

# The National Plant Biosecurity **Status Report**

2019

# Contents

<b>Foreword</b>	<b>7</b>		
<b>INTRODUCTION</b>	<b>9</b>		
<b>Australia's plant resources</b>	<b>10</b>		
<b>Features of 2019</b>	<b>12</b>		
<b>Growing threats of plant health</b>	<b>13</b>		
<b>Plant biosecurity highlights in 2019</b>	<b>14</b>		
<b>CHAPTER 1: AUSTRALIA'S PLANT BIOSECURITY SYSTEM</b>	<b>17</b>		
<b>Australia's plant biosecurity system</b>	<b>18</b>		
<b>Plant biosecurity framework and legislation</b>	<b>20</b>		
The Intergovernmental Agreement on Biosecurity	20		
The National Plant Biosecurity Strategy	20		
National committees	21		
Biosecurity legislation	23		
Biosecurity emergency response agreements	23		
Plant biosecurity statutory levies	24		
<b>Government roles</b>	<b>24</b>		
The Australian Government	24		
State and territory governments	28		
<b>Non-government roles</b>	<b>34</b>		
Plant Health Australia	34		
Peak plant industry bodies	36		
Private sector	36		
Research funders and providers	37		
The community	37		
<b>CHAPTER 2: PROTECTING AUSTRALIA'S PLANT RESOURCES</b>	<b>39</b>		
<b>Protecting Australia's plant resources</b>	<b>40</b>		
<b>National priority pests</b>	<b>41</b>		
National Priority Plant Pests	41		
National action plans	43		
National Priority List of Exotic Environmental Pests, Weeds and Diseases	44		
<b>Plant industry biosecurity preparedness</b>	<b>45</b>		
Biosecurity planning for plant industries	45		
Contingency planning	56		
<b>Environmental biosecurity preparedness</b>	<b>57</b>		
<b>CHAPTER 3: PLANT INDUSTRY PROFILES</b>	<b>65</b>		
Almonds	68		
Apples and pears	70		
Avocados	72		
Bananas	74		
Blueberries	76		
Canned fruits	77		
Cherries	78		
Chestnuts	79		
Citrus	80		
Cotton		82	
Dried fruits (grapes)		83	
Forestry		84	
Ginger		86	
Grains		88	
Hazelnuts		90	
Honey bees		92	
Lychees		94	
Macadamias		95	
Mangoes		96	
Melons		98	
Olives		99	
Onions		100	
Passionfruit		101	
Pineapples		102	
Pistachios		103	
Processing tomatoes		104	
Production nurseries		106	
Rice		108	
Rubus		109	
Stone fruit		110	
Strawberries		111	
Sugarcane		112	
Sweetpotatoes		114	
Table grapes		115	
Tea tree		116	
Truffles		117	
Vegetables (including potatoes)		118	
Walnuts		122	
Wine grapes		123	
<b>CHAPTER 4: PRE-BORDER AND BORDER BIOSECURITY</b>	<b>125</b>		
<b>Pre-border and border biosecurity</b>	<b>126</b>		
<b>Pre-border biosecurity</b>	<b>127</b>		
Obligations under international trade agreements	127		
Pre-border activities to mitigate the risks from imports	129		
Regulating imports to manage risk	130		
Other international activities	134		
Ensuring Australian exports meet required standards	135		
<b>Border biosecurity</b>	<b>143</b>		
Collaborations to reduce border biosecurity risks	143		
Government screening and inspection	144		
National border surveillance program	146		
Protecting our northern coastline	146		
Post-entry plant quarantine	147		

## CHAPTER 5: PLANT PEST SURVEILLANCE AND DIAGNOSTICS

<b>Post border biosecurity – plant pest surveillance and diagnostics</b>	<b>150</b>
<b>Plant pest surveillance</b>	<b>151</b>
Oversight of plant pest surveillance	151
Government surveillance programs	153
Industry surveillance strategies and programs	154
General surveillance programs	156
Plant pest surveillance programs in 2019	158
<b>Diagnostics – identifying plant pests and diseases</b>	<b>166</b>
Oversight of national plant biosecurity diagnostics	166
National Diagnostic protocols	168
Diagnostic services in Australia	172
National reference collections	172
Handbook for the Identification of Fruit Flies	178
Online systems supporting plant biosecurity	179
AUSPestCheck	179

