



Australian Government

Grains Research and  
Development Corporation

# 2016–17 GRDC ANNUAL REPORT



[grdc.com.au](http://grdc.com.au)

# The GRDC

The **Grains Research and Development Corporation** is a corporate Commonwealth entity established to plan and invest in research, development and extension (RD&E) for the Australian grains industry.

Its primary objective is to drive the discovery, development and delivery of world-class innovation to enhance the productivity, profitability and sustainability of Australian grain growers and benefit the industry and the wider community.

Its primary business activity is the allocation and management of investment in grains RD&E.

## GRDC VISION

A profitable and sustainable Australian grains industry, valued by the wider community.

## GRDC MISSION

Create value by driving the discovery, development and delivery of world-class innovation in the Australian grains industry.

## GRDC VALUES

We are **committed** and **passionate** about the Australian grains industry.

We value **creativity** and **innovation**.

We build strong relationships and partnerships based on mutual **trust** and **respect**.

We act **ethically** and with **integrity**.

We are **transparent** and **accountable** to our stakeholders.

# Letter of transmittal



13 October 2017

The Hon Barnaby Joyce MP  
Deputy Prime Minister  
Minister for Agriculture and Water Resources  
Parliament House  
CANBERRA ACT 2600

Dear Minister

It is my pleasure to present the annual report of the Grains Research and Development Corporation (GRDC) for the year ended 30 June 2017, in accordance with section 46 of the *Public Governance, Performance and Accountability Act 2013* and section 28 of the *Primary Industries Research and Development Act 1989* (PIRD Act).

The GRDC is confident that its performance in 2016–17 contributed to the industry's and the government's vision for a profitable, sustainable and internationally competitive Australian grains industry.

This achievement is consistent with the GRDC's responsibility to plan, execute and report against the:

- objects of the PIRD Act as they apply to the GRDC
- planned outcomes of the Strategic R&D Plan 2012–17 and performance measures of the Annual Operational Plan 2016–17
- outcome and key performance indicators of the Agriculture and Water Resources Portfolio Budget Statements 2016–17
- core requirements of the Funding Agreement 2015–19.

The annual report was prepared under the direction of the Board and approved by a resolution of the corporation's directors on 28 September 2017.

Yours sincerely

A handwritten signature in black ink, appearing to read "John Woods".

**John Woods**  
Chair



# Highlights of 2016–17

» The GRDC invested \$198 million in 700 R&D projects.

» GRDC-supported breeding programs released two new, improved varieties: one oat and one desi chickpea.

» Pre-breeding screening methodologies were developed for fungal and bacterial diseases and root-lesion nematodes.

» Faba bean germplasm combining early maturity and chocolate spot resistance was developed.

» The GRDC committed to jointly fund the Future Farm Program with the Cotton Research and Development Corporation.

» The GRDC committed \$15 million to boost grains research infrastructure.

» Accelerating Precision Agriculture to Decision Agriculture (P2D), the first joint project involving all 15 Australian Government rural R&D corporations, was launched.





