual value of banana production, 2007–19

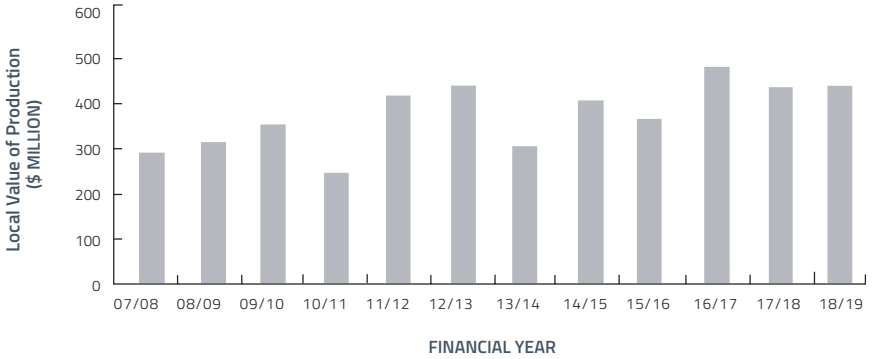
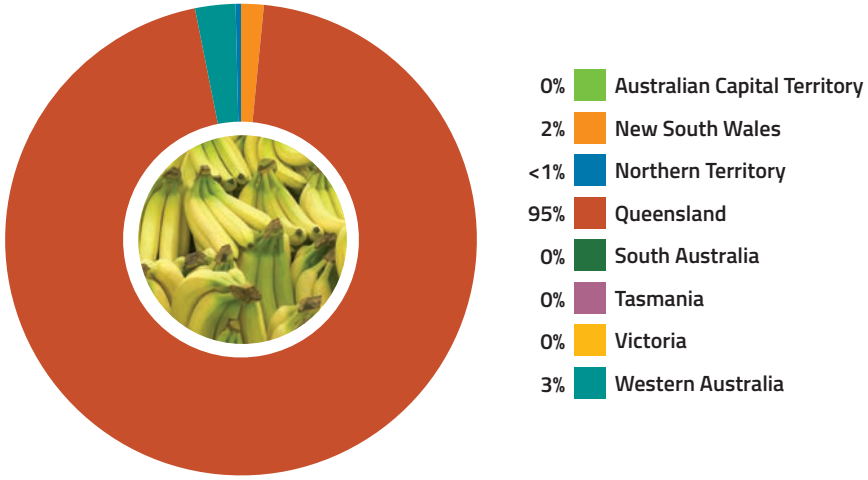


Figure 15. Distribution of banana production by state and territory, 2018–19 (based on LVP)



BLUEBERRIES

Represented by the Australian Blueberry Growers' Association
berries.net.au/home/about/blueberries/abga

In 2018–19, blueberry production was valued at approximately $271 million (LVP), with fresh exports valued at $4.8 million.

The industry is expanding, with an average 19,008 tonnes of blueberries being produced per annum. Most 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 85 per cent of the Australian crop in 2019. 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 QLD; the Tamar Valley, Meander Valley, Bernie, Devonport and the Huon Valley in TAS; the Grampians, Silvan and Strathbogie in VIC; 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 VIC, TAS and the southern highlands of NSW, whereas southern highbush and rabbiteye varieties are grown in NSW and QLD.

Table 13. High Priority Pests of the blueberry industry

Scientific name	Common name
Croesia curvalana	Blueberry leaftier
Drosophila suzukii	Spotted wing drosophila
Ericaphis fimbriata (with blueberry scorch carlavirus)	Blueberry aphid
Homalodisca vitripennis (with *Xylella fastidiosa*)	Glassy winged sharpshooter
Monilinia fructigena	Brown rot
Monilinia vaccinii-corymbosi	Mummy berry, cotton ball disease
Phytophthora ramorum	Sudden oak death
Xylella fastidiosa (subspecies 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, 2011–19

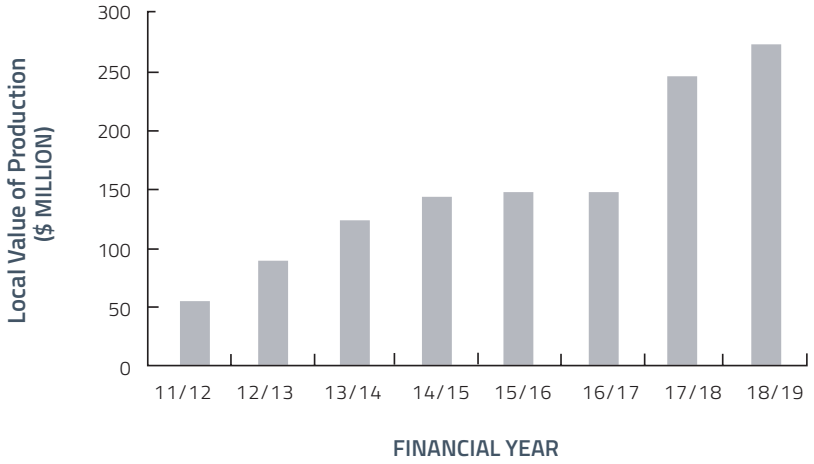
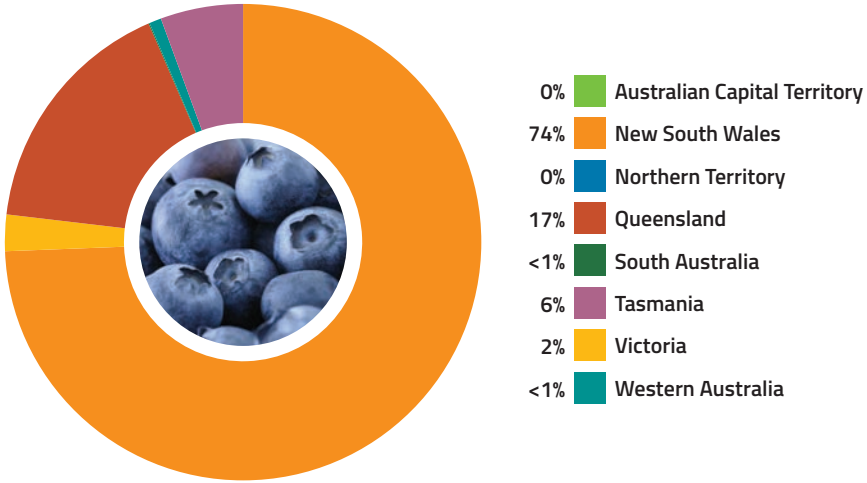


Figure 17. Distribution of blueberry production by state and territory, 2018–19 (based on LVP)



CANNED FRUITS

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

In 2018–19 production of canned fruit was valued at $14.7 million (LVP) with exports valued at $9.2 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 30,000 to 35,000 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 VIC, processing Australian apples, apricots, peaches, pears and plums at Shepparton.

Biosecurity plans and manuals have been developed with PHA and state governments for the pome fruit (apple and pear) and stone fruit (summerfruit) industries: however, the canned fruit industry does not have a specific biosecurity plan or manual.

Figure 18. Annual value of canned fruit production, 2007–19

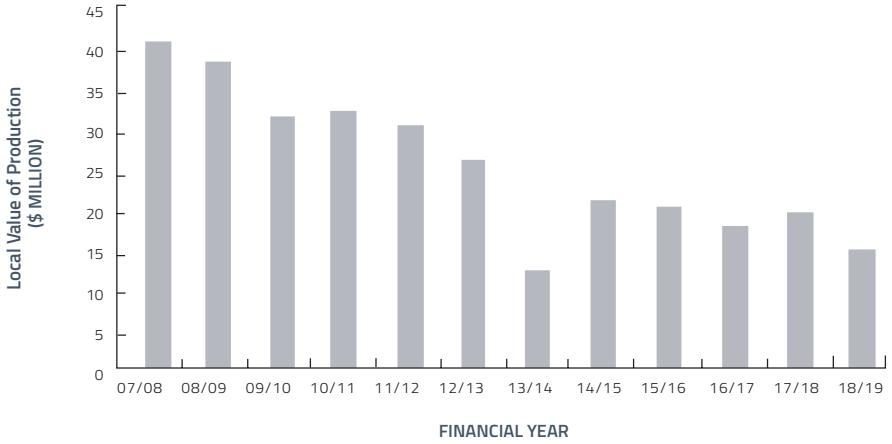
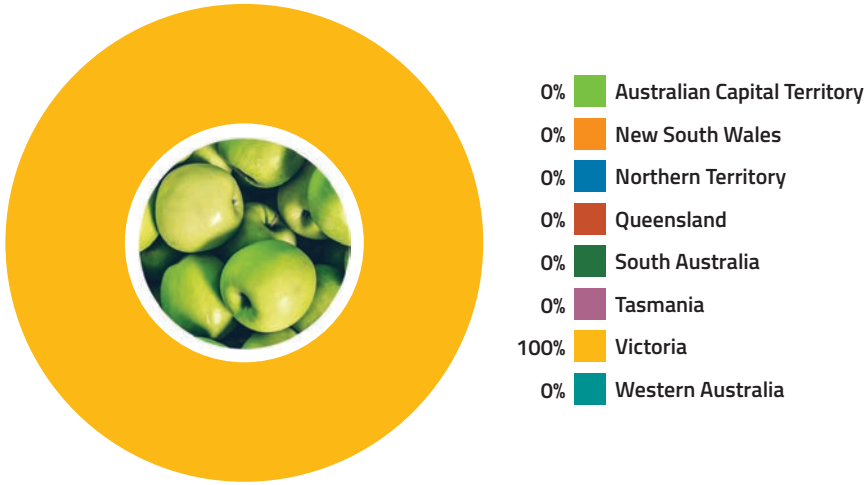


Figure 19. Distribution of canned fruit production by state and territory, 2018–19 (based on LVP)



CHERRIES

Represented by Cherry Growers Australia
cherrygrowers.org.au

In 2018–19, cherry production was valued at $157 million (LVP), with exports valued at $79.5 million.

Cherries are produced in six states, with NSW, VIC and TAS being the three largest producers, followed by SA. These four states have a strong export focus. WA and QLD are relatively small producers, focusing primarily 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.

Cherry production is increasing and moving into new areas largely due to increased export opportunities. Recent access to key Free Trade Agreement markets such as China, Korea and Vietnam have given mainland growers an unprecedented opportunity which until now has been the exclusive domain of TAS with its fruit fly free status.

Total production is approximately 20,000 tonnes annually of which 25 per cent was exported to 37 countries.

Figure 20. Annual value of cherry production, 2007–19

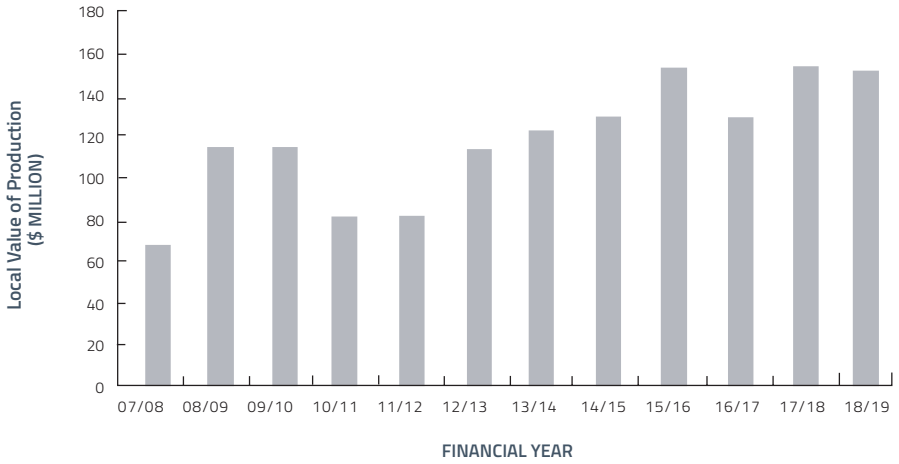
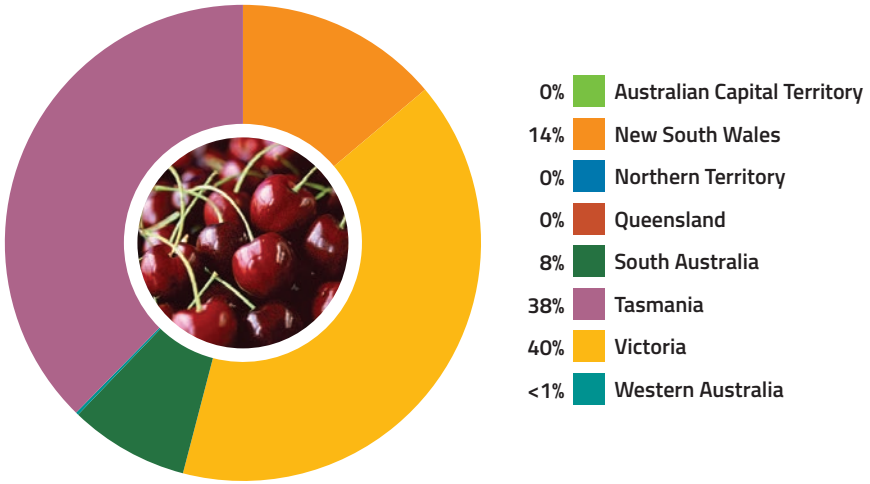


Table 14. High Priority Pests of the cherry industry

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

Figure 21. Distribution of cherry production by state and territory, 2018–19 (based upon LVP)



CHESTNUTS

Represented by Chestnuts Australia
chestnutsaustralia.com.au

In 2018–19 chestnut production was valued at $7.8 million (LVP), with exports valued at less than $0.1 million.

Around 1,480 hectares are planted with 275,000 chestnut trees. In 2020, approximately 1,250 tonnes of chestnuts were produced. It is estimated that with more trees being planted in NSW, production will increase to approximately 1,500 tonnes with a value of $12 million by 2022. 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 VIC and NSW.

Throughout 2020, Chestnuts Australia participated in the Transition to Management program for chestnut blight, which began in December 2019. This included sitting on the chestnut blight decision-making committees, the CCEPP and the NMG and working specifically with Agriculture Victoria.

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 Strategic Blueprint 2030 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 15. High Priority Pests of the chestnut industry

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

Figure 22. Annual value of chestnut production, 2009–19

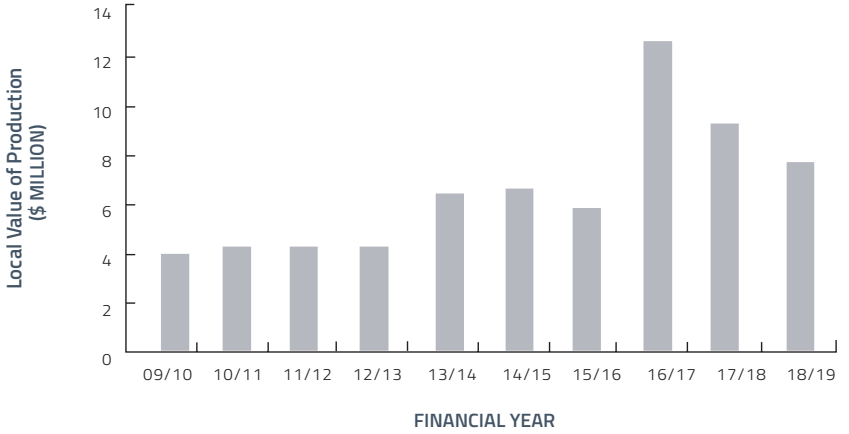
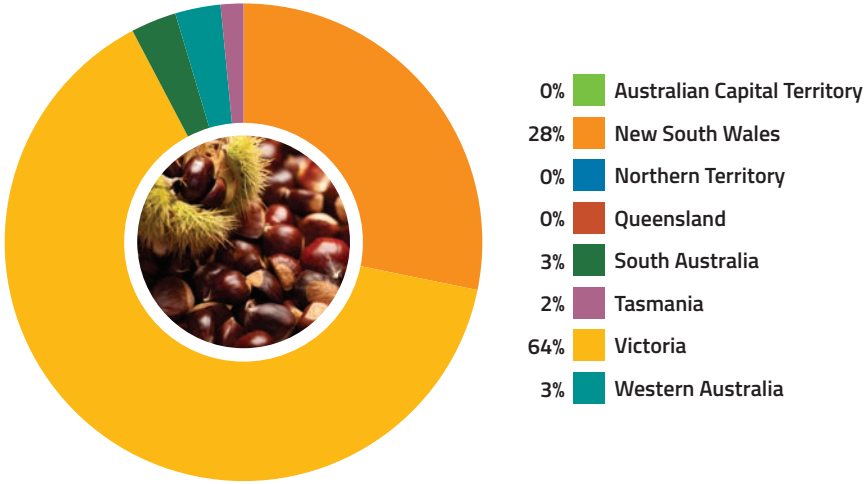
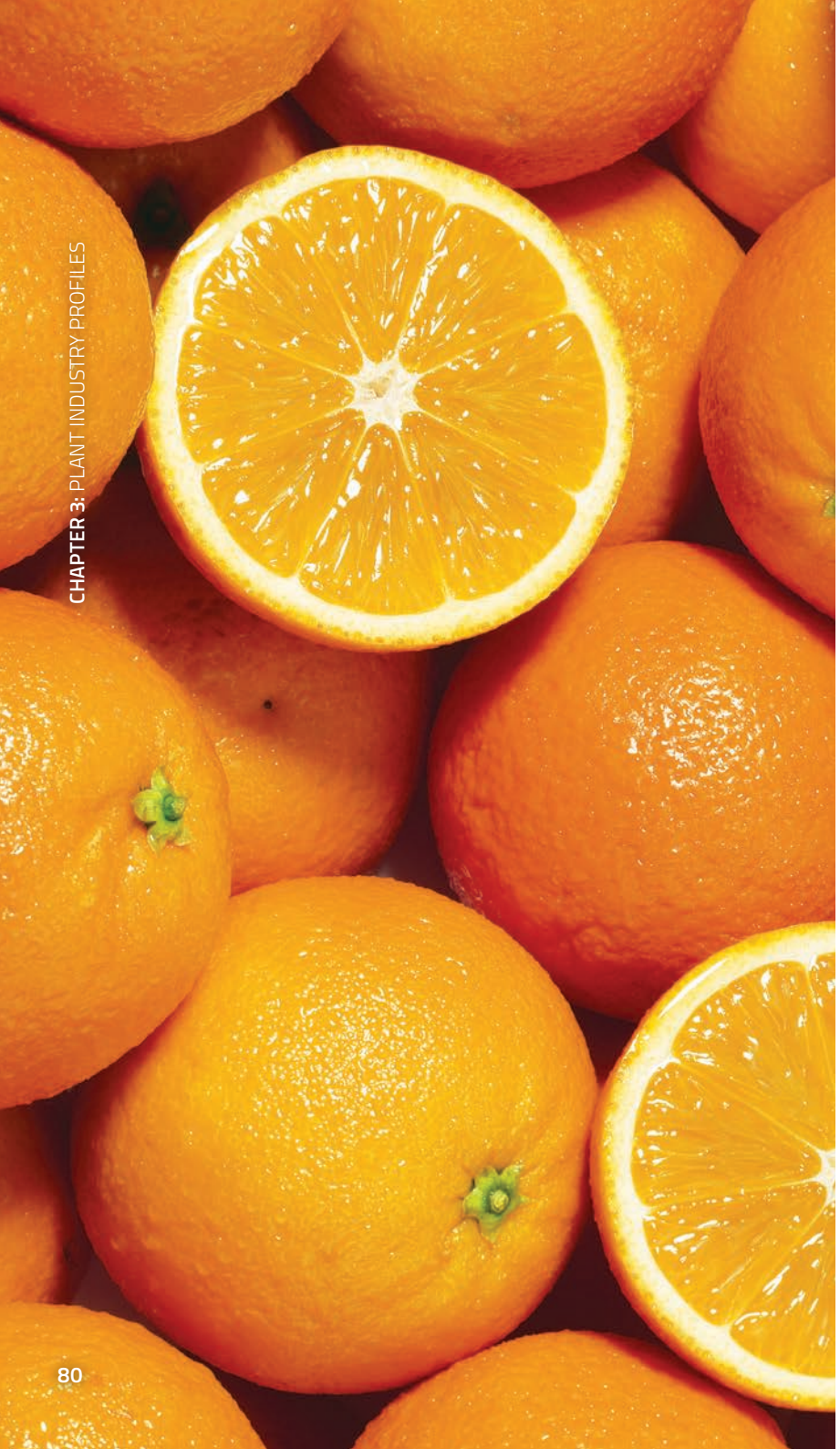