## CHAPTER 6: POST-BORDER BIOSECURITY – ERADICATING NEW PLANT PESTS

<b>Post-border biosecurity – managing plant biosecurity emergencies</b>	<b>182</b>
<b>National plant biosecurity response arrangements</b>	<b>183</b>
Emergency Plant Pest Response Deed	183
PLANTPLAN	184
National Environmental Biosecurity Response Agreement	184
<b>Preparing for plant biosecurity incidents</b>	<b>185</b>
Reporting a plant pest or disease	185
Biosecurity Incident Management System	185
National Biosecurity Response Team	186
National communication arrangements	186
Training in biosecurity emergency responses	187
<b>Notifications and responses in 2019</b>	<b>189</b>
National response plans	189
Other plant pest notifications	189

## CHAPTER 7: POST-BORDER BIOSECURITY – CONTROLLING PESTS AND WEEDS

<b>Post-border biosecurity – controlling plant pests and weeds</b>	<b>196</b>
<b>Domestic quarantine</b>	<b>197</b>
Subcommittee on Domestic Quarantine and Market Access	197
Restrictions on interstate travellers carrying produce	197
<b>Restrictions on interstate movement of commercial consignments</b>	<b>198</b>
Official control of quarantine plant pests to protect overseas trade	199
Australia's regionalised pests	199
Preventing the spread of fruit flies	203

<b>Community involvement in domestic quarantine</b>	<b>204</b>
The biosecurity obligations of all Australians	204
The role of local government	204
<b>On-farm biosecurity</b>	<b>205</b>
Biosecurity extension and engagement programs	206
Biosecurity manuals for producers	209
Managing pests on farm	210
<b>Australia's weed biosecurity system</b>	<b>211</b>
Coordination of weed management	212
Preventing the entry of new weeds	212
Weed surveillance	213
Eradication and containment of weeds	214
Managing established weeds	214

## CHAPTER 8: PLANT BIOSECURITY RD&E

<b>Plant biosecurity research, development and extension</b>	<b>218</b>
<b>National Plant Biosecurity RD&amp;E Strategy</b>	<b>219</b>
<b>Australian Government agencies and statutory authorities</b>	<b>219</b>
Australian Centre for International Agricultural Research	219
Australian Research Council	220
Commonwealth Scientific and Industrial Research Organisation	220
Plant Innovation Centre @ Post-entry Quarantine (pic@peq)	220
Research and development corporations	222
Agrifutures Australia	222
Cotton Research and Development Corporation	223
Forest and Wood Products Australia	223
Grains Research and Development Corporation	223
Hort Innovation	224
Sugar Research Australia	224
Wine Australia	225
The Plant Biosecurity Research Initiative	225
<b>State and territory governments</b>	<b>226</b>
<b>University and private research institutes</b>	<b>226</b>
Collaborative research arrangements	226
Centre for Crop and Disease Management	227
Centre for Fruit Fly Biosecurity Innovation	228
Centre of Excellence for Biosecurity Risk Analysis	228
Australian Plant Biosecurity Science Foundation	228
Cooperative Research Centre for Honey Bee Products	228
<b>Plant biosecurity RD&amp;E projects in 2019</b>	<b>230</b>

## APPENDICES

<b>Organisation contact details</b>	<b>266</b>
<b>Glossary</b>	<b>268</b>
<b>Acronyms</b>	<b>270</b>

## INDEX

273

## Figures

<b>Figure 1.</b>	Australia's varied climatic zones	10
<b>Figure 2.</b>	Gross value of plant and animal production industries in Australia, 1972-2019	11
<b>Figure 3.</b>	2019 annual rainfall compared to historical rainfall observations	12
<b>Figure 4.</b>	2019 annual mean temperatures compared to historical temperature observations	12
<b>Figure 5.</b>	Key components of Australia's plant biosecurity system	19
<b>Figure 6.</b>	National government biosecurity committees and working groups with a plant focus	22
<b>Figure 7</b>	Comparative value of Australia's plant production industries, based on gross value of production, 2017–18	67
<b>Figure 8–87.</b>	Industry production data	69
<b>Figure 88.</b>	Entity responsibility for biosecurity risks, first points of entry (ports)	144
<b>Figure 89.</b>	Biosecurity risk pathways regulated by NAQS	146
<b>Figure 90.</b>	National Plant Biosecurity Surveillance System framework	152
<b>Figure 91.</b>	Surveillance programs by target host	158
<b>Figure 92.</b>	Surveillance programs by target pest type	158
<b>Figure 93.</b>	National Diagnostic Protocol endorsement process	168
<b>Figure 94.</b>	RD&E projects by pest type	230
<b>Figure 95.</b>	RD&E projects by research type or location	230
<b>Figure 96.</b>	RD&E projects by project value	230
<b>Figure 97.</b>	RD&E projects by biosecurity areas	231
<b>Figure 98.</b>	RD&E projects by crop type	231