**99%** of growers have undertaken on-farm activities with a positive impact on the environment.



**87%** of growers have undertaken on-farm practices to maintain or enhance biosecurity.



**84%** of growers rate the GRDC's performance as an investor in grains research as fairly high to very high.



**76%** of growers are comfortable to extremely comfortable paying the levy.

## INCOME

**\$139m**

Grain grower  
levy

**\$73m**

Australian  
Government

**\$30m**

Interest, royalties  
and other

**\$198m**

Research and  
development

**\$19m**

Suppliers  
and other

**\$11m**

Employee  
benefits

## EXPENSES

## CROP LEVIES

**\$62m**

Wheat

**\$26m**

Coarse grains

**\$25m**

Grain  
legumes

**\$26m**

Oilseeds

## RD&E INVESTMENTS

**\$8m**

Meeting market  
requirements

**\$38m**

Improving crop  
yield

**\$54m**

Protecting your  
crop

**\$39m**

Advancing profitable  
farming systems

**\$14m**

Improving your farm  
resource base

**\$7m**

Building skills  
and capacity

**\$18m**

Foundational  
activities

**\$20m**

R&D  
management



Table 1: Five years at a glance

	2016–17	2015–16	2014–15	2013–14	2012–13
<b>GRDC</b>					
Revenue	\$242.4m ▲	\$200.9m <sup>a</sup>	\$203.1m	\$209.1m	\$196.4m
Expenditure	\$227.7m ▲	\$215.0m	\$216.0m	\$184.4m	\$178.0m
Operating result	\$14.8m ▲	–\$14.1m <sup>a</sup>	–\$12.8m	\$24.7m	\$18.4m
Total assets	\$307.2m ▲	\$271.9m <sup>a</sup>	\$278.4m	\$267.7m	\$265.3m
Total equity	\$205.8m ▲	\$187.5m <sup>a</sup>	\$191.3m	\$203.8m	\$180.6m
Industry contributions	\$139.4m ▲	\$110.4m	\$117.5m	\$120.2m	\$118.2m
Commonwealth contributions	\$73.3m ▲	\$70.2m	\$68.0m	\$68.6m	\$62.8m
R&D expenditure	\$198.1m ▲	\$192.8m	\$194.1m	\$165.4m	\$159.2m
Employee benefits	\$10.9m ▲	\$10.5m	\$10.7m	\$9.6m	\$8.2m
Suppliers	\$11.6m ▲	\$9.4m	\$9.4m	\$8.7m	\$7.3m
Number of projects <sup>b</sup>	700 ▼	898	942	939	920
<b>Grains industry</b>					
Estimated number of grain farms <sup>c</sup>	22,156 ▼	24,000	25,350	19,101	19,101
Estimated gross value of production	\$17.0b <sup>d</sup> ▲	\$13.9 <sup>c</sup>	\$13.1 <sup>c</sup>	\$15.4 <sup>c</sup>	\$13.6 <sup>c</sup>
Total grain production—summer and winter crops ('000 tonnes)	63,404 <sup>e</sup> ▲	42,279	40,700	46,361	41,700

a Change in 2015–16 figures as a result of a prior period correction.

b Projects that received funding during the financial year, including R&D investments, research support and foundational projects.

c Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) estimates. The methods used by ABARES to calculate numbers of grain farms have varied since 2012–13, but the results are broadly comparable.

d Latest ABARES forecast for the gross value of production of grains, oilseeds and pulses, excluding rice—from the June 2017 *Agricultural Commodities* report.

e Latest ABARES estimates for total summer and winter crop production, excluding cotton seed and rice—from the June 2017 *Australian Crop Report*.

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Photo: Melanie Jenson

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# Report from the Chair



‘Innovation’ is what drives our businesses, our communities and our industry, but the word means many things to many people. In its simplest form, innovation is defined as change. If grain farmers reflect on their businesses over the past 10 years, the innovation they see is significant—changes in varieties, agronomy, technology and management. Such change and innovation is also required in grain growers’ leading innovation organisation, the GRDC, to ensure that it remains focused on delivering for growers, now and into the future.

The GRDC Board has not been standing still—over the past 18 months, the Board has enabled and supported the transformation of business systems and structures to position the GRDC to be the very best organisation it can be. Profitability is at the centre of the way we view things, and the Board has redefined the GRDC’s purpose to reflect that: we invest in research, development and extension (RD&E) to create enduring profitability for Australian grain growers.

The organisational changes have been driven by the rapid and substantial changes in the grains industry over recent years. Changes in technology, climate, markets and regulatory environments require an agile research organisation that can capture and implement opportunities to increase grower profitability.

As the major investor in grains R&D, the GRDC is determined to fund research that is focused on delivering tangible advances to growers, in terms of greater productivity and improved pathways to market. To facilitate better outcomes for growers, the GRDC has been actively engaging with international researchers to ensure that new technologies developed elsewhere are delivered to Australian farms as quickly as possible.