Figure 23. Distribution of chestnut production by state and territory, 2018–19 (based on LVP)





CITRUS

Represented by Citrus Australia
citrusaustralia.com.au

In 2018–19 production of oranges, mandarins, lemons, limes and grapefruit was valued at $783 million (LVP), with exports valued at $457 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 750,000 tonnes per annum, produced from approximately 27,000 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 QLD; Riverland in SA; the Murray Valley in VIC–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. Additional funding was 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 and the National Citrus Biosecurity Surveillance Strategy 2018–28.
See page 206 for information about the National Citrus Biosecurity Program.

Table 16. High Priority Pests of the citrus industry

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

Figure 24. Annual value of citrus production, 2007–19

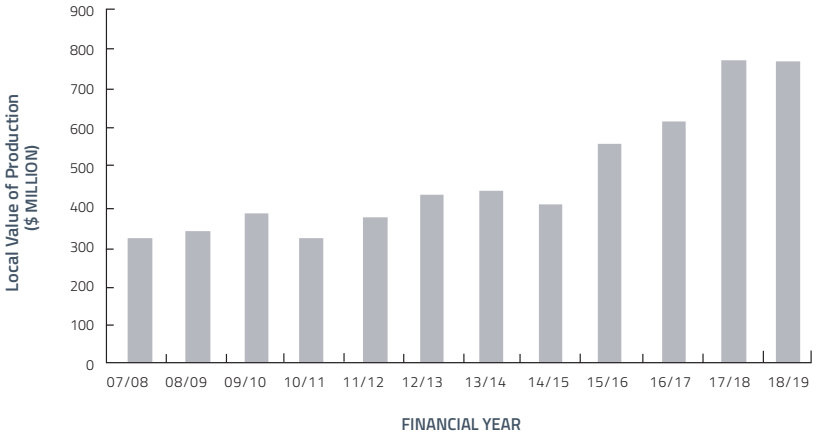
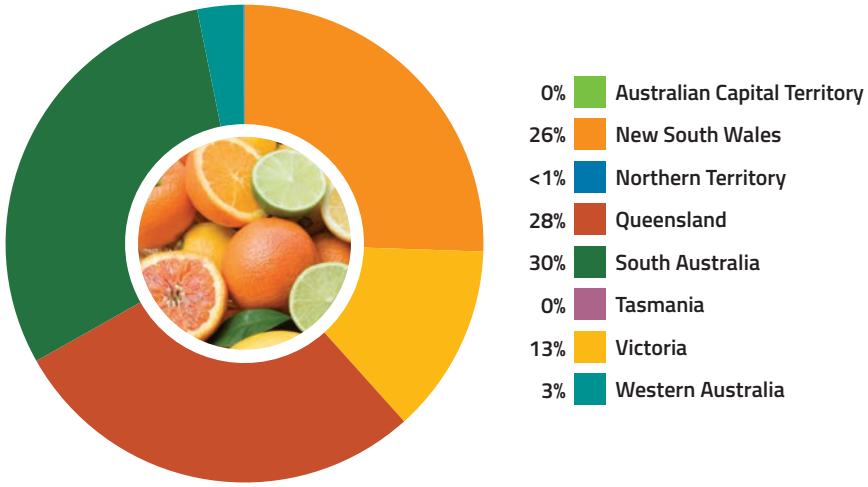


Figure 25. Distribution of citrus production by state and territory, 2018–19 (based on LVP)



COTTON

Represented by Cotton Australia
cottonaustralia.com.au

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. In 2018–19, cotton production was significantly reduced due to drought, valued at $1.1 billion (LVP).

Approximately 60 per cent of the national crop is grown in NSW, with the remainder grown in QLD and a small number of fields in VIC. 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.[31]

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, 2007–19

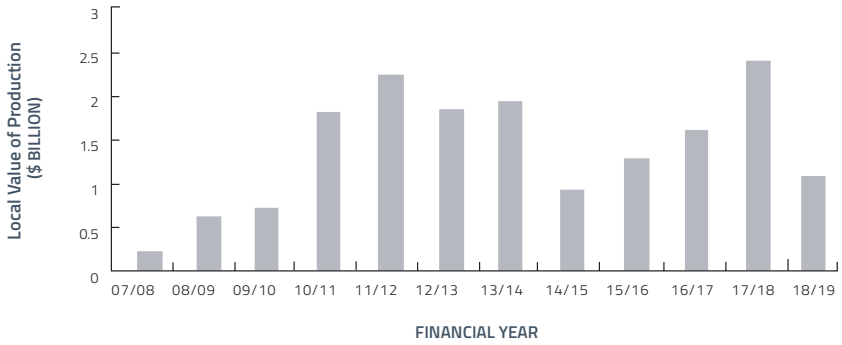
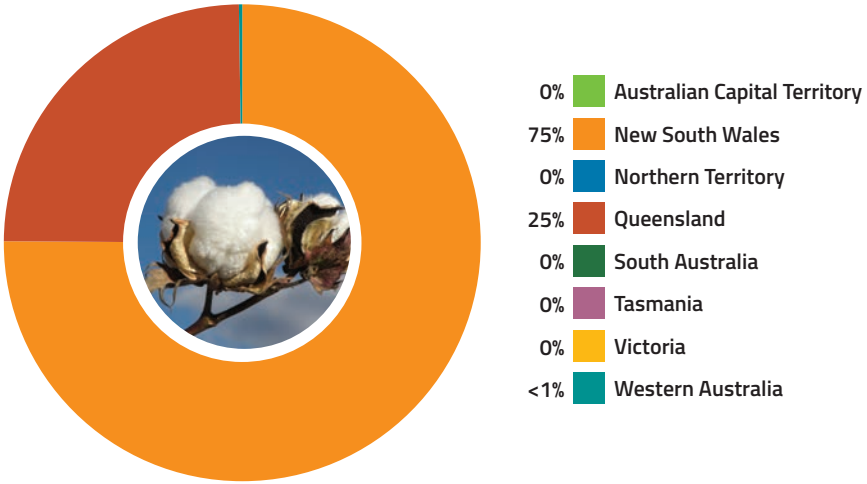


Table 17. High Priority Pests of the cotton industry

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

**established in Australia*

Figure 27. Distribution of cotton production by state and territory, 2018–19 (based on LVP)



31 Cotton Australia (2018). Australian Cotton Industry Statistics

DRIED FRUITS (GRAPES)

Represented by Dried Fruits Australia
driedfruitsaustralia.org.au

In 2018–19, dried grape production (sultana types, currants and raisins) had an estimated value of $30 million (LVP), with exports valued at $25.1 million. The 2021 crop is estimated to be 15,000 tonnes. Export markets for dried vine fruits include Europe and Asia. Total exports are expected to increase to over 5,000 tonnes over the next several years.

In Australia, grapes for the dried fruit industry are predominantly grown in the Sunraysia region which spans north western VIC and south-west 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 dried fruit growers through the major industry processors. The industry also undertakes EPPRD training in order to understand roles and responsibilities in a pest incursion.

A biosecurity levy will be in place from 1 January 2021 to enable the dried vine fruits industry value chain to be a contributing participant in national biosecurity related activities and project such as surveillance and emergency scenarios.

Table 18. High Priority Pests of the dried fruit industry

Scientific name	Common name
Candidatus Phytoplasma solani	Bois noir
Drosophila suzukii	Spotted wing drosophila
Grapevine red blotch-associated virus (Geminivirus) (with vector)	Grapevine red blotch associated virus, GRBaV
Guignardia bidwellii	Black rot
Halyomorpha halys	Brown marmorated stink bug
Lycorma delicatula	Spotted lanternfly
Trogoderma granarium	Khapra beetle
Xylella fastidiosa (subspecies 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, 2007–19

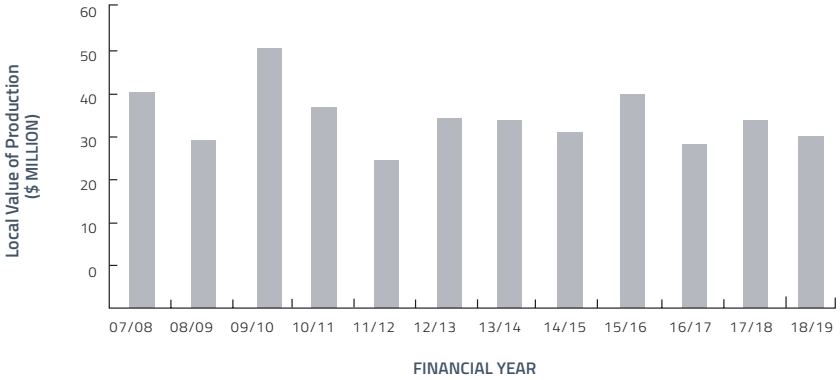
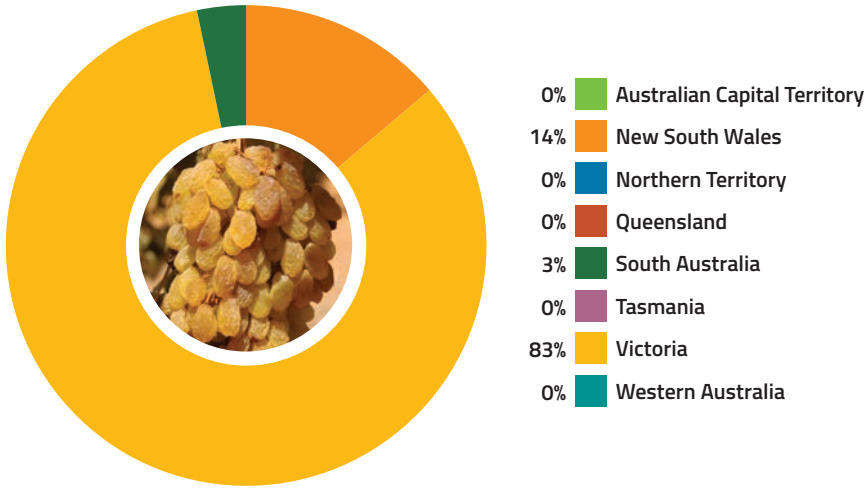


Figure 29. Distribution of dried fruit production by state and territory, 2018–19 (based on LVP)



GINGER

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

In 2018–19, ginger production was valued approximately $41 million (LVP). Land under cultivation was about 270 hectares that produced 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 QLD. Key growing districts are Gatton, Glasshouse Mountains, Beerwah, Yandina, Mary Valley, Maryborough and Bundaberg. Growers can also be found in northern NSW and far north QLD.

There are two varieties grown commercially: Jumbo (also known as Canton) and QLD, with 25 per cent sold to the processing sector and 75 per cent sold to the fresh market. No ginger is currently exported, and the industry is yet to develop a concrete plan for export.

Biosecurity is included in the AgriFutures 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, and information from PHA is shared regularly with members via meetings, newsletters and email up-dates.

Figure 30. Annual value of ginger production, 2010–19

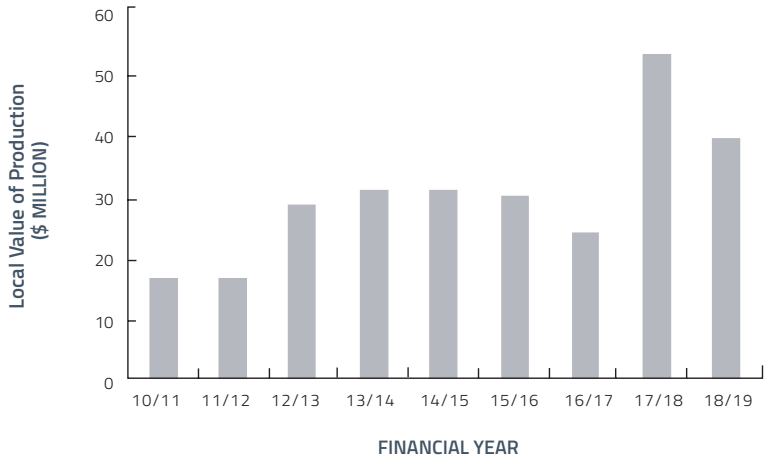
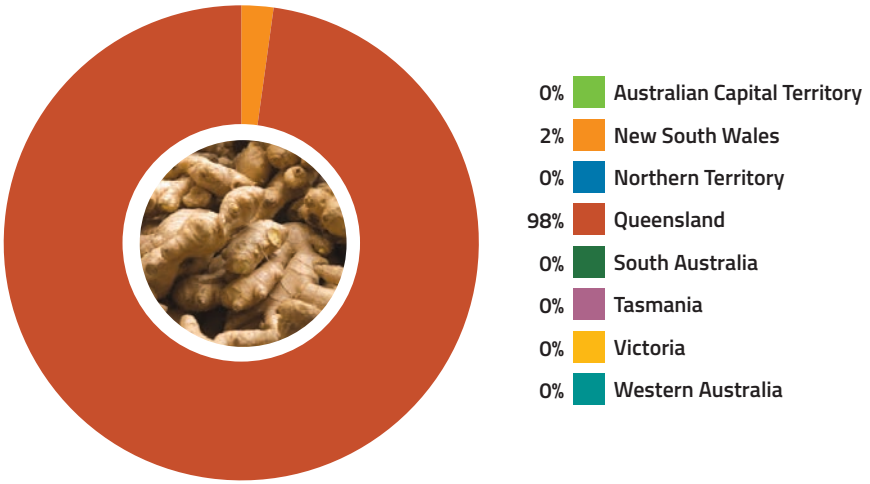


Table 19. High Priority Pests of the ginger industry

Scientific name	Common name
Aspidiella hartii	Yam scale
Meloidogyne enterolobii (syn. *Meloidogyne mayaguensis*)	Root knot nematode
Radopholus similis (exotic strains)	Burrowing nematode

Figure 31. Distribution of ginger production by state and territory, 2018–19 (based on LVP)



GRAINS

Represented by Grain Producers Australia
grainproducers.com.au

In 2018–19, grain production was valued approximately $11.8 billion (LVP) with exports valued at $7.8 billion. The grains industry accounts for 21 per cent of Australian agriculture's gross value of production and 16 per cent of agriculture's export income, making it Australia's largest plant industry.[32]

In an average year around 34 million tonnes of grain is produced from approximately 20 million hectares.[33] In the 2019–20 season, due to the second year of drought conditions for many of the grain producing regions of Australia, the winter cropping area was reduced to around 18 million hectares which produced a little over 27 million tonnes of grain. Due to feed shortages a large proportion of the grain was used domestically for stock feed during 2019–20.

It is estimated only 8–9 million tonnes were exported compared to an average of 11–12 million tonnes.

Most of Australia's grain is produced across the region known as the wheat belt, which stretches from central QLD through NSW, VIC, TAS, 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 205.

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. Implementation commenced in 2020 however, due to the impact of Covid-19, there were some delays in full implementation.

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.