## Tables

<b>Table 1.</b>	Plant and environmental biosecurity legislation across Australia	23
<b>Table 2.</b>	Plant Health Australia members	35
<b>Table 3.</b>	Australia's National Priority Plant Pests	41
<b>Table 4.</b>	The top 10 National Priority Plant Pests	42
<b>Table 5.</b>	Current biosecurity plans covering Australia's plant industries	45
<b>Table 6.</b>	High Priority Pest threats	46
<b>Table 7.</b>	Contingency plans	58
<b>Table 8–46</b>	Industry specific High Priority Pest lists	68
<b>Table 47.</b>	Australian Government import policy advice, final and in progress	131
<b>Table 48.</b>	Australia's export legislation, administered by the Department of Agriculture	135
<b>Table 49.</b>	Market access achievements for pollinator and plant product exports from Australia since 2000	138
<b>Table 50.</b>	Australia's post-entry plant quarantine facilities	147
<b>Table 51.</b>	Australia's plant biosecurity surveillance programs	158
<b>Table 52.</b>	National Diagnostic Protocols	169
<b>Table 53.</b>	Australia's diagnostic services, their capabilities, accreditations and collections	173
<b>Table 54.</b>	Responses to plant pests under EPPRD arrangements	190
<b>Table 55.</b>	Plant Pest detections notified under the EPPRD in 2019	192
<b>Table 56.</b>	Australia's regionalised pests	199
<b>Table 57.</b>	Biosecurity manuals for producers	209
<b>Table 58.</b>	Sales of plant chemicals in Australia, 2016–19	210
<b>Table 59.</b>	Plant biosecurity RD&E projects	232

## Case studies

<b>Introduction</b>	International Year of Plant Health	13
<b>Chapter 1</b>	Primary representatives and advisors for plant and environmental biosecurity	25
	National Biosecurity Statement	27
<b>Chapter 2</b>	National workshop prioritises action on Khapra beetle	43
	New program to prepare for <i>Xylella fastidiosa</i>	44
	Preparedness for vegetable leafminer	46
	Review of environmental risk management	56
<b>Chapter 4</b>	Regulating bulk grain imports to safeguard Australia's biosecurity status	134
	New measures to stop the arrival of unwanted pests with cut flower imports	136
	Visit by biosecurity partners from the Pacific	137
<b>Chapter 5</b>	Annual Surveillance Workshop 2019	152
	Citrus Surveillance and Pest Triage Workshop	153
	Forest pest surveillance in NSW	154
	Biosecurity Pathways and Surveillance Strategy Workshop	156
	Botanic Gardens Biosecurity Network	157
	Building skills through the Diagnostic Residential Program	166
Annual Diagnosticians' Workshop 2019	167	
<b>Chapter 6</b>	Exercise Crown and Anchor	185
	Exercise Blueprint for the cotton industry	187
	Workshop Sugar Rush tests industry's preparedness	188
	Banana freckle freedom declared	189
	Western Australia regains freedom from citrus canker	193
<b>Chapter 7</b>	Nursery industry biosecurity program pays off	198
	Regional fruit fly initiative recognised	205
	Strawberry grower awarded for on-farm biosecurity	208
	New Cherry Growers' Biosecurity Manual	209
	Increased support for weed biocontrol	213
	Multi-prong attack on hawkweed yields results	215
<b>Chapter 8</b>	Plant Biosecurity Research Initiative Symposium	225





## Foreword

2019 was a challenging year for agricultural industries in Australia. Extreme climatic events impacted production across the nation, with drought and bushfires causing devastation to crops and the natural environment.