The Board has also been mindful of the role of our research partners in assisting the GRDC to achieve its purpose. Our research partners need modern and appropriate infrastructure and the right tools to underpin their research efforts. For this reason, the Board has agreed to invest \$15 million to boost the capability of Australian grains R&D through the acquisition or construction of key infrastructure. This investment will enable the construction of new facilities, such as glasshouses, greenhouses, silos, sheds and laboratories, and the enhancement of existing infrastructure.

The national farm finance figures tell us that the growers who achieved the greatest profit margins in 2016–17 were those who had adopted R&D outcomes, with a 10 percent yield increase delivering a 37 percent increase in gross profits. For this reason, it remains vitally important that the GRDC engage with growers, to determine its strategy for investments in RD&E and to provide continual feedback mechanisms that support grower adoption of R&D outcomes.

Our regional advisory panels provide insights into the challenges faced by growers and are instrumental in ensuring that GRDC-supported research is relevant and useful to growers through ground-truthing by people with expertise in grains industry enterprises. It is pleasing that awareness of the regional panels is strong, at 77 percent of growers, but we will continue to undertake activities such as grower updates to ensure that our regional panels are engaged across the spectrum of the grains industry.



Another vital step in engaging with growers and research partners is to strengthen our regional presence by growing our already substantial rural footprint. The Board has considered and approved a strategy to build the capability of the GRDC's regional offices by recruiting additional staff who have the necessary skills, knowledge and mindset to actively manage our investments and engage with growers and researchers to ensure that investments are delivering returns for growers.

Feedback received from levy-paying growers since the GRDC's adoption of the hub-and-spokes model points to strong acceptance of the model and a belief that the GRDC has the balance right. Likewise, formal consultation undertaken with the GRDC's research partners has been positive.

Over the coming months we will be developing our plan for 2018 to 2023, to commence on 30 June 2018. The plan will unashamedly focus on driving grower profitability through on-farm adoption of incremental and transformational innovations.

As we develop the plan, we will engage extensively with our levy payers through practical measures such as discussion panels, face-to-face meetings, focus groups and workshops.

We will also continue to seek feedback through our Grower Survey, which has enabled grain growers to help shape our strategic focus since 1993. I am pleased to say that the GRDC met all performance targets measured in the 2017 survey. In particular, 84 percent of growers view our performance as an investor in grains research positively, while 72 percent believe that they directly benefit from our RD&E and 73 percent agree that the GRDC adds value to farm business activities. The proportion of growers who are comfortable with paying the R&D levy continues to be strong, at 76 percent.

These results encourage and drive us to make the changes necessary for the GRDC to remain a valued and trusted asset for the Australian grains industry.

**John Woods**  
Chair



# Report from the Managing Director



Building a better GRDC for Australian grain growers has been my focus since I joined the corporation in July 2016. The GRDC has a proud record of achievement in investing in RD&E that delivers benefits to grain growers, but preparing to meet future challenges and deliver a better return on grower and government investment has required substantial changes to our business systems, operating model and culture.

These changes have not occurred overnight—we have been consistently refining our structure and processes over the past 18 months. In May 2017, I approved the final phase of a restructure which has realigned our business groups to optimise the RD&E opportunities of the future. In tandem with the adoption of a continuous investment cycle, the new structure positions the GRDC to deliver innovation with the power to transform the profit drivers of Australian grains production.

We have also built up our regional presence to boost our outreach to growers, advisers, farming systems groups, researchers and agribusiness. Our expanded corporate presence is complemented by our regional advisory panels and Regional Cropping Solutions networks, and our connections with Grower Solutions Groups, which extend our reach throughout regional and rural Australia.

During this period of significant change we have continued to achieve outcomes for growers. In 2016–17, the GRDC invested \$198.1 million in RD&E and retained an operational surplus of \$14.8 million, as a result of an above-average grains harvest in Australia.

Investments ranged from short-term, solution-orientated projects, such as compiling trial results to improve understanding of plant available nutrients, to long-term projects on issues such as water use efficiency, genetic bases of heat tolerance in wheat, and the development of new chemistries to combat difficult weeds. New initiatives are underway in the areas of automation, robotics and industrial products, such as bioplastics.