Figure 32. Annual value of grain production, 2007–19

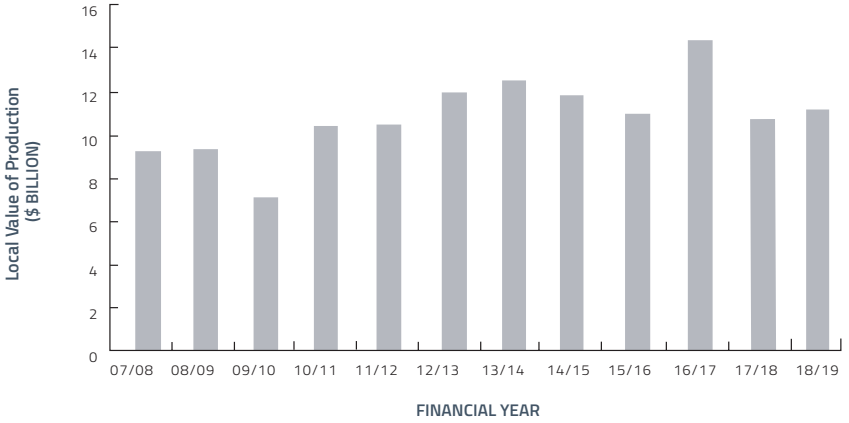
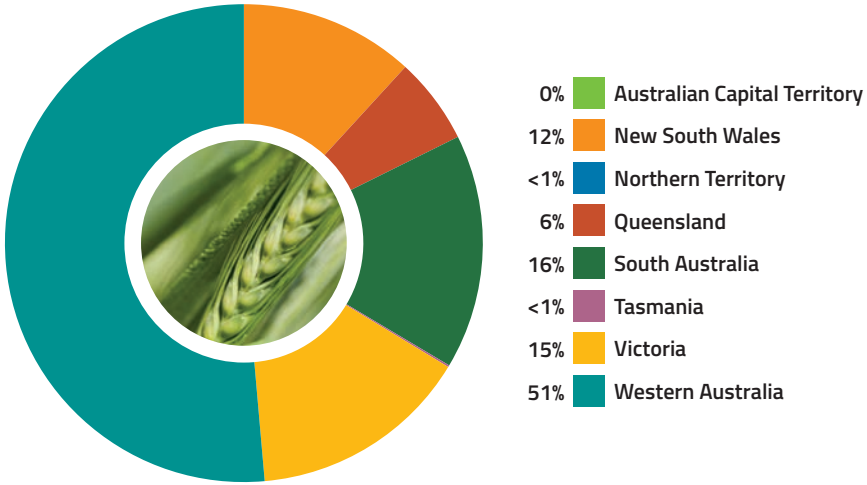


Figure 33. Distribution of grain production by state and territory, 2018–19 (based on LVP)



32 Australian Bureau of Agricultural and Resource Economics and Sciences. Agricultural commodities: March quarter 2021. Accessed 20 March 2021. agriculture.gov.au/abares/research-topics/agricultural-outlook/data#agricultural-commodities

33 Grains Research and Development Corporation. Our industry. Accessed online 12 March 2021 https://grdc.com.au/about/our-industry

Table 20. High Priority Pests of the grain industry

Scientific name	Common name
Ascochyta rabiei (MAT1-1)	Ascochyta blight
Barley mild mosaic virus (Bymovirus)	Barley mild mosaic virus
Bean common mosaic virus (Potyvirus), peanut stripe strain	Bean common mosaic virus
Cephus cinctus	Wheat stem sawfly
Cephus pygmeus	European wheat stem sawfly
Ceutorhynchus assimilis	Cabbage seedpod weevil
Ceutorhynchus napi	Rape stem weevil
Ceutorhynchus pallidactylus	Cabbage stem weevil
Chickpea chlorotic dwarf virus (Mastrevirus) (syn. *Chickpea chlorotic dwarf virus* (Geminivirus)	Chickpea chlorotic dwarf virus
Chickpea chlorotic stunt virus (Polerovirus)	Chickpea chlorotic stunt virus
Chilo orichalcociliellus	Coastal stem borer
Chilo partellus	Spotted stem borer
Colletotrichum truncatum (lentil strain)	Lentil anthracnose
Cylindrocopturus adspersus	Sunflower stem weevil
Diabrotica barberi	Northern corn root worm
Diabrotica undecimpunctata	Southern corn root worm
Diabrotica virgifera	Western corn root worm
Diaporthe helianthi (syn. *Phomopsis helianthi*)	Sunflower stem canker
*Diuraphis noxia**	Russian wheat aphid
Eurygaster integriceps	Sunn pest
Fusarium oxysporum f. sp. *ciceris*	Fusarium wilt of chickpea
Fusarium oxysporum f. sp. *glycines*	Fusarium wilt of soybean
Fusarium oxysporum f. sp. *lupini*	Fusarium wilt of lupin
Fusarium virguliforme	Sudden death syndrome
Groundnut bud necrosis virus (Tospovirus)	Bud necrosis disease
Groundnut ringspot virus (Tospovirus)	Groundnut ringspot virus
Harpophora maydis (syn. *Acremonium maydis*, *Cephalosporium maydis*)	Late wilt
Heterodera ciceri	Chickpea cyst nematode
Heterodera filipjevi	Cereal cyst nematode
Heterodera glycines	Soybean cyst nematode
Heterodera latipons	Mediterranean cereal cyst nematode
Heterodera sorghi	Sorghum cyst nematode
Homoeosoma electellum	Sunflower moth
Magnaporthe grisea	Rice blast
Mayetiola destructor	Hessian fly
Mayetiola hordei	Barley stem gall midge
Mungbean yellow mosaic virus, mungbean yellow mosaic India virus, dolichos yellow mosaic virus, horsegram yellow mosaic virus (Begomovirus)	Mungbean yellow mosaic virus
Nysius huttoni	Wheat bug
Pantoea stewartii	Stewart's wilt of maize
Peanut clump virus (Pecluvirus)	Peanut clump virus
Peronosclerospora philippinensis	Philippine downy mildew of maize
Peronosclerospora sorghi	Downy mildew of sorghum
Plasmopara halstedii	Downy mildew of sunflower
Prostephanus truncatus	Larger grain borer
Puccinia graminis f. sp. *tritici* (exotic pathogenic races e.g. Ug99)	Stem rust of wheat
Puccinia striiformis f. sp. *hordei*	Barley stripe rust
Rhizoctonia solani f. sp. *sasakii* (AG1) (teleomorph *Corticium sasakii* (syn. *Thanatephorus cucumeris*)	Banded leaf, sheath spot
Riptortus dentipes	Pod sucking bug
Schizaphis graminum	Greenbug
Soil-borne wheat mosaic virus (Furovirus)	Soil-borne wheat mosaic virus
Thaumatotibia leucotreta (syn. *Cryptophlebia leucotreta*)	False codling moth
Tilletia indica	Karnal bunt
Trogoderma granarium	Khapra beetle
Zea mosaic virus (Potyvirus)	Zea mosaic virus

*established in Australia

HAZELNUTS

Represented by Hazelnut Growers of Australia
hazelnutgrowersaustralia.org.au

In 2018–19, hazelnut production was valued at $3.0 million (LVP), with exports valued at $0.1 million.

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 2020. The industry estimates that by 2022 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, Narrandera, and north-east VIC around Myrtleford. They are also grown in central and eastern VIC and increasingly in northern TAS.

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 2020, Hazelnut Growers of Australia was involved in a number of responses to pest incursions affecting the hazelnut industry.

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 Hazelnut Industry Australia – Premium Australian Hazelnuts – Strategic Blueprint 2030, 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
Anisogramma anomala	Eastern filbert blight, hazelnut blight
Chinavia hilaris (syn. *C. hilare*)	Green stink bug
Halyomorpha halys	Brown marmorated stink bug
Lymantria dispar	Gypsy moth (Asian and European strains)
Phytophthora ramorum	Sudden oak death

Figure 34. Annual value of hazelnut production, 2010–19

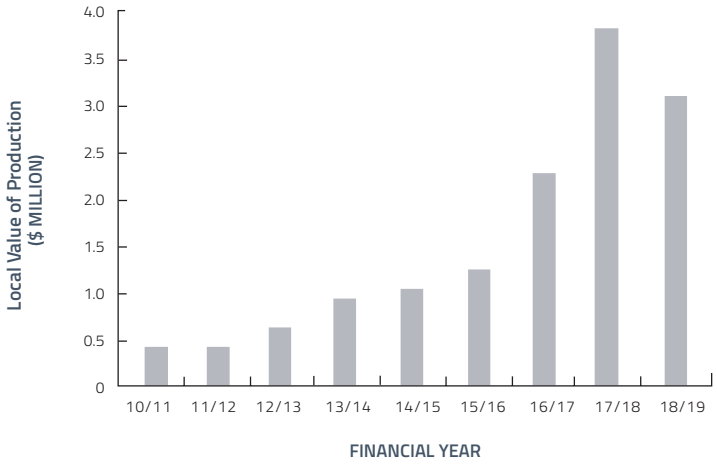
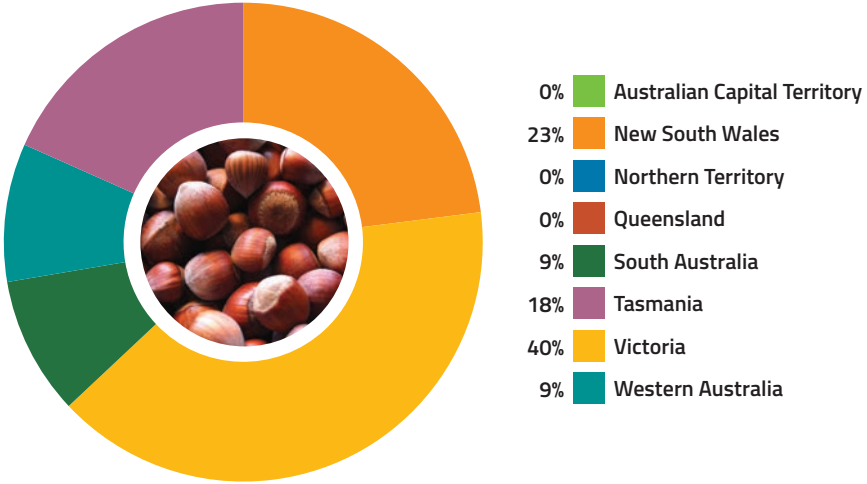


Figure 35. Distribution of hazelnut production by state and territory, 2018–19 (based on LVP)



HONEY BEES

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

In 2018–19, honey and beeswax production was valued at $162 million (LVP), and the unrecognised value of pollination is believed to be in the order of $14.2 billion.[34] There are approximately 25,000 registered beekeepers in Australia operating around 672,216 hives. Over 531,786 hives are operated by commercial beekeepers (those who have more than 50 hives).

The industry also exports live bees, and Australian beeswax commands a premium price overseas. Trade relies on the healthy status of Australia's bees, with high values attributed to the lack of residue from miticides that are 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.[35]

AHBIC works in partnership with other industries and governments to protect the health of bees with several biosecurity initiatives including the National Bee Pest Surveillance Program and the development of the Australian Honey Bee Industry Biosecurity Code of Practice.

The National Bee Pest Surveillance Program operates at ports around Australia to provide an early detection mechanism for exotic bees and pests of bees. More about this program is on page 154. This program is due to end on 12 December 2021, and its continuation is currently being considered.

The Australian Honey Bee Industry Biosecurity Code of Practice was endorsed nationally by the honey bee industry in 2016. The aim of the Code is to improve the management of established pests and diseases, and increase preparedness and surveillance for exotic pest threats. Parts of the Code have now been incorporated into beekeeping legislation by NSW, SA and VIC.

The honey bee industry also funds the National Bee Biosecurity Program, a partnership between industry and government, which employees Bee Biosecurity Officers (BBO) in all Australian states. BBOs provide training and education to help beekeepers implement biosecurity measures and ensure they are complying with the Code of Practice and relevant legislation (see page 24).

Following the detection of Varroa mites (*Varroa jacobsoni*) on Asian honey bees (AHB) in Townsville in June 2016, DAWE established the National Varroa Mite Eradication Program (NVMEP), of which AHBIC has been a part. No AHB or Varroa mites associated with this incident have been found since November 2016 and proof of freedom has been completed.

Suspect Varroa mites (*V. jacobsoni*) were again detected on AHB 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. In April 2020, a further nest of AHB was detected at the Port of Townsville and *V. jacobsoni* were also detected from the nest. These were found to be genetically different from the 2016 and 2019 incursions. The NVMEP has been extended to include this incursion and proof of freedom is expected to be achieved in April 2021.

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

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

Figure 36. Annual value of honey bee and beeswax production, 2007–19

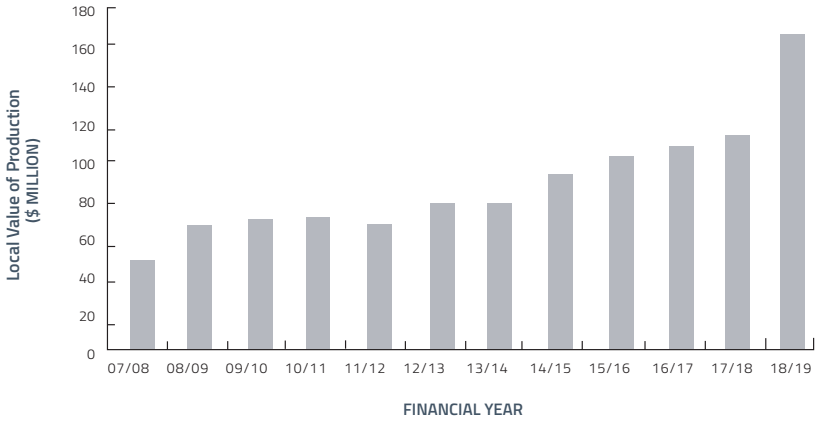


Figure 37. Distribution of honey and beeswax production by state and territory, 2018–19 (based on LVP)

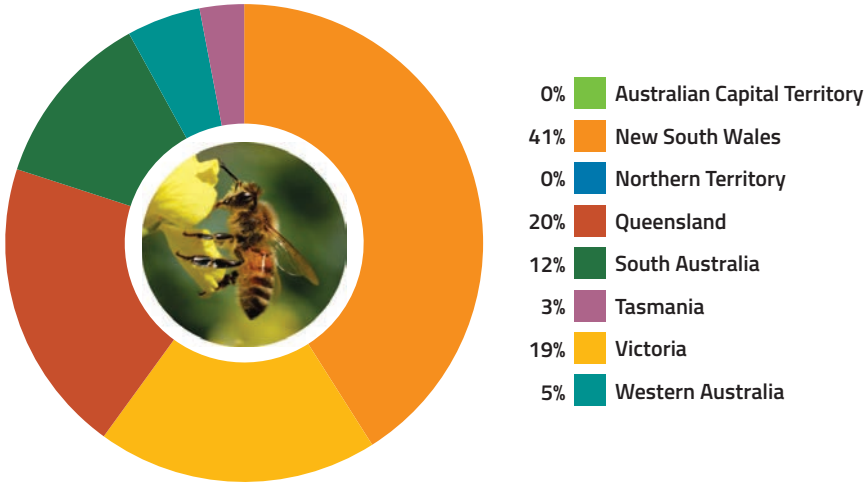


Table 22. High Priority Pests of the honey bee industry

Scientific name	Common name
Acarapis woodi	Tracheal mite
Acute bee paralysis virus (Cripavirus)	Acute bee paralysis virus, ABPV
Apis cerana (exotic strains, genotypes and sub-species)	Asian honey bee
Apis mellifera capensis	Cape honey bee
Apis mellifera scutellata	African honey bee
Apis mellifera scutellata (hybrid)	Africanised honey bee
Deformed wing virus (Iflavirus)	Deformed wing virus
Hoplostoma fuligineus	Large hive beetle
Slow paralysis virus (Iflavirus)	Slow paralysis virus
Tropilaelaps clareae	Tropilaelaps mite
Tropilaelaps mercedesae	Tropilaelaps mite
Varroa destructor	Varroa mite
Varroa jacobsoni	Varroa mite
Vespa spp. (exotic species including *V. orientalis, V. velutina, V. crabro*)	Hornets

LYCHEES

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

In 2018–19, lychee production was valued approximately $34 million (LVP), with exports valued at $7.4 million. Currently, the industry's annual production ranges between 2,500–3,000 tonnes. Lychees are grown in QLD and NSW. The harvest season begins in October in far north QLD and moves down through to NSW until early April.

Lychees were introduced into Australia more than 100 years ago and over this time the industry has developed from a 'small exotic fruit' industry into a progressive and robust industry. The demand for Australian lychees is on the increase domestically and overseas. Australian lychee exports to the United States continue to increase, with 24 tonnes exported in the 2019–20 season. These increases are expected to continue each year as more growers register for this export market.

Annual production is currently meeting the domestic demand and consumption with 20–25 per cent of production for export markets. New plantings will steadily increase the annual production as trees reach maturity and anticipated yield. It is anticipated that annual production will increase by up to 75 per cent, 5,000–5,500 tonnes within the next 10 years. A balance needs to be retained between domestic and export supply to ensure the industry continues to grow while maintaining its viability and sustainability for all lychee growers.

The Kwai Mai Pink lychee is the most widely grown variety in Australia. It is well regarded by Australian consumers for appearance, shelf life, taste and price. Kwai Mai Pink has become the main export variety especially to Hong Kong, USA, New Zealand and Canada. The late-cropping Wai Chee is also gaining export recognition with the small seeded Salathiel popular with buyers in Singapore. Other well-known varieties include: Tai So, Fay Zee Siu, Souey Tung, Sah Keng and Kaimana. Over the past 10 years, newer varieties have been developed and are now becoming popular with the Australian growers and consumers. These include: Chompogo, Baitaying, Erdon Lee, Linsansue, Red Ball, Sansuelin and Shuang Balia. Due to poor fruit set and irregular flowering, growers are now planting more of the newer varieties and phasing out the older varieties, Tai So, Fay Zee Siu and Souey Tung.