Fortunately, our crops and native plants are largely protected from the consequences of pests that affect plants overseas by a highly effective biosecurity system. The system relies on the efforts of a wide variety of stakeholders, with governments, growers, scientists and community members working in a co-ordinated manner. This allows us to address the biosecurity challenges posed by globalisation, the increased movement of people and goods, and climate change.

By working together, we can effectively prevent, respond to, eradicate and recover from plant pest incursions, thereby maintaining the productivity and profitability of our plant industries.

Each year, the National Plant Biosecurity Status Report is published by Plant Health Australia. This 12th edition of the report provides a comprehensive overview of Australia's plant biosecurity system and the activities performed by all major stakeholders during the 2019 calendar year. It also describes over 680 plant and pollinator biosecurity research, development and extension projects. This research is fundamental to the development and adoption of new technologies which will significantly enhance our capability to detect and respond to exotic pests in the future.

Over 100 organisations provided data and images for this report. PHA thanks all of the contributors, whose cooperation make the publication of this edition of the National Plant Biosecurity Status Report possible.



Steve McCutcheon  
Chairman  
Plant Health Australia







# Introduction



## Australia's plant resources

Australia is fortunate to be free from many serious plant pests that exist overseas, due to more than a century of effective quarantine measures and our geographic isolation.

Our plant health status confers significant benefits to us all. Without biosecurity efforts, plant pests such as insects, fungi, bacteria and viruses spread to suitable host plants in new areas and countries aided by the movement of people and goods.

Due to the wide range of climatic zones in Australia (see Figure 1), there are many types of natural ecosystems and crop species grown. Each ecosystem and crop has a set of pests that pose a threat.

Almost half of Australia's total land area is used for agriculture. In the tropical and subtropical zones, crops such as bananas, sugarcane, pineapples, mangoes and ginger are grown. In southern temperate zones, pome and stone fruits, grapes, nuts, onions and potatoes can be cultivated. Vast areas with grassland climate are suited to broadacre production of grains, pulses, cotton, timber and pasture for livestock production, and vegetables are grown in many areas.

Plant industries make a significant contribution to agricultural production and exports. In 2017–18, around 378 million hectares was farmed by 85,000 crop and livestock businesses.<sup>1</sup> Plant industries represented a gross value of \$33 billion (Figure 2) and plant exports were worth more than \$27 billion, mainly grains (such as wheat, barley and canola), sugar, wine, forestry, cotton and horticultural products.

Produce destined for overseas must meet the standards set for market access, which often includes evidence that production areas are free from certain pests. Production and trade could be jeopardised by an incursion of a new pest that makes its way into our fields, orchards and plantations.

Protection of plants in the environment and those planted for social amenity from the risks and negative effects of pests, weeds and diseases entering, emerging, establishing or spreading in Australia, is also a high priority.