We continue to strategically manage our investments to exploit research capability, build sector capacity and deliver benefits to the grains industry by entering into bilateral agreements with key research partners. A new, 10-year agreement with the New South Wales Department of Primary Industries will deliver more than \$130 million into grains R&D. The agreement provides for long-term investment in maintaining and building scientific capacity, infrastructure and technology, primarily for the New South Wales grains industry, beginning with almost \$65 million over the first five years.

Our bilateral agreement with Curtin University in Western Australia is now delivering tangible outcomes. A new agricultural research facility was opened in Perth, providing a safely contained environment in which at least 80 researchers from the Centre for Crop and Disease Management can study pathogens that pose a threat to Australian farming systems.



We have also committed to contribute \$1 million per year, for five years, to the Legumes for Sustainable Agriculture research hub. Through this investment, grain growers will benefit from the development of improved plant materials to maximise production, environmental sustainability and profitability through legumes, as crops in their own right and in cereal crop rotations.

The GRDC also partnered with the University of Southern Queensland to expand the Centre for Crop Health's glasshouse, laboratory and outdoor trial site capacity, and to establish a new centre for the study of biopesticides. Over time, this investment will bolster Australia's ability to protect its billion-dollar broadacre industries against plant disease and biosecurity threats.

This annual report provides specific information on our performance against the targets of the Agriculture and Water Resources portfolio budget statements and the GRDC's Strategic R&D Plan 2012–17. We achieved good results across all measures. The GRDC's next five-year R&D plan will be finalised in early 2018, articulating our renewed purpose and setting out the strategic framework to underpin our investments in RD&E into the future.

We will continue to invest in RD&E that addresses the challenges and opportunities faced by the Australian grains industry, to create enduring profitability for growers.

**Steve Jefferies**  
Managing Director



# About the GRDC

The GRDC's purpose is to invest in RD&E to create enduring profitability for Australian grain growers.

The GRDC invests in RD&E projects to deliver new and improved varieties, farming practices, technologies and capability to the Australian grains industry. These investments drive the discovery, development and delivery of world-class innovation.

## Structure

The GRDC is led by the Board and managed by the Managing Director, with support from four operational business groups, each headed by a general manager. Four advisory panels provide input on priorities and proposals for RD&E investment.

Figure 1 shows the GRDC's organisational structure at 30 June 2017.

## Board

The GRDC Board is responsible for the stewardship of the corporation, and oversees corporate governance within the GRDC. Its functions include setting strategic direction and monitoring the ongoing performance of the business and the Managing Director.

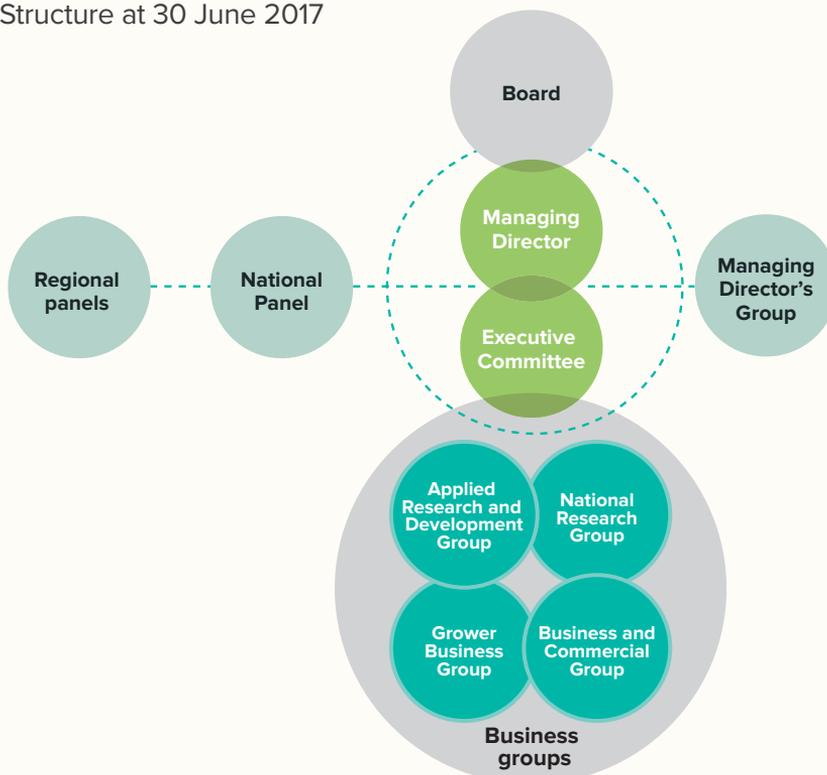
More information on the Board is provided in Part 3 of this report.