Table 23. High Priority Pests of the lychee industry

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

Figure 38. Annual value of lychee production 2009–19

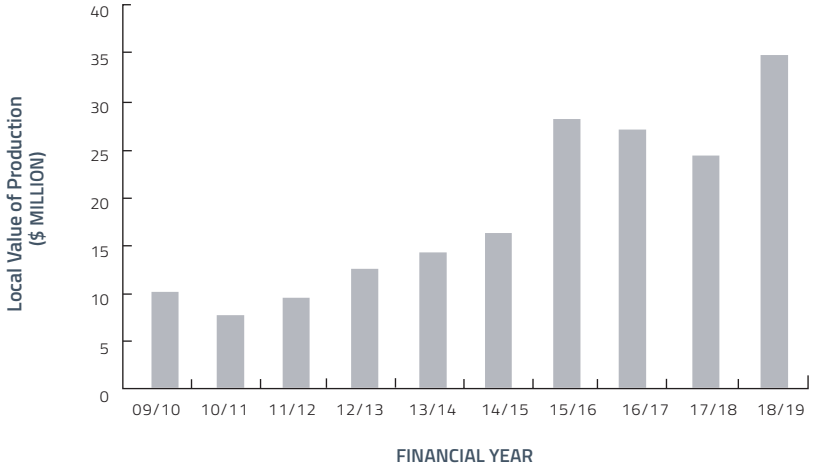
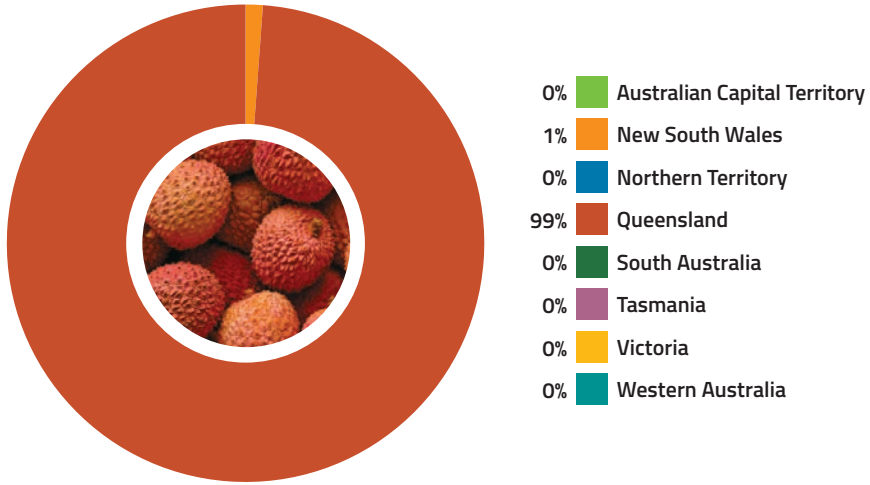


Figure 39. Distribution of lychee production by state and territory, 2018–19 (based on LVP)



MACADAMIAS

Represented by the Australian Macadamia Society
australian-macadamias.org

In 2018–19, macadamia production was valued at $245 million (LVP) with exports valued at $257 million. Annual macadamia production has more than tripled in the last 10 years. The export value of the Australian industry grew by 9.3 per cent in the 12 months to June 2019.

Approximately 75 per cent of the crop is exported, principally to Europe, the United States, Japan, South Korea, Taiwan 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, United States, the rest of Africa and South America are also significant producers. There are now approximately 800 macadamia growers with 33,000 hectares of crop under planting 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 QLD, from Port Macquarie in the south through to the Atherton Tablelands in the north. Collectively Bundaberg and the Northern Rivers region produce more than 80 per cent of the Australian crop. Production is growing fastest in Bundaberg in QLD and the Clarence Valley in NSW. New plantings are also being developed in Mackay and Maryborough in QLD 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
Hypothenemus obscurus	Tropical nut borer
Phytophthora ramorum	Sudden oak death
Tropilaelaps clareae	Tropilaelaps mite
Tropilaelaps mercedesae	Tropilaelaps mite
Varroa destructor	Varroa mite
Xylella fastidiosa (including *X. fastidiosa* subsp. *fastidiosa, X. fastidiosa* subsp. *multiplex, X. fastidiosa* subsp. *piercei*) (with vector)	Almond leaf scorch, pecan bacterial leaf scorch

Figure 40. Annual value of macadamia production 2007–19

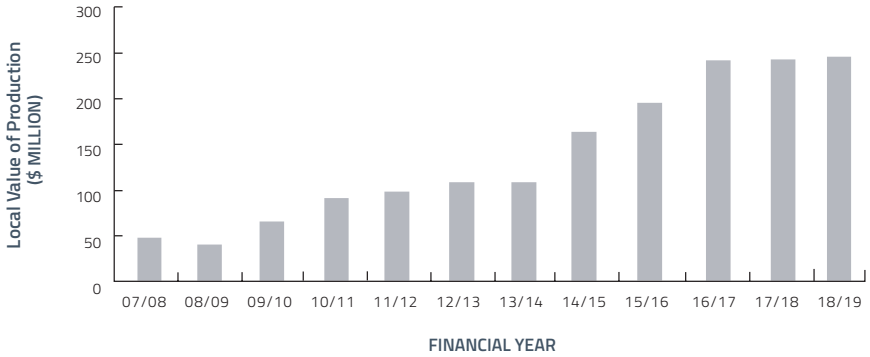
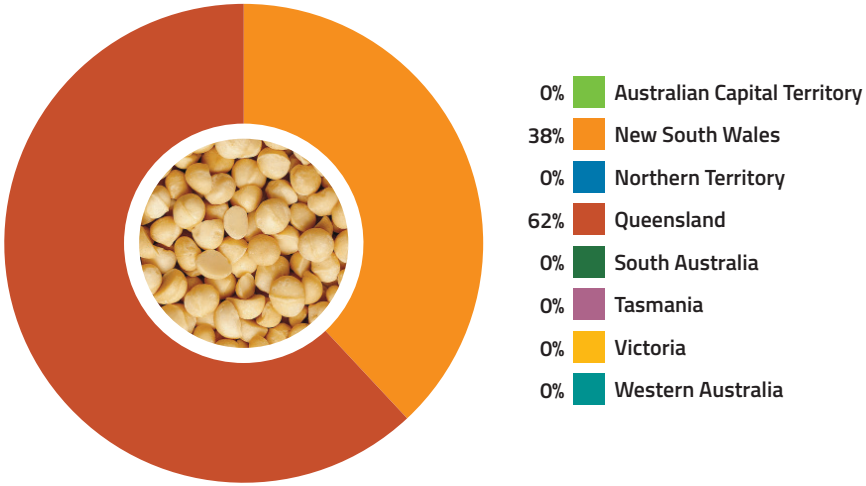


Figure 41. Distribution of macadamia production by state and territory, 2018–19 (based on LVP)



MANGOES

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

In 2018–19, mango production was valued at $110 million (LVP), with exports valued at $30.7 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 41 per cent of Australian production.

Other varieties include B74 (Calypso), Honey Gold, and R2E2, green eating varieties such as Keow Savoey, Falan 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 QLD 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. This and other associated documents were reviewed in 2020.

Figure 42. Annual value of mango production, 2007–19

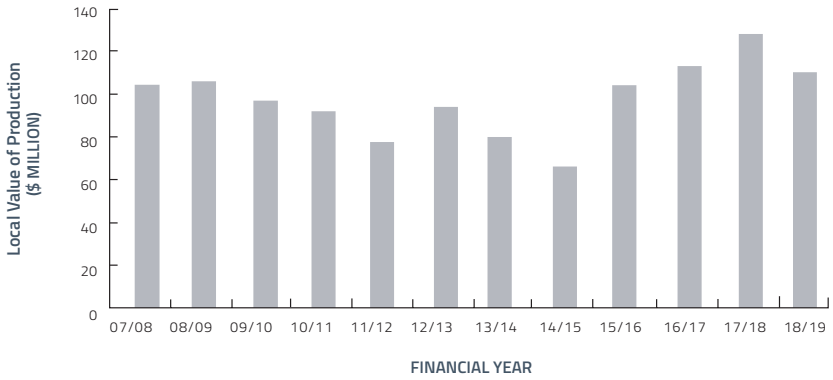


Figure 43. Distribution of mango production by state and territory, 2018–19 (based on LVP)

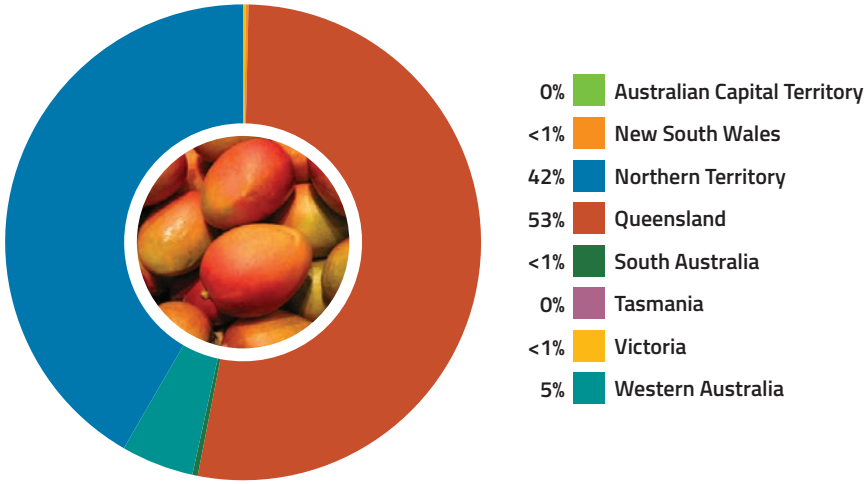


Table 25. High Priority Pests of the mango industry

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

MELONS

Represented by the Australian Melon Association
melonsaustralia.org.au

In 2018–19 melon production was valued at $151 million (LPV), with exports valued at $37 million.

The Australian melon industry consists of approximately 250 growers producing, on average around 230,000 tonnes of melons annually across 8,500 hectares. Melons are produced in every mainland Australian state with the majority of production in QLD, NSW, NT and WA. 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 main destinations for melon exports are New Zealand, United Arab Emirates, Japan, Malaysia, Hong Kong and Singapore.

The Australian melon industry has a research and development levy, a PHA levy and an Emergency Plant Pest Response levy, currently set at zero. The industry contributes 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 biosecurity issues. In 2020, the melon industry updated their biosecurity plan and an on-farm biosecurity planner has been developed with NSW Department of Primary Industries.

Figure 44. Annual value of melon production, 2010–19

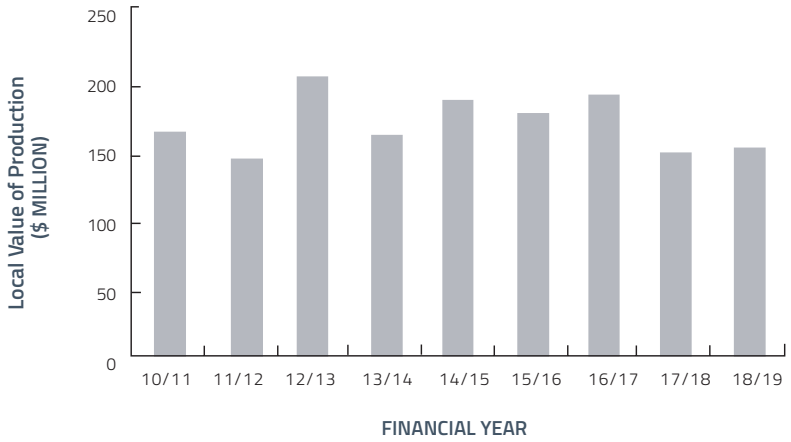
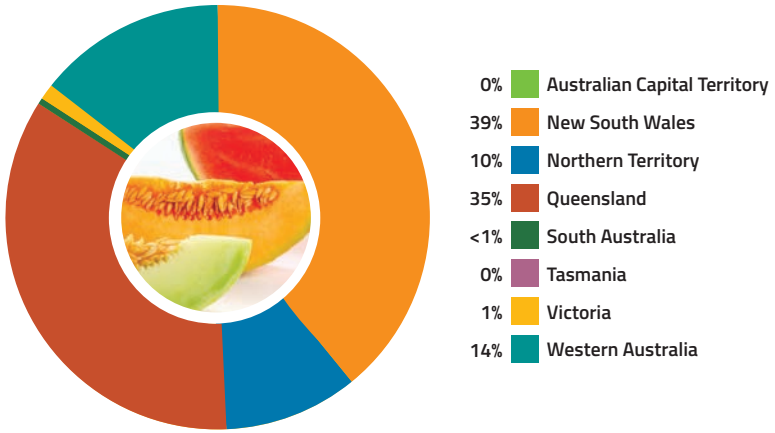


Table 26. High Priority Pests of the melon industry

Scientific name	Common name
Bemisia tabaci (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
Erwinia tracheiphila	Cucurbit bacterial wilt
Fusarium oxysporum f. sp. *lagenariae*	Fusarium root and stem rot of melons
Fusarium oxysporum f. sp. *melonis* (exotic races)	Fusarium root and stem rot of melons
Fusarium oxysporum f. sp. *niveum* (exotic races)	Fusarium root and stem rot of melons
Fusarium oxysporum f. sp. *radicis-cucumerinum*	Fusarium root and stem rot of melons
Groundnut bud necrosis virus (Tospovirus)	Bud necrosis disease
Kyuri green mottle mosaic virus (Tobamovirus)	Tobamovirus group, KGMMV
Liriomyza bryoniae	Tomato leaf miner
Liriomyza sativae	Vegetable leaf miner, American leaf miner
Melon severe mosaic virus (Tospovirus)	Tospovirus, melon severe mosaic
Melon yellow spot virus (Tospovirus)	Tospovirus group
Monosporascus cannonballus	Monosporascus root rot
Phomopsis cucurbitae (syn. *Diaporthe melonis*)	Melon black rot, phomopsis fruit rot
*Spodoptera frugiperda**	Fall armyworm
Watermelon bud necrosis virus (Tospovirus)	Watermelon bud necrosis
Watermelon green mottle mosaic virus (Tobamovrus)	Tobamovrus
Watermelon silver melon virus (Tobamovrus)	Tobamovrus
Zeugodacus curcubitae (syn. *Bactrocera cucurbitae*)	Melon fruit fly
Zuccchini green mottle mosaic virus (Tobamovirus)	Tobamovirus group, ZGMMV

**established in Australia*

Figure 45. Distribution of melon production by state and territory, 2018–19 (based on LVP)



OLIVES

Represented by the Australian Olive Association
australianolives.com.au

In 2018–19 Australian olive production was valued at $112 million (LVP), with only 49,750 tonne of fresh olives produced, significantly down from the 125,000 tonnes in the previous year. Ten million trees are grown on 450 commercial groves covering 20,568 hectares, with 70 per cent of olive trees concentrated across 20 groves.

In 2019-20 production of olive oil was 9,750 tonne (down from 20,000 tonne in the previous year), or 10 million litres, 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 then new growers have purchased olive groves 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 46. Annual value of olive production, 2007–19

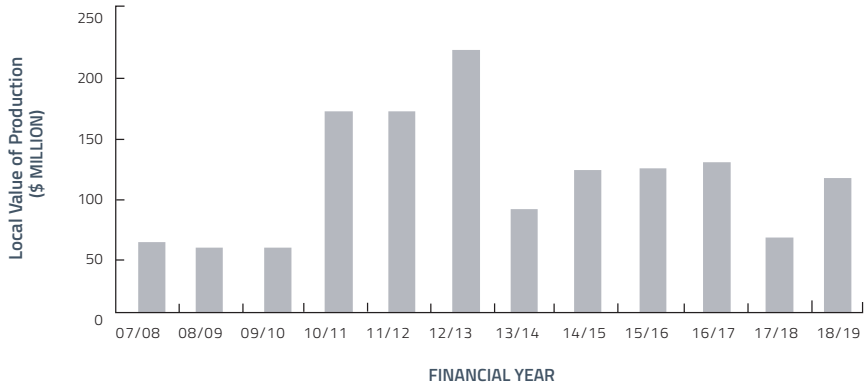
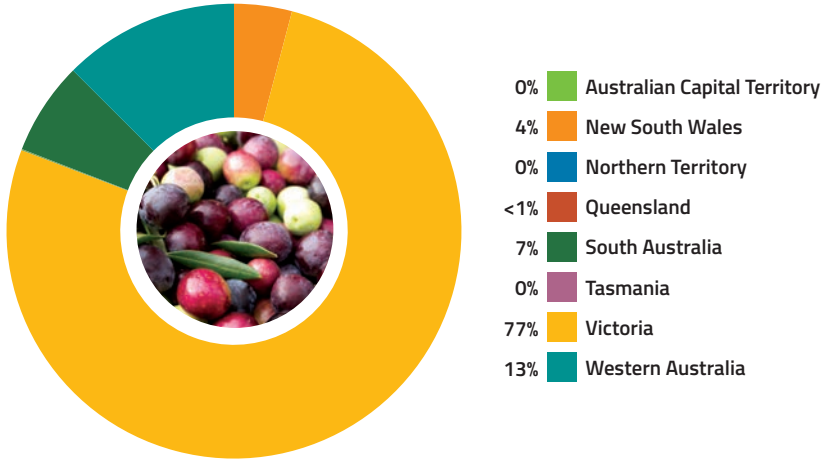


Table 27. High Priority Pests of the olive industry

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

Figure 47. Distribution of olive production by state and territory, 2018–19 (based on LVP)



ONIONS

Represented by Onions Australia
onionsaustralia.org.au

In 2018–19, onion production was valued at $215 million (LVP) with fresh exports valued at $39.2 million.

Onions are grown in most states, but SA and TAS together produce 66 per cent of the Australian crop. Key onion production locations are the Lockyer Valley in QLD, north-eastern regions and the Adelaide Plains of SA and the Devonport–Launceston region of TAS. 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.

Table 28. High Priority Pests of the onion industry

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

Figure 48. Annual value of onion production, 2007–19

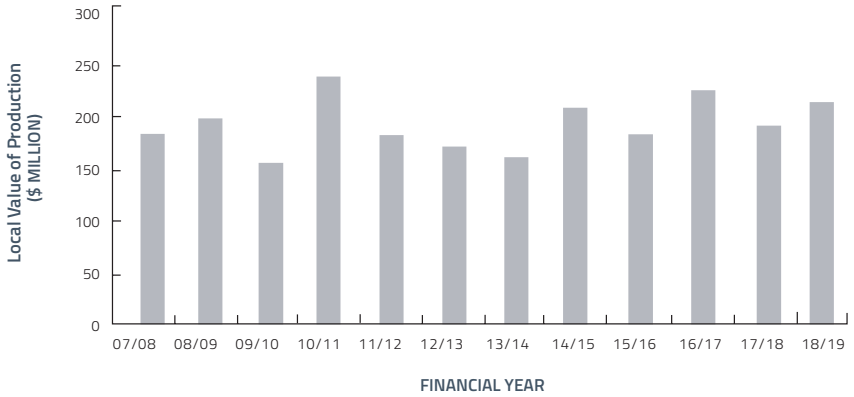
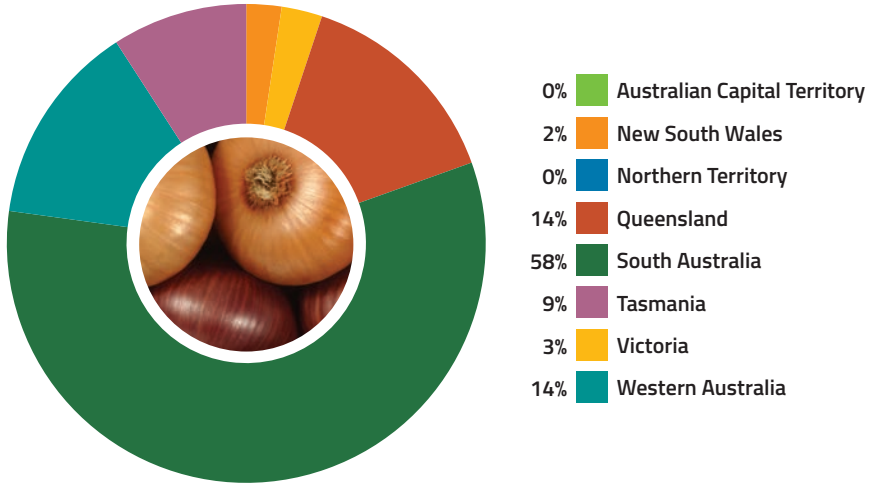


Figure 49. Distribution of onion production by state and territory, 2018–19 (based on LVP)



PASSIONFRUIT

Represented by Passionfruit Australia
passionfruitaustralia.org.au

In 2018–19, passionfruit production of 4,469 tonnes of fruit was valued at $19 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 QLD, and around one third in NSW. The industry is starting to expand in WA, and there are new plantings in the NT and VIC.