Figure 1. Australia's varied climatic zones

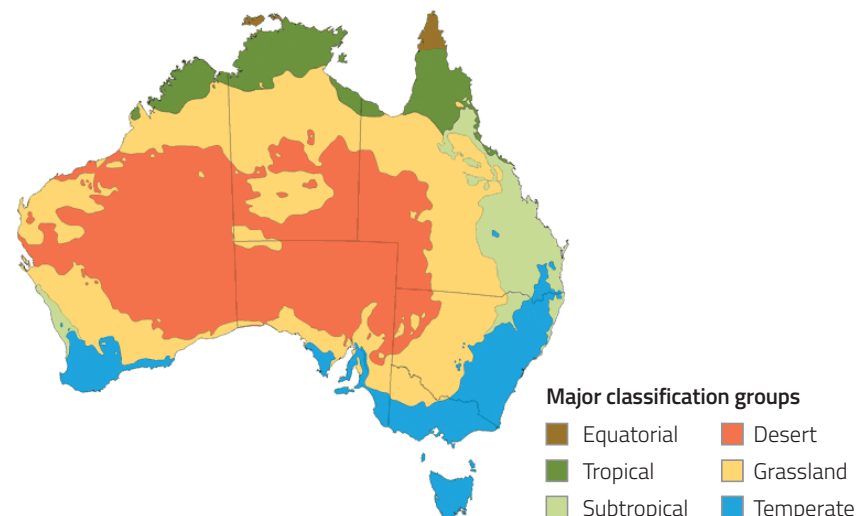


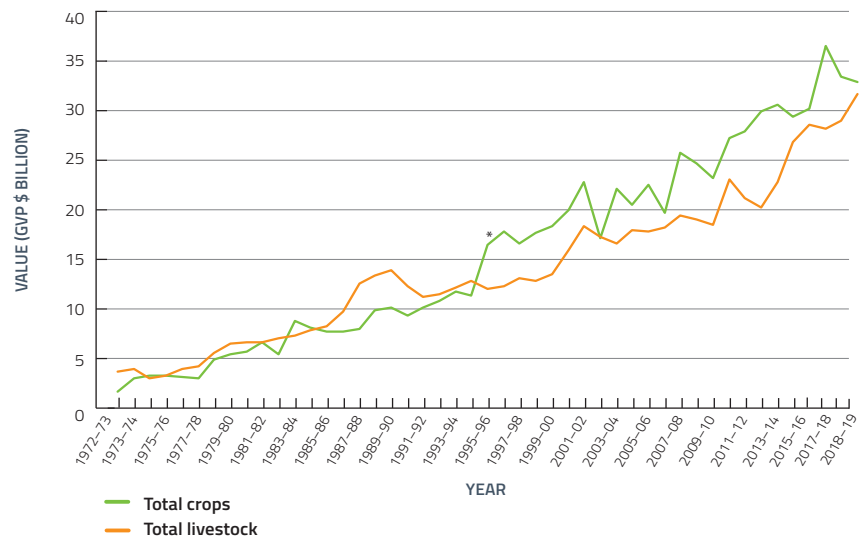
Image courtesy of the Bureau of Meteorology

We have a unique, biodiverse natural environment with more than 500 national parks covering more than 28 million hectares representing four per cent of the total land area. A further six per cent or more of Australia is protected and includes areas within state forests, nature reserves, indigenous protected areas and conservation reserves.<sup>2</sup> In 2017 the Australian Bureau of Statistics estimated these areas brought more than \$6 trillion worth of benefits to Australia. Invasive exotic plant pests and weeds could threaten native species, disrupt ecosystems and change the face of these landscapes, along with parklands and other public amenities.<sup>3</sup>