## Executive Committee

The Executive Committee leads the GRDC's business activities, advises the Board and implements board decisions. It meets regularly to ensure that the GRDC's operations are monitored and managed efficiently and effectively.

During 2016–17, the committee had four members: the Managing Director; the Deputy Chief Executive Officer/General Manager, Business and Commercial Group; the General Manager, Grower Business Group; and the General Manager, Applied Research and Development Group.

Figure 1: Structure at 30 June 2017



## Business groups

The GRDC's four operational business groups help to achieve the GRDC's purpose as follows:

- The Applied Research and Development Group invests in R&D programs that address key grains priorities across agronomy, farming systems, soils, nutrition and crop protection, and ensures that R&D is integrated with extension.
- The National Research Group invests in programs across statistics, modelling, bioinformatics and genetic technologies, and administers the National Variety Trials program. A common link in these important research areas is the generation of large data sets.
- The Grower Business Group delivers the outputs of research in the form of innovative extension and communication products and services that meet the needs of growers and their advisers in each region.
- The Business and Commercial Group accesses and develops innovation from Australia and overseas to ensure that it is commercialised in a way that optimises benefits for Australian grain growers. The group also provides enabling functions to support the delivery of research, such as financial management, information technology, business management, governance processes and reporting, economic modelling, and strategy development.

## Advisory panels

The National Panel:

- assesses national RD&E priorities across the GRDC's investment portfolio and makes recommendations on investment priorities and portfolio balance to the Managing Director
- assists the Managing Director to maintain links with grain growers, advisers and research partners.

The National Panel is informed by the knowledge and experience of three regional advisory panels—composed of grain growers, agribusiness representatives and researchers—representing each of Australia's major grain-growing regions.

More information on the advisory panels is provided on the GRDC website, at [grdc.com.au/about/what-we-do/regional-panels](http://grdc.com.au/about/what-we-do/regional-panels).

## Collaboration

Collaboration is at the heart of the GRDC's approach to adding value to the Australian grains industry. The majority of the GRDC's investment in RD&E is with partners that co-fund the work and conduct the requisite activities.

Partners include government agencies; research organisations, including cooperative research centres, universities and other rural R&D corporations; commercial plant breeding and seed companies; agricultural supply companies and advisers; and grain marketers, exporters and end-users.

To leverage Australia's investment in grains R&D as part of the global effort, and to access technologies and intellectual property that would otherwise be unavailable, the GRDC also collaborates with public and private research organisations overseas. Notable examples include:

- strategic alliances with the
  - International Maize and Wheat Improvement Center (CIMMYT)
  - International Center for Agricultural Research in the Dry Areas
  - International Crop Research Institute for the Semi-Arid Tropics
  - International Wheat Yield Partnership
- a joint venture with Bayer, the Herbicide Innovation Partnership.