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

Figure 50. Annual value of passionfruit production, 2007–19

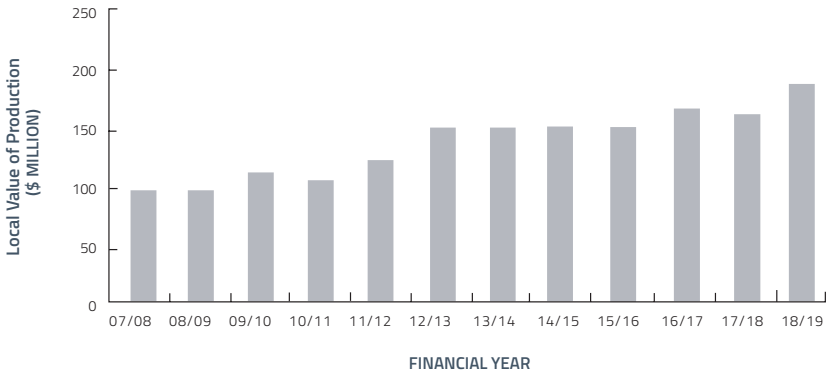
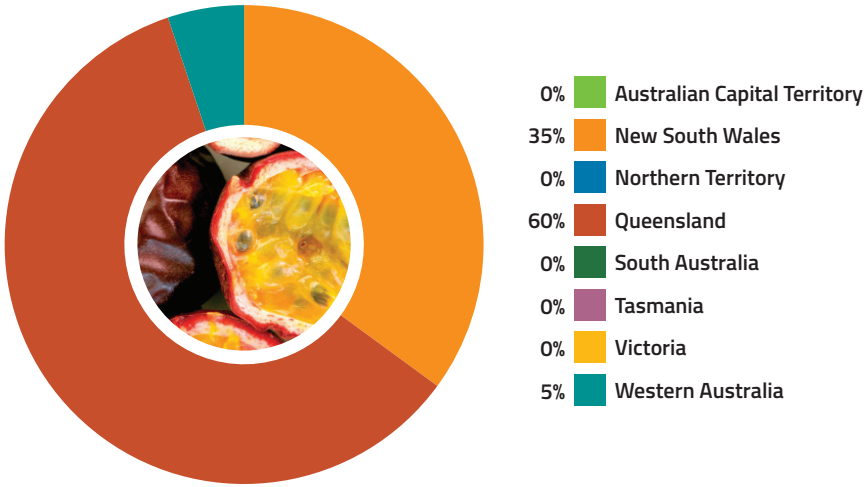


Figure 51. Distribution of passionfruit production by state and territory, 2018–19 (based on LVP)



PINEAPPLES

Represented by GROWCOM
growcom.com.au

In 2018–19 production was valued at $47 million (LVP). The industry estimates that in 2020 around 49,577 tonnes of fresh fruit and 21,056 tonnes of process fruit were marketed. The farm gate value for fresh fruit is $1,140 per tonne and the average price for processed fruit is $366 per tonne.

There are approximately 75 commercial pineapple enterprises, with all but one based in QLD. Key growing districts are in Wamuran, Elimba, 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, Kraft Heinz – Golden Circle Ltd, produces canned pineapple and juice accounting for 91 per cent of the processed fruit.

Approximately 69 per cent of the pineapple varieties grown are smooth Cayenne and 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
Cotinis mutabilis	Fig beetle
Dickeya spp. (pineapple infecting strains) (syn. *Erwinia chrysanthemi*)	Bacterial fruit collapse, bacterial heart rot
Dysmicoccus neobrevipes	Grey pineapple mealybug
Fusarium spp. (*F. ananatum* and *F. guttiforme* syn. *F. subglutinans* f. sp. *ananas*)	Fusariosis, fusarium stem rot, pineapple eye rot, fruitlet core rot
Strymon megarus (as a vector of fusariosis)	Pineapple fruit borer
Thaumatotibia leucotreta (syn. *Cryptophlebia leucotreta*)	False codling moth

Figure 52. Annual value of pineapple production, 2007–19

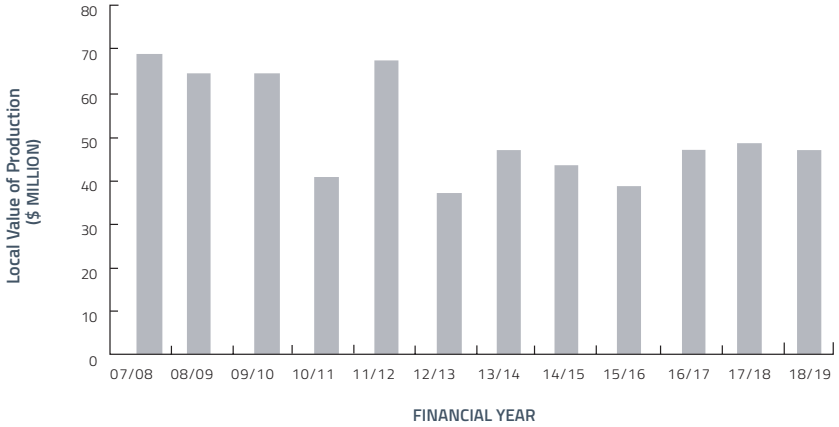
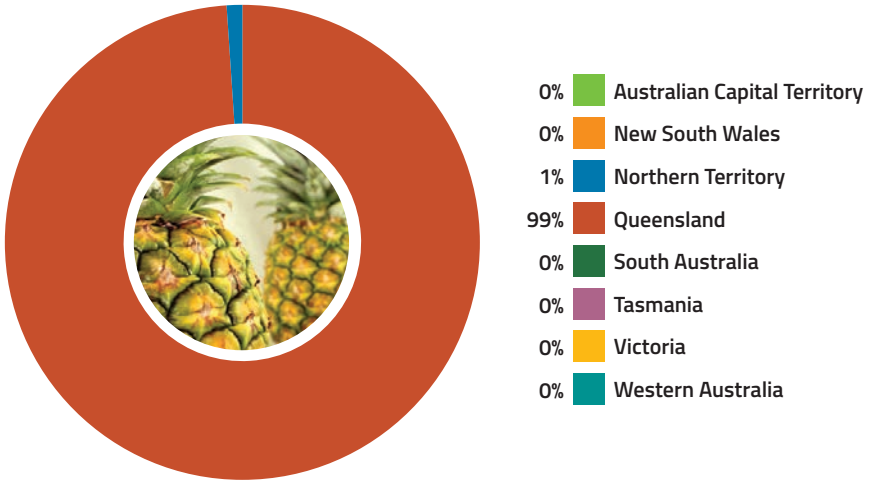


Figure 53. Distribution of pineapple production by state and territory, 2018–19 (based on LVP)



PISTACHIOS

Represented by the Pistachio Growers' Association Inc
pgai.com.au

In 2018–19, pistachio production was valued at $27 million (LVP), with exports valued at $16.6 million. In 2020, there were approximately 2,000 hectares (bearing and non-bearing) under cultivation with 2,900 tonnes of pistachio nuts produced from the productive orchards.

Major production areas are along the Murray River Valley between Swan Hill in VIC and Waikerie in SA. Further plantings are in central-west VIC and Pinnaroo, SA, with small plantings in WA. 180 hectares of new orchards were planted in 2018, 200 in 2019 and 220 in 2020 representing a total of 1,165 new hectares since 2014. None of this new orchard is currently in production. There are five large pistachio orchards and another five orchards of 10 to 15 hectares, which is the acknowledged size required to make a living solely from pistachio nut production. 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 2022 and to 12,000 tonnes by 2030.

Australia is free from major pests and diseases that affect pistachios overseas. Biosecurity is a priority for the industry, with aspects of biosecurity embedded in the Pistachio Industry Australia – the Premium Healthy Nut – Strategic Blueprint 2030, and in two completed Hort Innovation research projects (PS16000 and 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
Amyelois transitella	Navel orange worm
Chinavia hilaris (syn. *C. hilare*)	Green stink bug
Leptoglossus clypealis	Leaf footed bug
Leptoglossus occidentalis	Western conifer seed bug
Leptoglossus zonatus	Western leaf footed bug
Lymantria dispar	Gypsy moth (Asian and European strains)
Trogoderma granarium	Khapra beetle
Verticillium dahliae (exotic defoliating strains)	Verticillium wilt

Figure 54. Annual value of pistachio production 2008–19

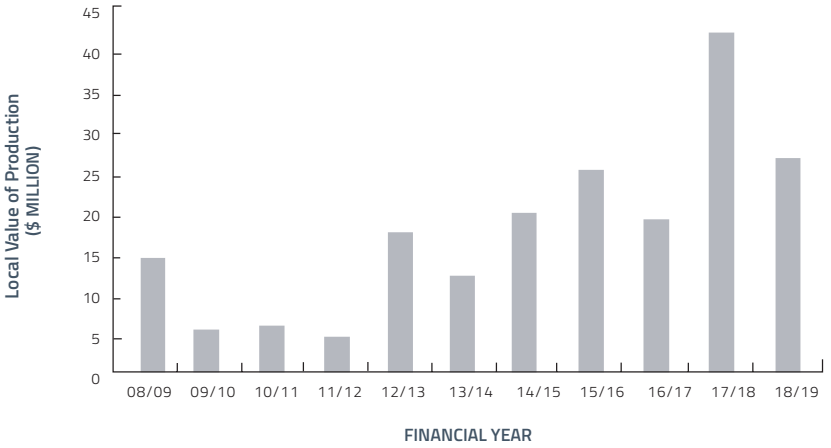
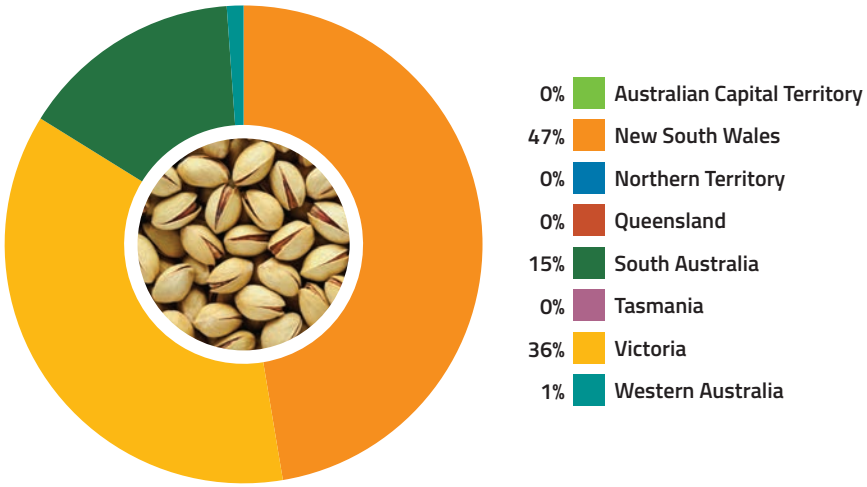


Figure 55. Distribution of pistachios by state and territory, 2018–19 (based on LVP)



PLANTATION FORESTS

Represented by the Australian Forest Products Association (AFPA)
ausfpa.com.au

In 2018–19, plantation forestry production was valued at $2.4 billion (LVP),[36] with wood product exports valued at $3.9 billion.[37] 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 132 million hectares of native forest on public and private land and two million hectares of plantation forestry. Of this native forest, only 78,000 hectares is harvested for timber production 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.

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, QLD, VIC, WA and TAS and are defined as crown land managed for a range of values including wood harvesting, water supply, conservation, recreation and environmental protection.

Plantation species are split 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. Most softwood grown in Australia is *Pinus radiata*, which is the dominant species in SA, WA, NSW, VIC and TAS. *P. elliottii* and *P. caribaea* are also grown in QLD 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 QLD 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. Dominant species planted include *Eucalyptus globulus*, *E. nitens* and *E. regnans*. There are also some plantings of *Acacia mangium*, African mahogany, grown in the NT. In 2015–16, there were 32,000 hectares of sandalwood plantations in the NT, QLD and WA. This estate comprised approximately 17,900 hectares (56%) of *Santalum spicatum* and 14,100 hectares (44%) of Indian sandalwood (*S. album*).[38]

In 2015, Forest and Wood Products Australia funded the development of the Biosecurity Manual for the Plantation Timber Industry and is currently supporting the development of the Plantation Forests Biosecurity Plan 2021–26. In 2017–18, the DAWE with support from the AFPA, funded the development of a National Forest Biosecurity Surveillance Strategy 2018–23.

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

37 Australian Bureau of Agricultural and Resource Economics and Sciences. Agricultural commodities: March quarter 2021. Accessed 20 March 2021. agriculture.gov.au/abares/research-topics/agricultural-outlook/data#agricultural-commodities

38 Australian Bureau of Agricultural and Resource Economics and Sciences. Australia's State of the Forests Report 2018. Accessed online 15 July 2021. agriculture.gov.au/sites/default/files/abares/forestsaustralia/documents/sofr_2018/web%20accessible%20pdfs/SOFR_2018_web.pdf

Since April 2020, AFPA has funded the position of National Forests Biosecurity Coordinator at PHA. The coordinator is working with Australian, state and territory governments and the plantation sector, to establish partnership arrangements that will support a post-border National Forest Pest Surveillance Program 2021–26. The program aims to improve early detection of exotic forest pests and improve the chances of successful eradication before they significantly impact native forests, plantation forests and urban street trees.

Table 32. High Priority Pests of the plantation forestry industry

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

Figure 56. Annual value of plantation forestry production, 2007–19

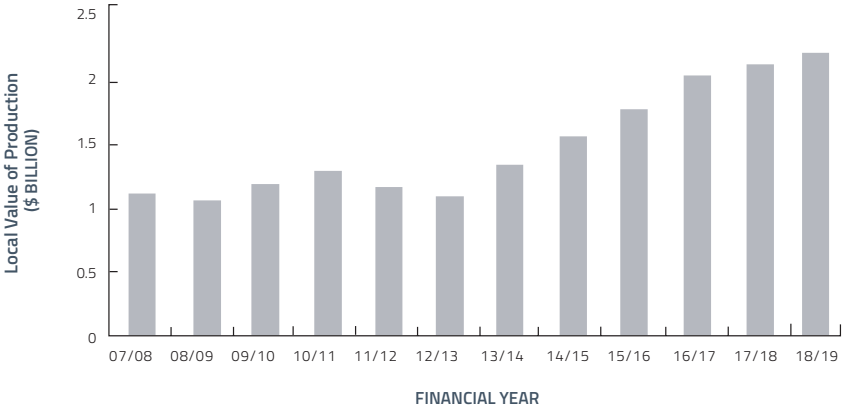
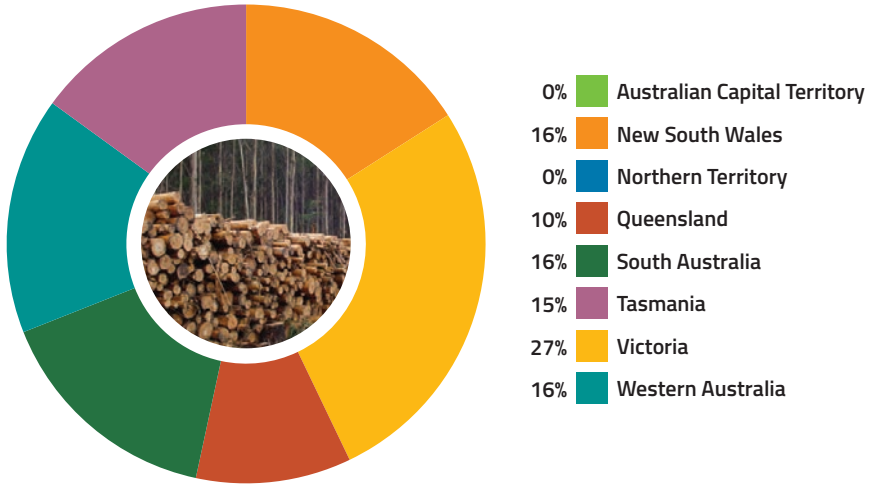


Figure 57. Distribution of plantation forestry production by state and territory, 2018–19 (based on LVP)



PROCESSING TOMATOES

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

In 2018–19, Australian processing tomato production was valued at approximately $23 million (LVP). A total of 210,477 tonnes of tomatoes were delivered to three processors, a slight decline from the previous year. Around 97 per cent of the 2,073 planted hectares were harvested, and the average yield of 105.1 tonnes per hectare was near the industry record despite wet weather during the harvest period.

Heinz varieties made up the bulk of crops grown in Australia. Most crops (86%) were transplanted, and 100 per cent of the production area was irrigated using sub-surface drip lines.