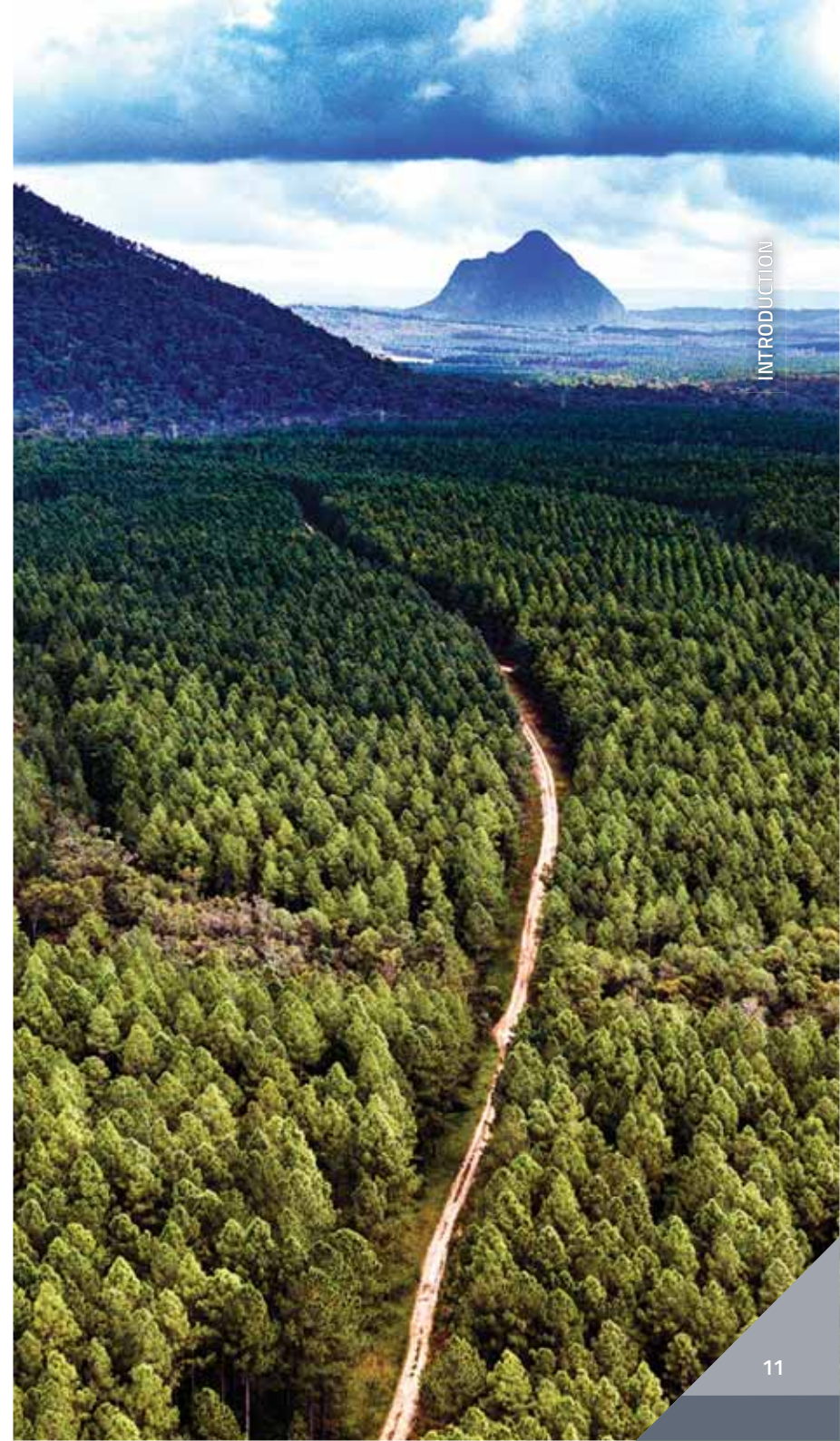
The definition of a pest used in this report covers insects, mites, snails, nematodes, pathogens (diseases) and weeds that have the potential to adversely affect food, fibre, ornamental crops, bees and stored products, as well as environmental flora and fauna. Exotic pests are those not currently present in Australia. Established or regionalised pests are those present within Australia.

1. Australian Bureau of Statistics. 7121.0 - Agricultural Commodities, Australia, 2017–18 – Statistics. Accessed online 3 March 2020 [www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/7121.02017-18?OpenDocument](http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/7121.02017-18?OpenDocument)
2. Commonwealth of Australia. Conserving Australia: Australia's National parks, conservation reserves and marine protected areas. Accessed online 11 February 2020 [aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Completed\\_inquiries/2004-07/nationalparks/report/index](http://aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Completed_inquiries/2004-07/nationalparks/report/index)
3. Australian Bureau of Statistics. Australian environmental–economics accounts, 2017, Cat. No. 4655.0. Accessed online 11 February 2020 [abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4655.0Main+Features12017](http://abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4655.0Main+Features12017)

Figure 2. Gross value of plant and animal production industries in Australia, 1972-2019\*



\* Includes forestry from 1995-96



## Features of 2019

2019 was a very challenging year for plants grown in Australia, whether they be for plant industries, in natural environments or in urban settings. While the year began with devastating flooding in the far north gulf country, the balance of the year for a large portion of the country was the driest on record, with nationally averaged rainfall 40 per cent below average for the year at 277.6 mm (Figure 3), and the warmest on record, with the annual national mean temperature 1.52 degrees above average (Figure 4).<sup>4</sup>

The drought had a great impact on the growth of dryland crops and pastures and the amount of water available for irrigated crops, limiting grazing resources for livestock. Crop pollinators too, like European honey bees, were hit by a lack of flowers on which to forage. Water allocation prices reflected both the scarcity of irrigation water and the changing willingness to pay as new higher-value industries enter the market, such as nut crops.

In December 2019, the Australian Bureau of Agricultural and Resource Economics and Sciences forecasted the total crop production in 2019–20 to be the lowest since 2007–08.<sup>5</sup> The value of agricultural exports was forecasted to fall by eight per cent to \$45 billion. The main drivers of this were lower crop and livestock production and a diversion of grain to the domestic market for feed and human consumption.

A key feature of 2019 was the widespread incidence of fires, with more than 100 fires impacting the south east of the country. Starting in September 2019, fires in most states of Australia had a devastating impact on coastal bushland areas and some agricultural enterprises, continuing into January 2020.