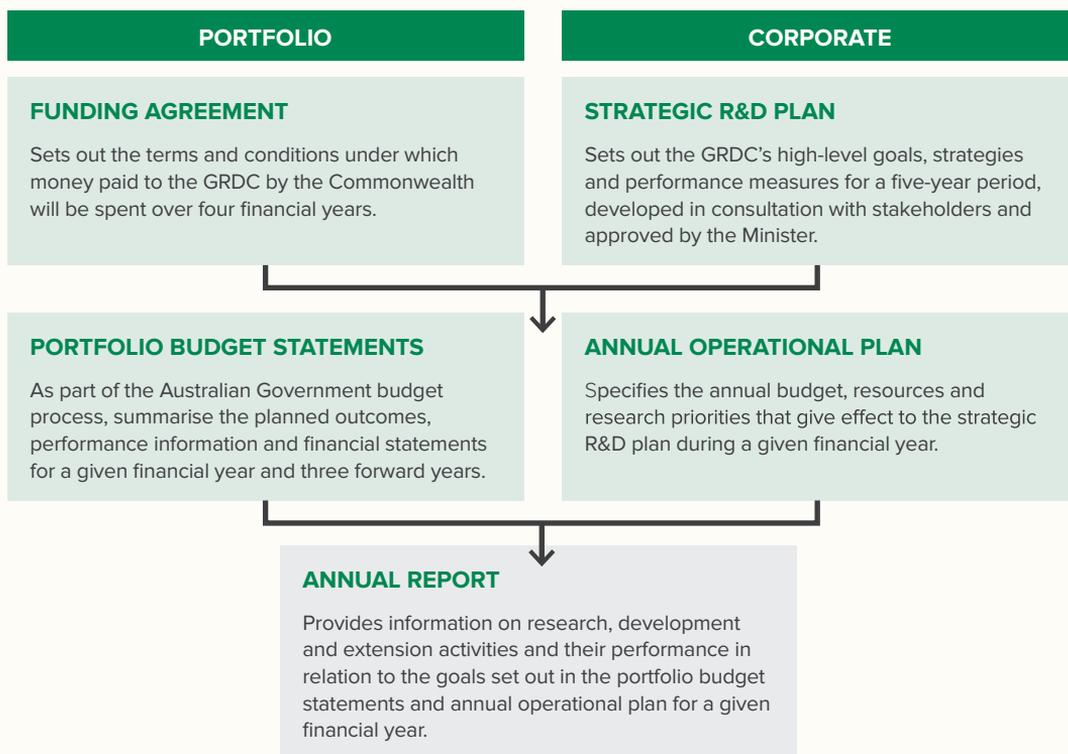
## Planning and reporting

The GRDC is strongly committed to being accountable for its performance. More information on the GRDC's accountability to grain growers, and to the Australian Government and the broader community, is provided in Part 3 of this report.

Figure 2 outlines the core elements of the GRDC's annual cycle of planning and reporting against planned objectives and statutory requirements.



Figure 2: Planning and reporting framework



Note: These documents are available at [grdc.com.au/about/corporate-governance](http://grdc.com.au/about/corporate-governance).

## Strategic R&D plan

The five-year strategic R&D plan is based on the key RD&E priorities of the Australian Government and the grains industry, and provides a framework for a balanced portfolio of short-, medium- and long-term investments, as shown in Figure 3.

## Annual operational plan

The annual operational plan describes the activities that the GRDC will undertake to implement the goals of the strategic R&D plan in the financial year ahead.

It includes an outcome-based performance measurement framework that is consistent with the performance measures set out for the GRDC in the Agriculture and Water Resources portfolio budget statements.

## Annual report

At the end of the financial year, the GRDC publishes an annual report to Parliament that addresses a range of reporting requirements. Details are provided in the compliance index of this report.

The annual report includes the audited financial statements, and information on the GRDC's results against corporate and portfolio performance measures.

## Performance framework

The Strategic R&D Plan 2012–17 sets out the outcomes that the GRDC's RD&E investments will achieve, over the life of the plan and in the longer term, to meet the objectives of the Australian Government and the grains industry. The planned outcomes are the basis of the GRDC's annual performance targets, as discussed in Part 2 of this report.

Figure 3 provides an overview of the GRDC's performance framework in 2016–17.