Australians consumed around 575,000 tonnes of processed tomatoes in 2019, 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, 2007–19

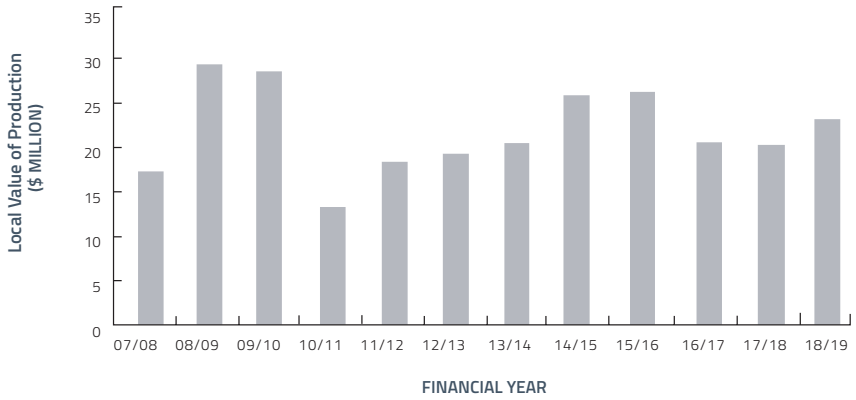


Table 33. High Priority Pests of the processing tomato industry

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

**established in Australia*

Figure 59. Distribution of processing tomato production by state and territory, 2018–19 (based on LVP)

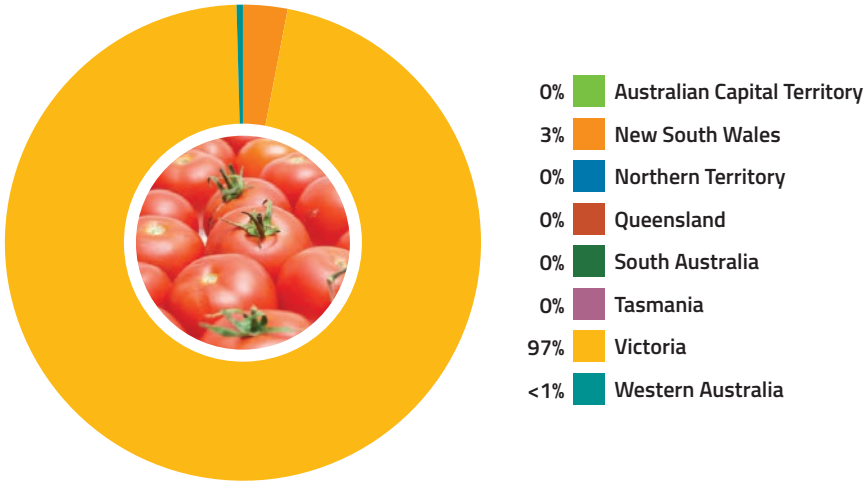


Image courtesy of the Australian Processing Tomato Research Council

PRODUCTION NURSERIES

Represented by Greenlife Industry Australia (GIA)
greenlifeindustry.com.au

The nursery industry operates in all states and territories of Australia, being one of the largest and most diverse plant industries in the country. The industry estimates an annual gross production value of approximately $0.9 billion (production nurseries only) will occur in 2021 across the entire supply chain. Greenlife production nurseries supply to ornamental retail, landscape, revegetation, rehabilitation and production horticulture sectors including tree crops (e.g. fruit, berries, 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. The industry has consistently guided RD&E levy investment towards plant protection and biosecurity resources both at a strategic national level as well as at a grower level.

In early 2018, Greenlife Industry Australia achieved certification and recognition of BioSecure HACCP as an Approved Biosecurity Scheme under the *Biosecurity Act 2014* (Queensland), the first such recognition of a third party certification program in Australia. This was followed by NSW providing equivalent certification under the *Biosecurity Act 2015* (NSW) 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 QLD, NSW, VIC, TAS, 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, 2007–19

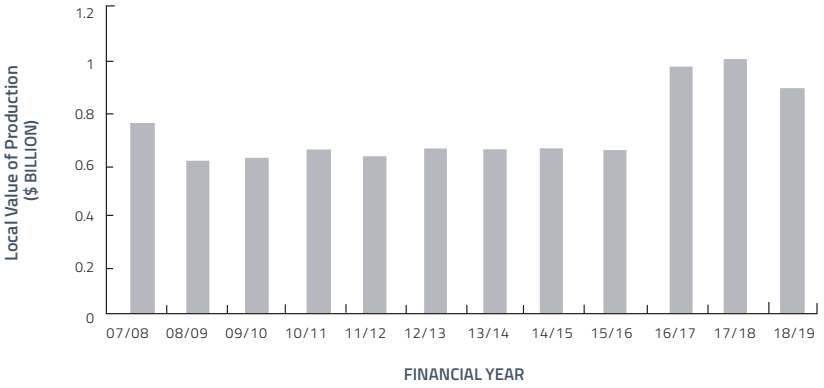


Figure 61. Distribution of production nurseries by state and territory, 2018–19 (based on LVP)

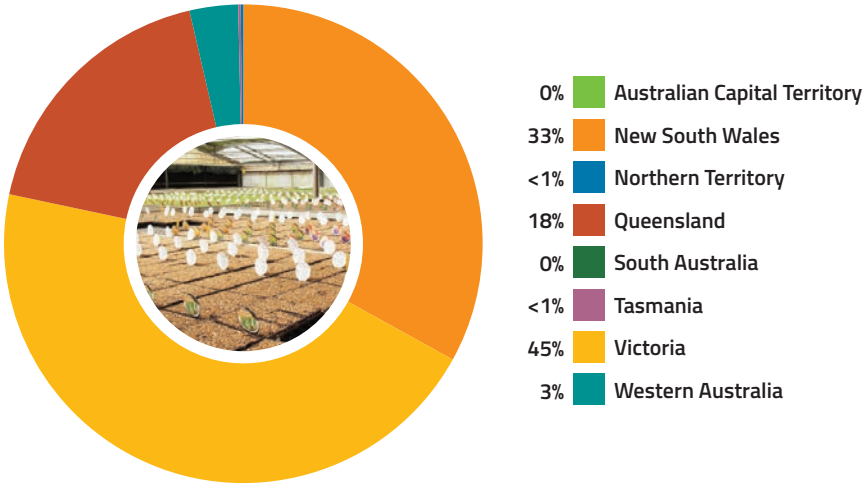


Table 34. High Priority Pests of the production nursery industry

Scientific name	Common name
Aphis gossypii (exotic strains)	Cotton aphid
Austropuccinia psidii sensu lato (exotic variants) (syn. *Puccinia psidii*)	Myrtle rust, guava rust, Eucalyptus rust
Bemisia tabaci (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
Candidatus Liberibacter asiaticus	Huanglongbing (Asiatic strain)
Diaphorina citri	Asian citrus psyllid
Echinothrips americanus	Poinsettia thrips
Homalodisca vitripennis (syn. *Homalodisca coagulata*)	Glassy winged sharpshooter
Lettuce infectious yellows virus (Crinivirus) and other exotic whitefly transmitted viruses	Lettuce infectious yellows virus
Liriomyza huidobrensis	Serpentine leaf miner
Lissachatina fulica (syn. *Achatina fulica*)	Giant African snail
Lygus lineolaris	Tarnished plant bug
Lymantria dispar	Asian gypsy moth
Oligonychus ilicis	Southern red mite
Phytophthora ramorum	Sudden oak death
Pomacea canaliculata	Golden apple snail
Pseudomonas syringae pv. *syringae* (exotic races)	Bacterial canker
Xylella fastidiosa (subspecies not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach, plum leaf scald

RICE

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

In 2018–19, rice production was valued at $31 million (LVP) with exports valued at $299 million.[39]

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 QLD and NT. In the 2019 season in NSW, 96 farms produced a total of 54,000 paddy tonnes of rice and in the 2020 season, 99 farms produced 45,000 paddy tonnes, the latter being the second lowest crop in 70 years.

Rice production in Australia is highly variable, reflecting water availability and the prices of alternative crops. Rice is sown from October to December and harvested in March to May in southern NSW.

Most of the rice produced in Australia is medium grain rice, the majority of which is exported. Ninety one percent of the 2019 harvest in southern NSW was medium or short grain varieties.[40]

The rice industry continues to conduct research into suitable varieties and management techniques to maximise water efficiency and allow production in north QLD.
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 35. High Priority Pests of the rice industry

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

Figure 62. Annual value of rice production, 2007–19

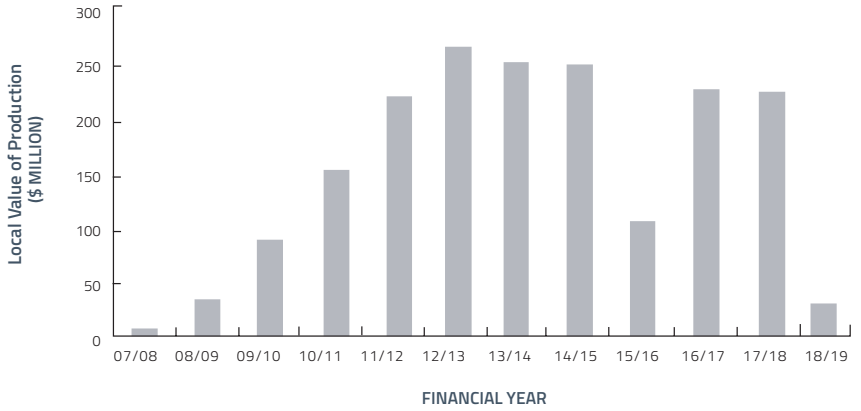
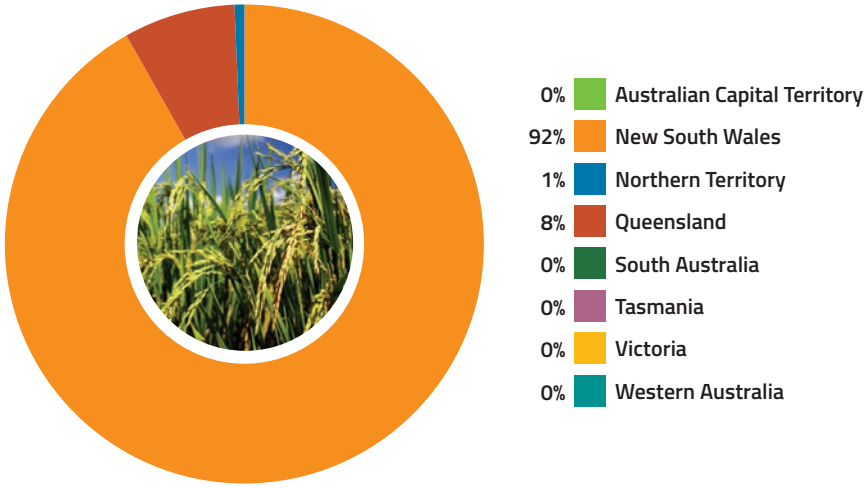


Figure 63. Distribution of rice production by state and territory, 2018–19 (based on LVP)



39 Australian Bureau of Agricultural and Resource Economics and Sciences. Agricultural commodities: March quarter 2021. Accessed 20 March 2021. agriculture.gov.au/abares/research-topics/agricultural-outlook/data#agricultural-commodities

40 Sunrice Annual Report 2019. Accessed online 20 March 2021. https://investors.sunrice.com.au/FormBuilder/_Resource/_module/2weQNICYSUy13FE_jxQXvg/file/annual-reports/Annual_Report_2019.pdf

RUBUS

Represented by Raspberries and Blackberries Australia (RABA)
berries.net.au/home/about/rubus/raba/

In 2018–19, the rubus industry was valued at $187 million (LVP), corresponding to production of 9,478 tonnes.

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, with approximately one per cent of production exported to Singapore, Hong Kong, India, Indonesia and Pacific Island countries. Fresh exports were valued at less than $100,000.

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.

Traditionally rubus is a cool temperate crop with peak production in early summer to autumn. However, year-round supply is possible from subtropical NSW and south-east QLD 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 production, 2009–19

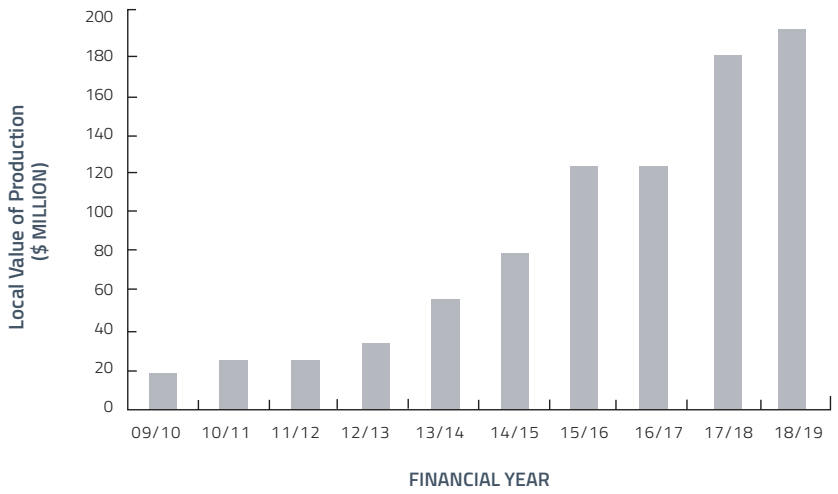
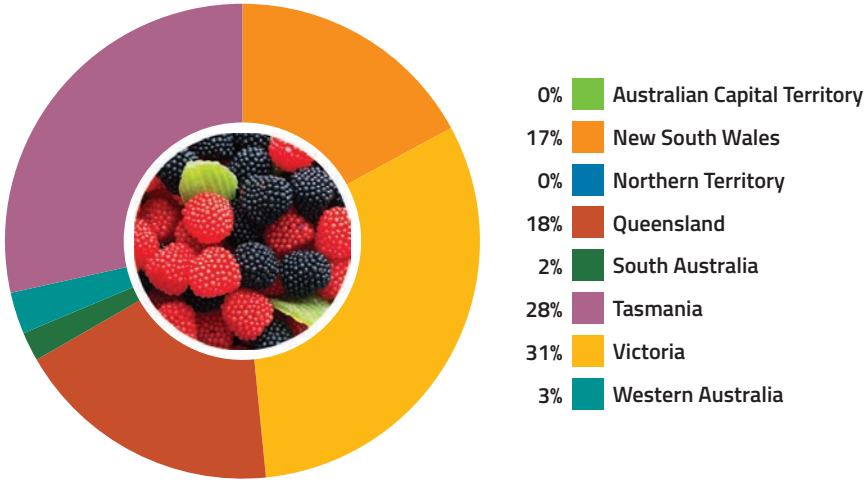


Table 36. High Priority Pests of the rubus industry

Scientific name	Common name
Arthuriomyces peckianus	Orange rust (long-cycled)
Cercosporella rubi	Rosette
Cherry leaf roll virus (Nepovirus) (exotic strains)	Blackline
Drosophila suzukii	Spotted wing drosophila
Euschistus conspersus	Consperse stink bug
Gymnoconia nitens	Orange rust (short-cycled)
Halyomorpha halys	Brown marmorated stink bug
Heterocrossa rubophaga (syn. *Carposina rubophaga, C. adreptella*)	Raspberry bud moth
Pennisetia hylaeiformis	Raspberry crown borer
Pennisetia marginata	Raspberry crown borer
Popillia japonica	Japanese beetle
Raspberry ringspot virus (Nepovirus)	Raspberry ringspot virus
Strawberry latent ringspot virus (Sadwavirus)	Strawberry latent ringspot virus
Tomato ringspot virus (Nepovirus)	Tomato ringspot virus, backberry mosaic virus, red currant mosaic virus

Figure 65. Distribution of rubus production by state and territory, 2018–19 (based on LVP)



STONE FRUIT

Represented by Summerfruit Australia
summerfruit.com.au

In 2018–19, stone fruit production (fresh apricots, nectarines, peaches and plums) was valued at $240 million (LVP), with exports valued at $89 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. VIC produces around 75 per cent of Australia's stone fruit (138,000 tonnes nationally) with the remaining production spread between NSW, QLD, SA, WA and TAS.

Increased stone fruit exports have been driven by demand from China. Market access to mainland China allowed an expansion of exports. During the 2018–19 export season, a record 23,013 tonnes were exported (an increase of 30%). While slightly down in 2019–20, Australia exported 21,300 tonnes of stone fruit worth $89.11 million, with 11,400 tonnes going to China and Hong Kong. Other major markets were United Arab Emirates, Saudi Arabia, Singapore and Malaysia.

In 2020, Summerfruit Australia was involved in several responses to pest incursions affecting the industry, including detections of brown marmorated stink bug, Varroa mite and exotic fruit fly. The industry had representation at PHA meetings and the relevant Australian Government Biosecurity Roundtables.

The Biosecurity Plan for the Summerfruit Industry (which also applies to the canned fruit industry) has been adopted, and components of the plan have been acted upon through 2020.