Figure 3. 2019 annual rainfall compared to historical rainfall observations

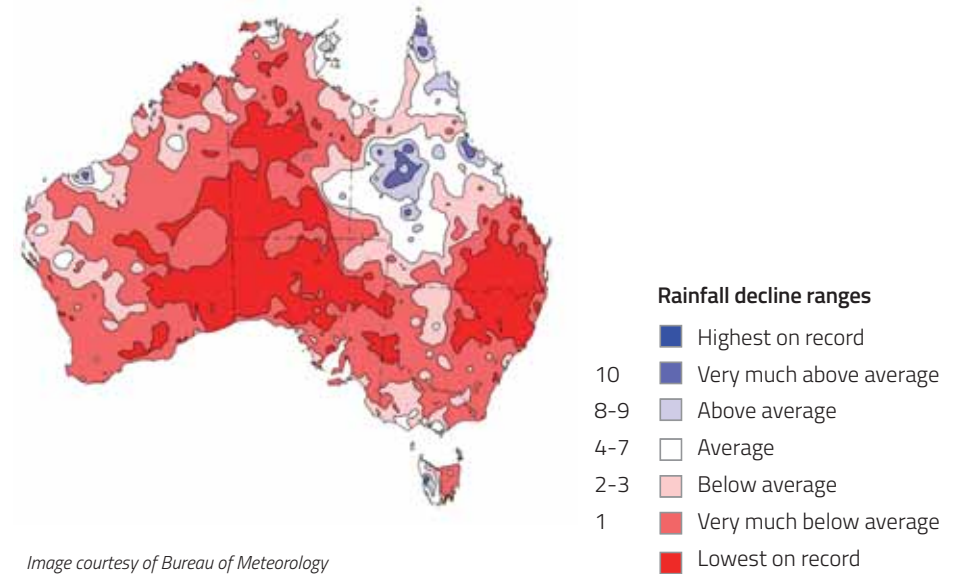
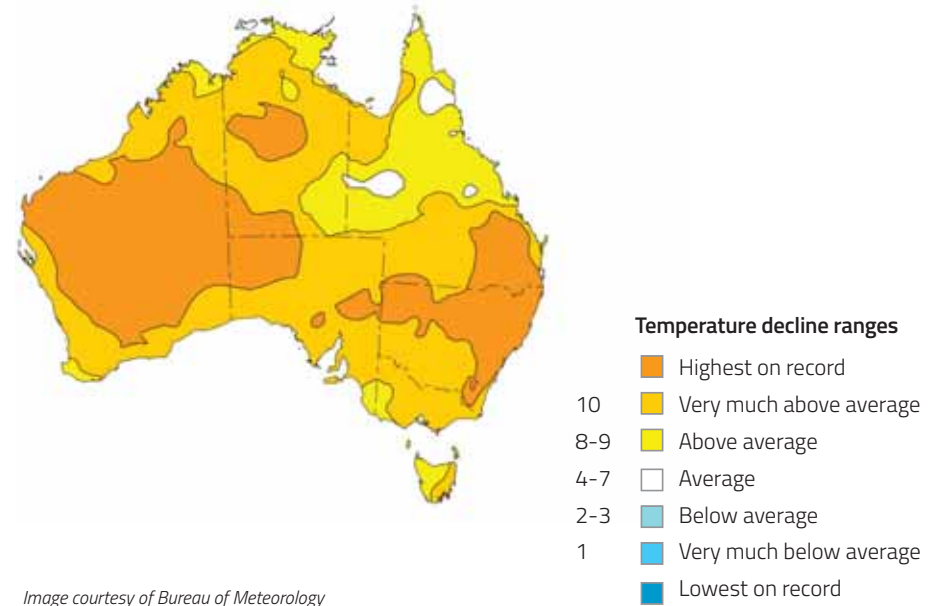


Figure 4. 2019 annual mean temperatures compared to historical temperature observations



4. Bureau of Meteorology. Australia's climate in 2019. Accessed online 24 February 2020 [www.bom.gov.au/climate/current/annual/au19/](http://www.bom.gov.au/climate/current/annual/au19/)

5. Australian Bureau of Agricultural and Research Economics and Sciences. Agricultural commodities December quarter 2019. Accessed online 16 March 2020 [www.agriculture.gov.au/abares/research-topics/agricultural-commodities/australian-crop-report](http://www.agriculture.gov.au/abares/research-topics/agricultural-commodities/australian-crop-report)

## Growing threats to plant health

Factors such as globalisation, international and interstate movement, climate change, tourism and the increasing volume of goods moved are all contributing to increasing biosecurity risks in Australia.<sup>6</sup>

Plant pests and diseases spread in three main ways:

- through trading goods and movement of people
- by environmental forces including water and wind
- carried by vectors such as insects.