Table 37. High Priority Pests of the stone fruit industry

Scientific name	Common name
Anastrepha ludens	Mexican fruit fly
Anastrepha serpentina	Sapodilla fruit fly, sapote fruit fly
Anastrepha striata	Guava fruit fly
Bactrocera dorsalis (syn. *B. invadens, B. papayae, B. philippinensis*)	Oriental fruit fly
Drosophila suzukii	Spotted wing drosophila
Halyomorpha halys	Brown marmorated stink bug
Homalodisca vitripennis (with *Xylella fastidiosa*)	Glassy winged sharpshooter
Lymantria dispar	Asian gypsy moth
Philaenus spumarius (with *Xylella fastidiosa*)	Meadow froghopper, meadow spittle bug
Plum pox virus (Potyvirus)	Plum pox virus, sharka
Xylella fastidiosa (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, 2007–19

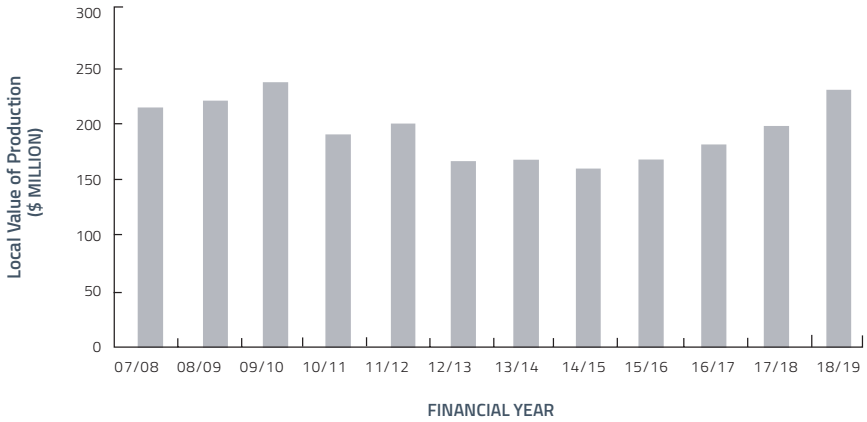
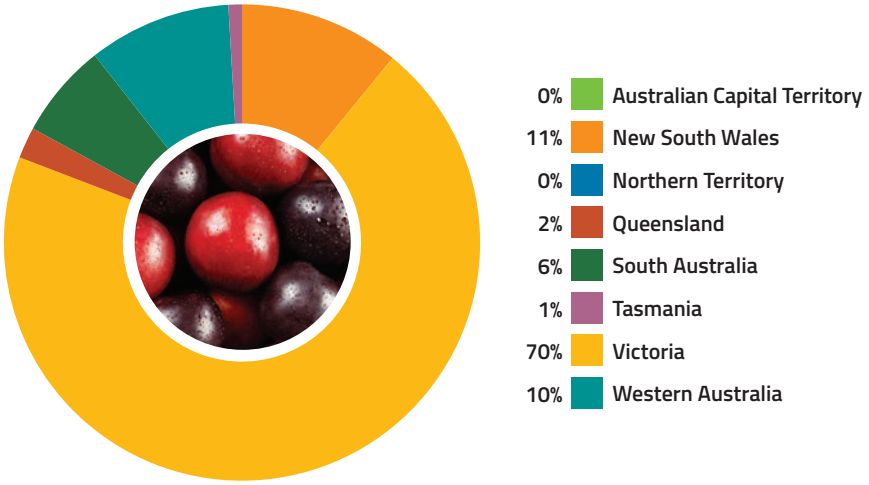


Figure 67. Distribution of stone fruit production by state and territory, 2018–19 (based upon LVP)



STRAWBERRIES

Represented by Strawberries Australia
berries.net.au/home/about/strawberries/sai

In 2018–19, strawberry production was valued at $323 million (LVP) with fresh exports valued at $24.4 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 2018–19 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 QLD, and the Yarra Valley and the Mornington Peninsula in VIC, with other production areas in Wannaroo, Bullsbrook and Albany in WA, the Adelaide Hills in SA, and TAS.

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 plantings of Australian-bred varieties are increasing, particularly in QLD.

Figure 68. Annual value of strawberry production, 2007–19

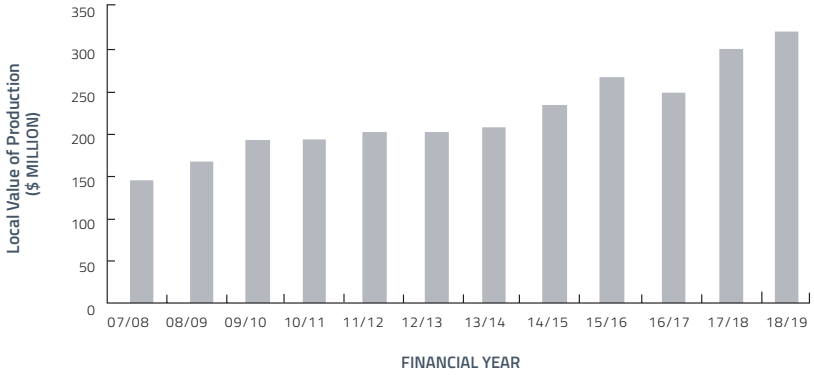


Figure 69. Distribution of strawberry production by state and territory, 2018–19 (based upon LVP)

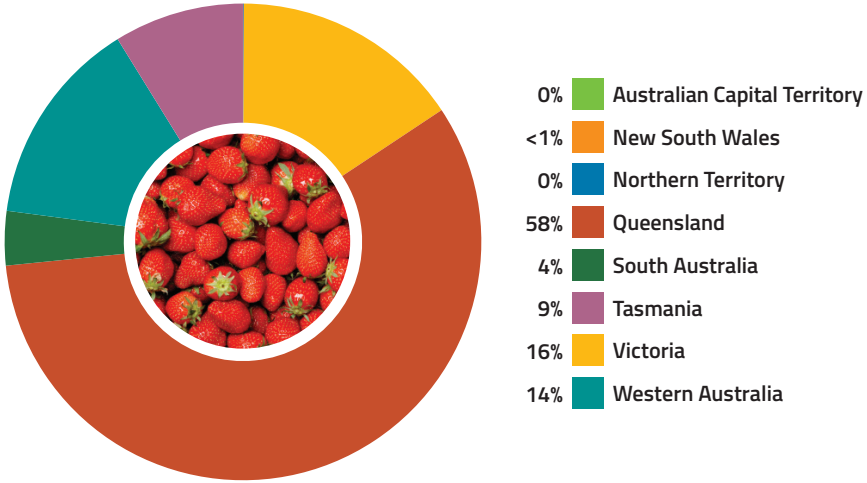


Table 38. High Priority Pests of the strawberry industry

Scientific name	Common name
Lygus hesperus	Western plant bug
Lygus lineolaris	Tarnished plant bug
Phytophthora fragariae var. *fragariae*	Red steele root rot
Raspberry ringspot virus (Nepovirus)	Raspberry ringspot virus
Tomato black ring virus (Nepovirus)	Tomato black ring virus
Tomato ringspot virus (Nepovirus)	Tomato ringspot virus, backberry mosaic virus, red currant mosaic virus
Xanthomonas fragariae	Strawberry angular leaf spot

SUGARCANE

Represented by CANEGROWERS
canegrowers.com.au

In 2018–19, sugarcane production was valued at $1.2 billion (LVP) with sugar exports valued at $1.53 billion.[41] In 2019, 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 QLD and Grafton in NSW. QLD 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.

41 Australian Bureau of Agricultural and Resource Economics and Sciences. Agricultural commodities: March quarter 2021. Accessed 20 March 2021. agriculture.gov.au/abares/research-topics/agricultural-outlook/data#agricultural-commodities

Figure 70. Annual value of sugarcane production, 2007–19

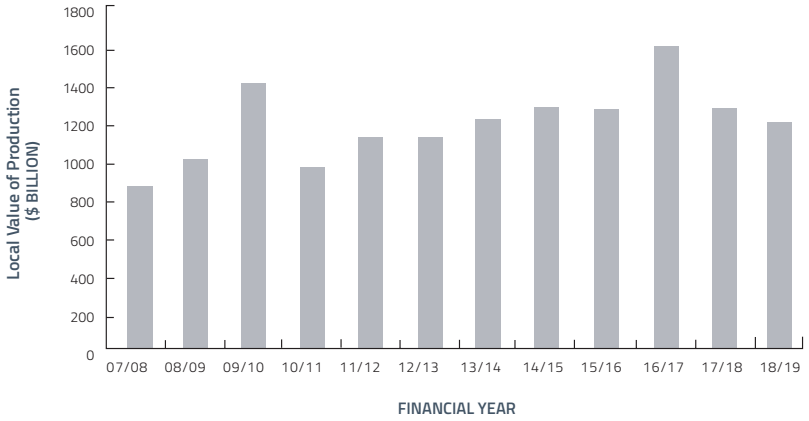


Figure 71. Distribution of sugarcane production by state and territory, 2018–19 (based upon LVP)

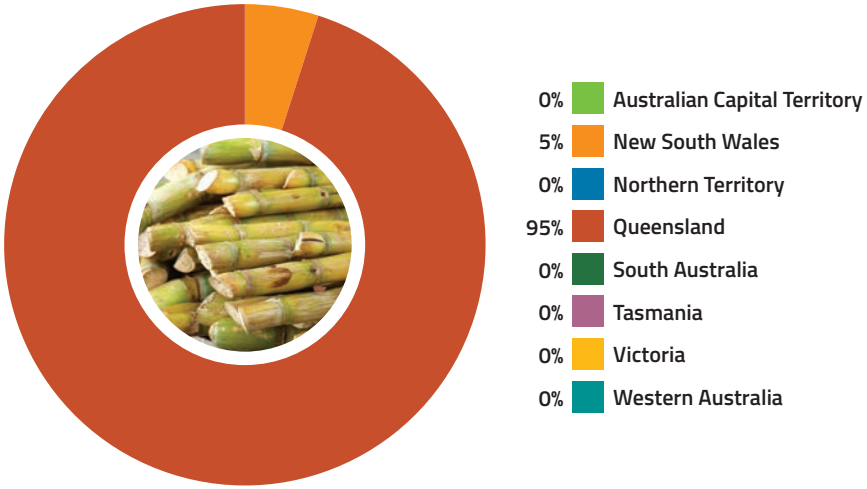


Table 39. High Priority Pests of the sugarcane industry

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

SWEETPOTATOES

Represented by Australian Sweetpotato Growers (ASPG)
aspg.com.au

In 2018–19, sweetpotato production was valued at $83 million (LVP), with exports valued at $2.4 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 100,000 tonnes. There are around 80 commercial producers with farm sizes ranging from 10 to 200 hectares, with most being 15 to 80 hectares. QLD 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 QLD; 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 2020, the sweetpotato industry updated and progressed its biosecurity plan with PHA. Key efforts included biosecurity training for members of the ASPG executive, and initial development of the Owner Reimbursement Costs Framework, for application during an incursion.

Figure 72. Annual value of sweetpotato production, 2011–19

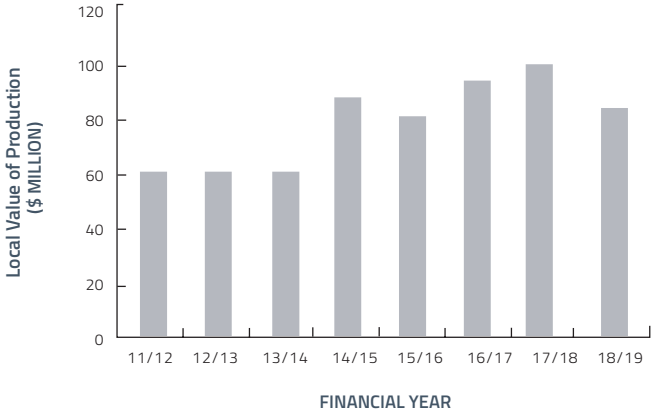


Table 40. High Priority Pests of the sweetpotato industry

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

**with sweet potato feathery mottle virus and sweet potato chlorotic stunt virus*

Figure 73. Distribution of sweetpotato production by state and territory, 2018–19 (based upon LVP)

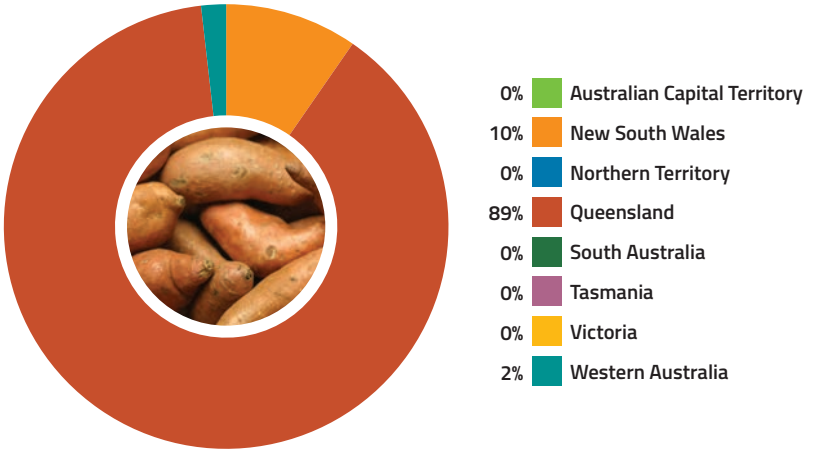


TABLE GRAPES

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

In 2018–19 table grape production was valued at $445 million (LVP), with 220,000 tonnes produced. Exports of 152,200 tonnes predominantly to China, Indonesia, Japan, Hong Kong and the Philippines were valued at $555 million.

In 2019–20, the table grape industry exported 152,200 tonnes, valued at $623 million, which was 12.2 per cent higher than the previous year. Green, red and blue-black varieties of table grapes are produced by approximately 900 growers in the major growing regions of Sunraysia and the Murray Valley in VIC; the Riverland in SA; Swan Valley, Carnarvon and Bunbury regions of WA; central QLD in Emerald, St George, Munduberra and Mareeba; and Ti Tree in the NT.

In the past three years there has been a significant expansion in the table grape sector, with 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 2020–21 season is forecast to see approximately 240,000 tonnes produced, with a 35:65 split between the domestic and export markets.

Figure 75. Distribution of table grape production by state and territory, 2018–19 (based upon LVP)

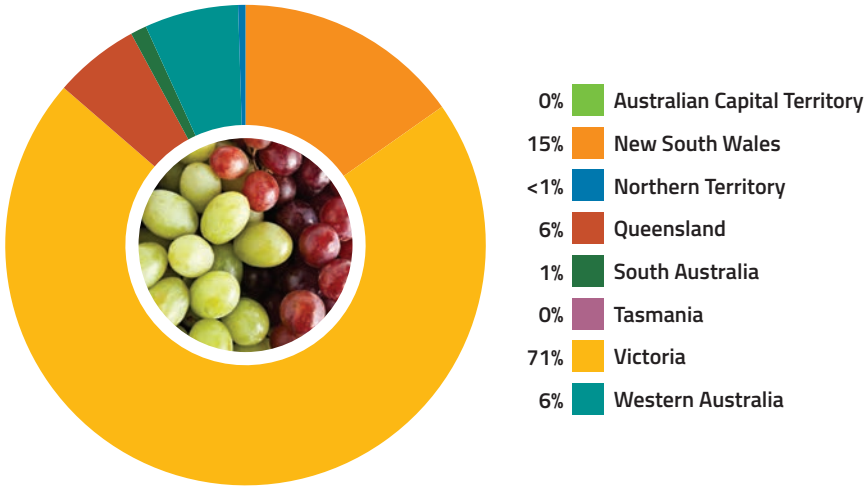
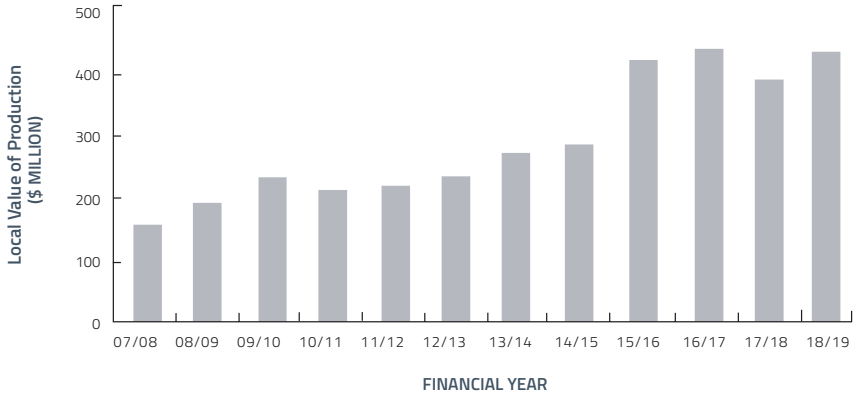


Table 41. High Priority Pests of the table grape industry

Scientific name	Common name
Argyrotaenia citrana	Orange tortrix
Bactrocera carambolae	Carambola fruit fly
Bactrocera dorsalis	Oriental fruit fly
Candidatus Phytoplasma solani	Bois noir
Ceratitis rosa	Natal fruit fly
Drosophila suzukii	Spotted wing drosophila
Grapevine red blotch-associated virus (Geminivirus) (with vector)	Grapevine red blotch associated virus, GRBaV
Guignardia bidwellii	Black rot
Halyomorpha halys	Brown marmorated stink bug
Homalodisca vitripennis (syn. *H. coagulata*)	Glassy winged sharpshooter
Homalodisca vitripennis (with *Xylella fastidiosa*)	Glassy winged sharpshooter
Lobesia botrana	European grapevine moth
Lycorma delicatula	Spotted lanternfly
Planococcus ficus	Vine mealybug
Polychrosis viteana	American berry moth
Pseudococcus comstocki	Comstock's mealybug
Pseudococcus maritimus	Grape mealybug
Tetranychus pacificus	Pacific spider mite
Xylella fastidiosa (subspecies not specified)	Pierce's disease

Figure 74. Annual value of table grape production, 2007–19



TEA TREE

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

In 2018–19, tea tree production was valued at $45 million (LVP), with the vast majority exported. This represents a significant (25%) drop in production due to frost, drought and fire events.

In 2020, there were about 140 tea tree growers in Australia and about 4,800 hectares under plantation production. Industry growth has stabilised, with an average annual production of 1,100 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 QLD.

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%) 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.

Figure 76. Annual value of tea tree production, 2013–19

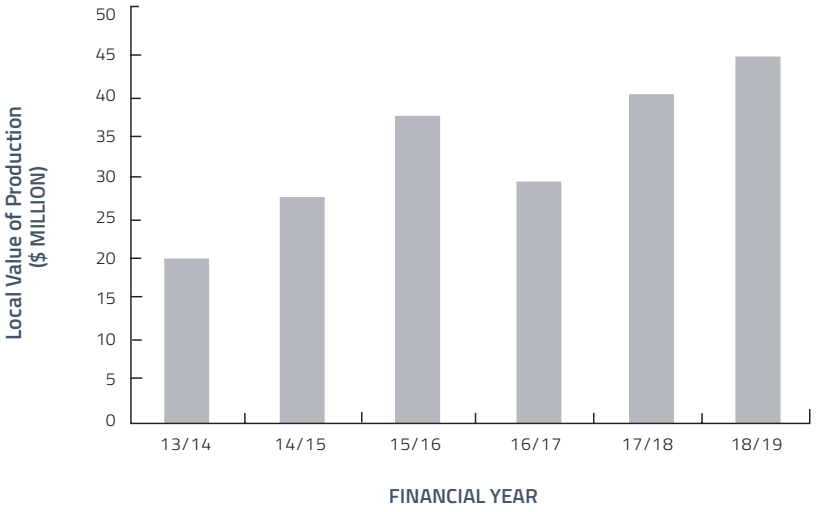


Figure 77. Distribution of tea tree production by state and territory, 2018–19 (based upon LVP)

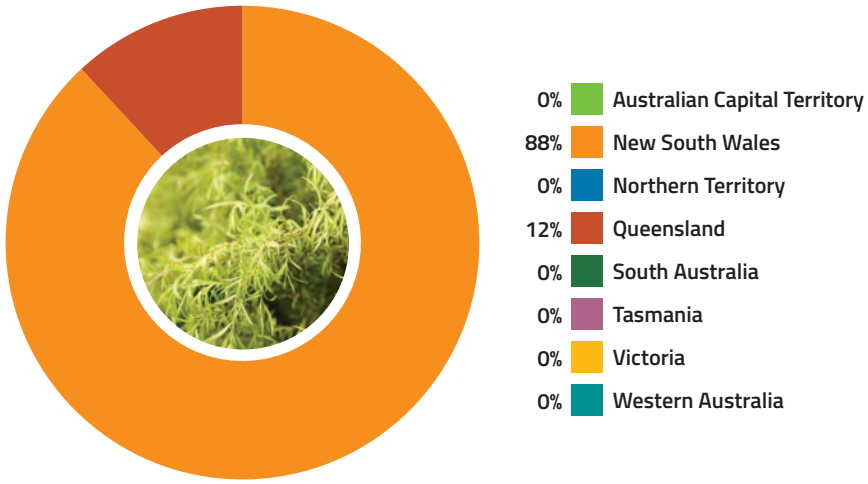


Table 42. High Priority Pests of the tea tree industry

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

TRUFFLES

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

In 2018–19, Australian truffle production was valued at $7 million (LVP), representing a significant reduction on the previous season.

Australian truffles are marketed in more than 40 different countries, with most of the harvest exported to Europe, the United States and Asia.

There is an estimated 450 to 500 truffle orchards, or truffières, around the country, 30 to 40 per cent of which 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 is the Manjimup region of WA, which accounts for around 75 per cent of the harvest. There is increasing production in TAS, ACT, NSW and VIC. A small number of newer farms in SA and southern QLD 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.*

The Australian truffle industry had a difficult 2020 season. The market supplying truffles for use in the home was buoyant, showing a significant increase on previous years, and there may be a flow-on effect next season. With many restaurants closed or only able to provide take home meals due to Covid-19, sales were down. However, in many locations there were reasonable sales made to this sector. The greatest impact was felt by the largest growers and exporters, as overseas markets were unpredictable, hard to access, and hard to get product to, due to transport limitations out of Australia.

Table 43. High Priority Pests of the truffle industry

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

Figure 78. Annual value of truffle production, 2012–19

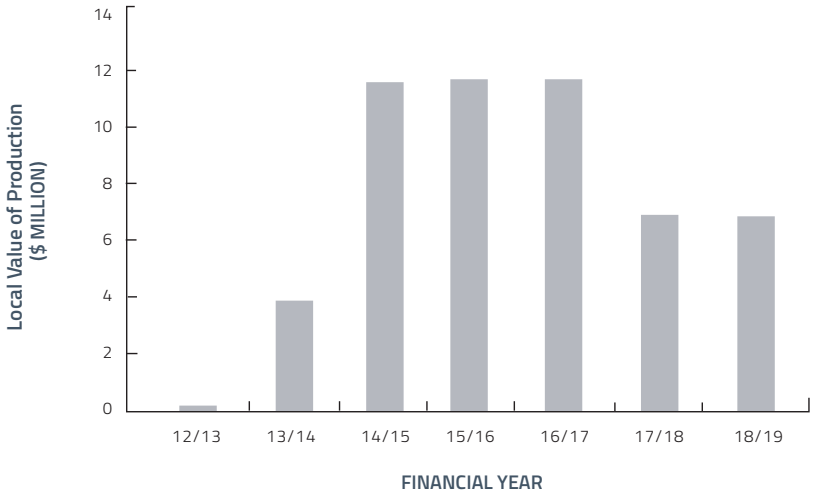
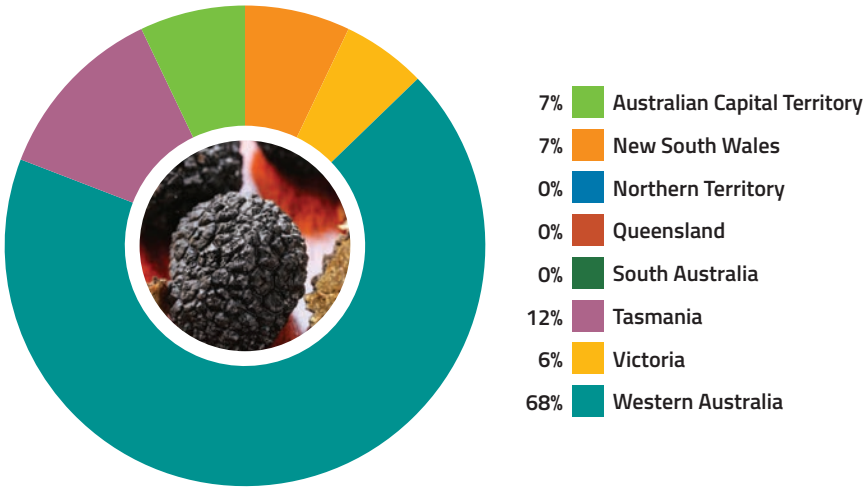


Figure 79. Distribution of truffle production by state and territory, 2018–19 (based on LVP)



VEGETABLES (INCLUDING POTATOES)

Represented by AUSVEG
ausveg.com.au

In 2018–19, vegetable and potato production was valued at $2.6 billion (LVP). Major crops include potatoes, carrots and lettuce. Potato production alone was valued at $659 million (LVP). Exports of vegetables, including potatoes, were valued at $292 million.

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

The Australian vegetable industry is committed to building its capacity to respond to potential biosecurity threats. The employment of two full-time biosecurity officers, a tomato potato psyllid national coordinator and a potato pest surveillance officer allows the industry to participate in a range of biosecurity related initiatives.

In 2020, the biosecurity officers visited numerous growing regions in Australia including Bundaberg in QLD, Katherine and Darwin in NT, Southern Tablelands in NSW, and the Lockyer Valley in QLD. They held a series of regional biosecurity awareness seminars in these regions and visited 18 individual farms. Due to Covid-19, further farm visits were not possible after mid-March. Instead, the officers conducted extensive grower consultation and interview sessions by telephone and Zoom. They also ran more than 10 biosecurity webinars and developed several videos and podcasts. Recordings of these are available at **ausveg.com.au**

The biosecurity officers also participated in technical committee, consultation and project development meetings with the DAWE, and engaged with state government departments, other industry bodies and PHA. They also facilitated a Melbourne-based pilot program that focused on exotic plant pest awareness in urban environments. Officers engaged with community gardeners and urban farmers, raising awareness of exotic plant pests and reporting protocols.

In 2020, the National Potato Biosecurity Surveillance Strategy was finalised, which involved significant engagement with potato growers, processors, seed suppliers and certifiers, industry bodies, the Australian Government and governments in WA, NSW, SA, TAS, VIC and QLD.

Figure 80. Annual value of vegetable production (excluding potatoes), 2007–19

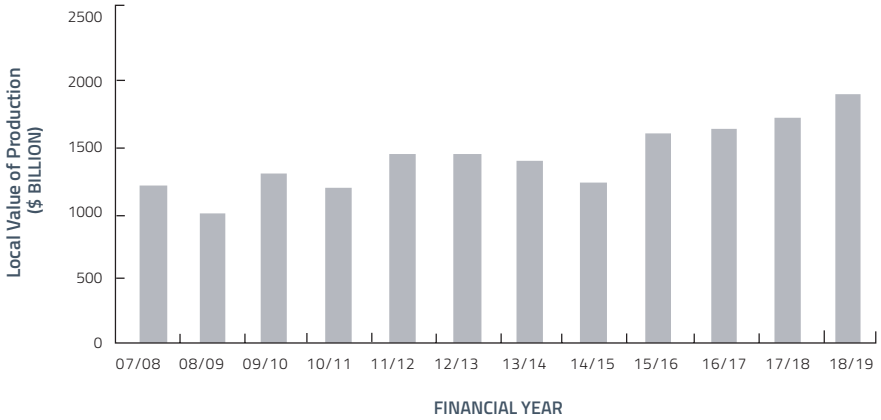


Figure 81. Distribution of vegetable production (excluding potatoes) by state and territory, 2018–19 (based upon LVP)

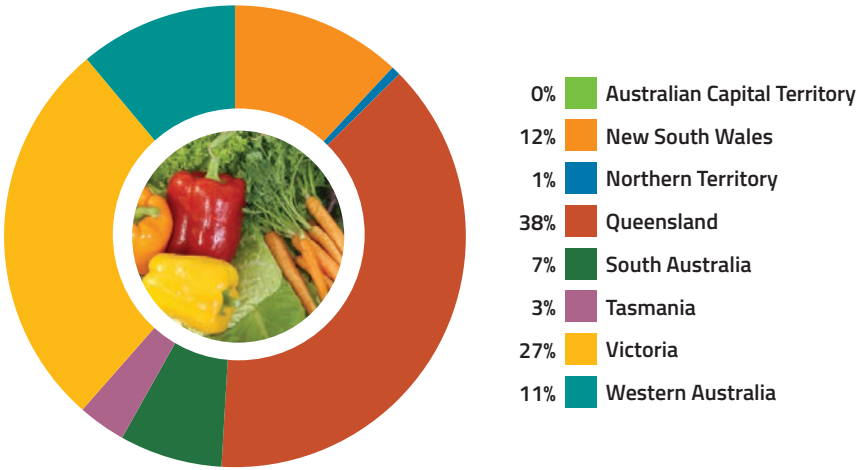


Table 44. High Priority Pests of the vegetable industry (excluding potatoes)

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

**established in Australia*

Figure 82. Annual value of potato production, 2007–19

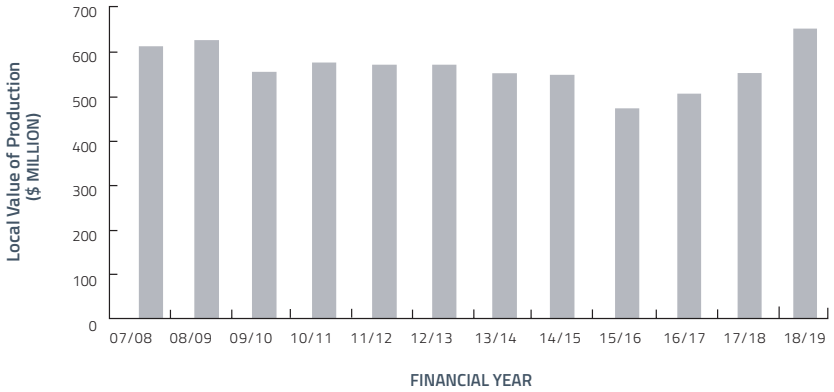


Figure 83. Distribution of potato production by state and territory, 2018–19 (based on LVP)

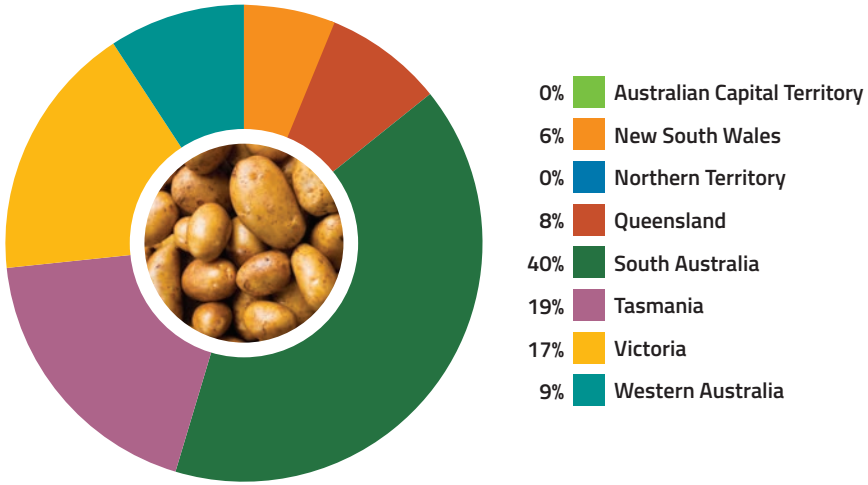


Table 45. High Priority Pests of the potato industry

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

WALNUTS

Represented by the Australian Walnut Industry Association
walnut.net.au

In 2018–19, the walnut industry was valued at $44 million (LVP), with exports valued at $17.9 million. In-shell production of 12,800 tonnes was produced from over 4,000 hectares or 1.2 million trees.

About 45 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 TAS; the Goulburn Valley near Shepparton; the Murray Irrigation Area near Kerang and Swan Hill in VIC; 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 Strategic Blueprint 2030 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 2020, the Australian Walnut Industry Association participated in responses to pest incursions, and funded projects to establish an Emergency Plant Pest Response (EPPR) levy and an Owner Reimbursement Cost Framework for the walnut industry, available on the association and PHA websites. Consultation was undertaken on the EPPR levy and the industry is working through the requirements, with the aim of the levy being legislated in 2021.

Table 46. High Priority Pests of the walnut industry

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

Figure 84. Annual value of walnut production, 2007–19

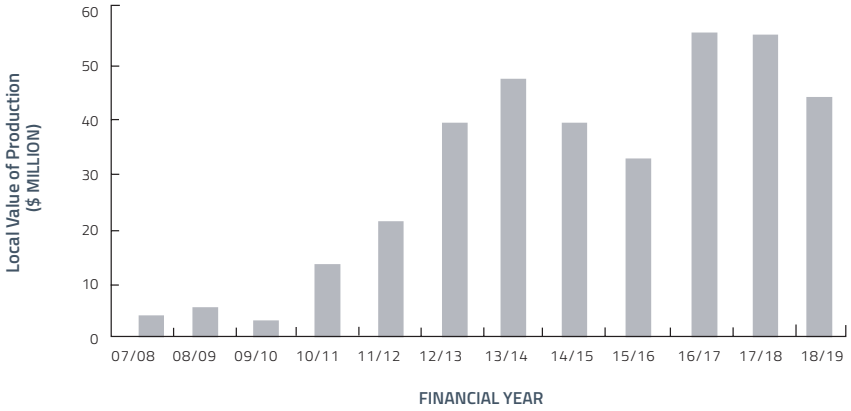
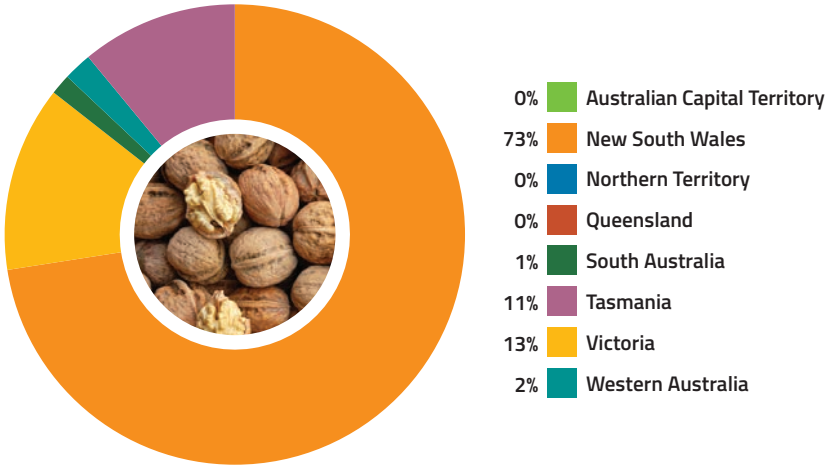


Figure 85. Distribution of walnut production by state and territory, 2018–19 (based on LVP)



WINE GRAPES

Represented by Australian Grape and Wine (AGW)
agw.org.au

In 2018–19, the Australian wine grape industry was valued at $961 million (LVP). The value of Australian wine exports was $2.95 billion.

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.

AGW promotes biosecurity within the sector and the viticulture industry more broadly. Its Wine Biosecurity Committee provides a mechanism to coordinate and prioritise biosecurity work across the wine sector and to promote leadership. AGW has worked to improve the sector's capacity to respond to a pest or disease incursion through emergency response planning and training for industry personnel Australia-wide.

In 2019 Hort Innovation and Wine Australia jointly funded the national Xylella preparedness initiative, funding a coordinator to manage cross-sectoral preparedness, act in a liaison role for potentially affected sectors, and ensure there is national awareness and coordination of high-priority RD&E to develop diagnostic tools, technologies, and protocols to screen plant material entering the country and to support active surveillance programs.

Figure 86. Annual value of wine grape production, 2007–19

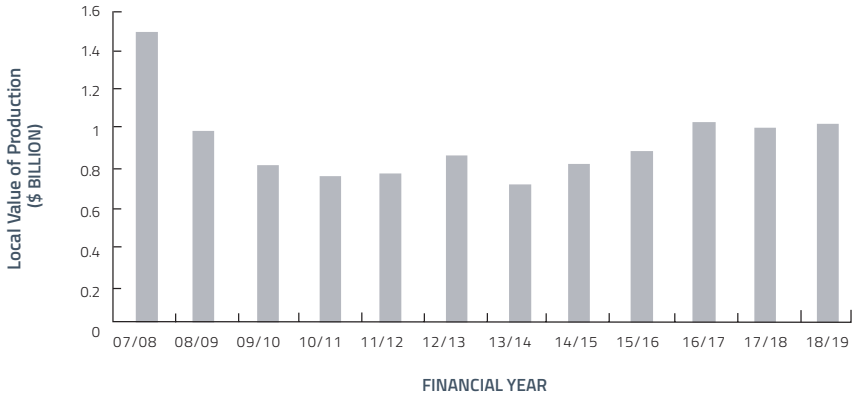


Table 47. High Priority Pests of the wine grape industry

Scientific name	Common name
Argyrotaenia citrana	Orange tortrix
Candidatus Phytoplasma solani	Bois noir
Daktulosphaira vitifoliae (exotic strains)	Grapevine phylloxera
Drosophila suzukii	Spotted wing drosophila
Grapevine red blotch-associated virus (Geminivirus) (with vector)	Grapevine red blotch associated virus, GRBaV
Guignardia bidwellii	Black rot
Homalodisca vitripennis	Glassy winged sharpshooter
Lobesia botrana	European grapevine moth
Lycorma delicatula	Spotted lanternfly
Planococcus ficus	Vine mealybug
Polychrosis viteana	American berry moth
Pseudococcus comstocki	Comstock's mealybug
Pseudococcus maritimus	Grape mealybug
Tetranychus pacificus	Pacific spider mite
Xylella fastidiosa (subspecies 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, 2018–19 (based on LVP)