The growth in trade and international movement of people presents biosecurity challenges for Australia. Annually there is now nearly 100 million tonnes of freight arriving by sea,<sup>7</sup> 1 million tonnes by air,<sup>8</sup> and 20.5 million international travellers arriving,<sup>9,10</sup> including 8.7 million foreigners.

To maintain Australia's favourable biosecurity status in this age of increased global trade and travel, a high priority is placed on plant biosecurity. During 2019, Australian biosecurity officers intercepted more than 290,000 items of biosecurity concern across the country, including approximately 40,000 items sniffed out by biosecurity detector dogs.<sup>11</sup>

Some 399 high priority pests have been identified for Australia's plant industries through biosecurity planning by Plant Health Australia (PHA). The high priority plant pests for the environment were identified and listed for the first time in 2019 (see Chapter 2). Just as important as keeping exotic pests out of Australia is the management of established or regionalised pests that are already present.

- 
6. Commonwealth of Australia. Priorities for Australia's Biosecurity System: Response from Australian agriculture ministers (November 2018). Accessed online 16 July 2019 [agriculture.gov.au/SiteCollectionDocuments/igab-review-response.pdf](http://agriculture.gov.au/SiteCollectionDocuments/igab-review-response.pdf)
  7. Department of Infrastructure, Transport, Cities and Regional Development. Australian Sea Freight 2016–17. Accessed online 11 February 2020 [www.bitre.gov.au/sites/default/files/documents/asf\\_2016\\_17.pdf](http://www.bitre.gov.au/sites/default/files/documents/asf_2016_17.pdf)
  8. Department of Infrastructure, Transport, Cities and Regional Development. Aviation Statistics. Accessed online 11 February 2020 [www.bitre.gov.au/statistics/aviation](http://www.bitre.gov.au/statistics/aviation)
  9. Australian Bureau of Statistics. Overseas Arrivals and Departures, Australia November 2019. Accessed online 11 February 2020 [www.abs.gov.au/ausstats/abs@.nsf/mf/3401.0](http://www.abs.gov.au/ausstats/abs@.nsf/mf/3401.0)
  10. Austrade. Latest International Visitor Survey Results, September 2019. Accessed online 11 February 2020 [www.tra.gov.au/International/international-tourism-results](http://www.tra.gov.au/International/international-tourism-results)
  11. Office of the National Data Commissioner. Biosecurity by numbers December 2019. Accessed online 11 February 2020 [www.datacommissioner.gov.au/media-hub/biosecurity-numbers](http://www.datacommissioner.gov.au/media-hub/biosecurity-numbers)

## International Year of Plant Health

The International Year of Plant Health for 2020 was launched globally by the Food and Agriculture Organization in Rome on 2 December 2019.

The theme for the year, 'Protecting plants, protecting life', underlines the need for everyone to understand and take seriously their role in protecting Australia's biosecurity.

The aim is to raise global awareness of how protecting plant health can help end hunger, reduce poverty, protect the environment, and boost economic development. The focus for Australia is on preventing the spread of pests and diseases because they have the greatest impact on crops, the environment and our way of life.

Australia's Chief Plant Protection Officer chairs a steering committee for the year in Australia, comprised of departmental staff and representatives from PHA, peak industry bodies and other key stakeholders.

Throughout the year many activities and events are being organised to recognise and champion the importance plant health all around the country. The website **[planthealthyear.org.au](http://planthealthyear.org.au)** was launched in late 2019 as a central hub of information for the celebration of the year in Australia.



## Plant biosecurity highlights in 2019

Below is a timeline of some key plant biosecurity related events during 2019 that involved a broad range of stakeholders across Australia working to protect our plant resources. These events are referenced throughout the report.