Figure 3: Performance framework

GOVERNMENT AND INDUSTRY OBJECTIVES	AUSTRALIAN GOVERNMENT OBJECTIVES			INDUSTRY OBJECTIVES		
	<i>Primary Industries Research and Development Act 1989</i>	<b>Science and Research Priorities</b>	<b>Rural Research, Development and Extension Priorities</b>	<i>Grains Industry National Research, Development and Extension Strategy 2014</i>	<b>Industry priorities</b>	
	Increased economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of grain Sustainable use and management of natural resources More effective use of the resources and skills of the community in general and the scientific community in particular Development of scientific and technical capacity Development of the adoptive capacity of grain growers Improved accountability for expenditure on R&D activities	Food Soil and water Transport Cybersecurity Energy Resources Advanced manufacturing Environmental change Health	Advanced technology Biosecurity Soil, water and managing natural resources Adoption of R&D	Better varieties—to lift productivity and value Improved practices—to enhance productivity and sustainability Supply chain innovation and market competitiveness Building farm business and industry capability	Meeting market requirements Improving crop yield Protecting your crop Advancing profitable farming systems Improving your farm resource base Building skills and capacity	
GRDC RD&E INVESTMENT THEMES	<b>1 Meeting market requirements</b>	<b>2 Improving crop yield</b>	<b>3 Protecting your crop</b>	<b>4 Advancing profitable farming systems</b>	<b>5 Improving your farm resource base</b>	<b>6 Building skills and capacity</b>
<i>Intermediate outcomes (5 years)</i>	Understanding market opportunities for Australian grain Crop and variety selection aligned with market requirements Crop production aligned with market requirements Grain harvest and storage practices aligned with market requirements	Genetic yield potential and stability improvement of cereal varieties Genetic yield potential and stability improvement of pulse varieties Genetic yield potential and stability improvement of oilseed varieties	Effective, sustainable and efficient management of weeds Effective, sustainable and efficient management of vertebrate and invertebrate pests Effective, sustainable and efficient management of cereal rusts Effective, sustainable and efficient management of cereal (non-rust), pulse and oilseed fungal pathogens Effective, sustainable and efficient management of nematodes Effective, sustainable and efficient management of viruses and bacteria Biosecurity and pesticide stewardship	Knowing what is important (key business drivers) Planning strategically (building system benefits and rotations) Responding tactically (individual crop agronomy)	Understanding and adapting to climate variability Improving soil health Managing water use on dryland and irrigated grain farms Understanding and valuing biodiversity Communication of sustainable production methods	Grains industry leadership and communication Capacity building in the extension sector Capacity building in the R&D sector Capacity building for grain growers
<i>Aspirational outcomes (10+ years)</i>	Australian grain growers maintain and increase access to current and future grain markets by aligning on-farm production practices with quality and functionality requirements	Cereal, pulse and oilseed varieties with significant, sustained and stable improvements in water-limited yield potential over current elite varieties in key agroecological zones and across a range of seasons	Australian grain growers managing their farms to maximise profit and reduce risk by adopting effective, sustainable and efficient control of weeds, pests and diseases	Australian grain growers managing farming systems that are able to respond and adapt to changing environmental and market conditions to reduce risk and deliver an increase in profitability	Grain growers valued for adopting practices that improve regional habitat, soil, water and atmosphere resources in a changing climate	A dynamic Australian grains industry with the skills and capacity to continuously innovate
GRDC CORPORATE STRATEGIES	Create value	Coordinate nationally	Deliver regionally	Connect globally	Engage with growers and industry	
GRDC PORTFOLIO OUTCOME	New information and products that enhance the productivity, competitiveness and environmental sustainability of Australian grain growers and benefit the industry and wider community, through planning, managing and implementing investments in grains research and development					
GRDC VISION	A profitable and sustainable Australian grains industry, valued by the wider community					



## Funding

The GRDC is principally funded by levies paid by grain growers and contributions paid by the Australian Government.

The levies are collected at the first point of sale and based on the net farm gate value of 25 crops:

- wheat
- coarse grains—barley, oats, sorghum, maize, triticale, millets/panicums, cereal rye and canary seed
- pulses—lupins, field peas, chickpeas, faba beans, vetch, peanuts, mungbeans, navy beans, pigeon peas, soybeans, cowpeas and lentils
- oilseeds—canola, sunflower, safflower and linseed.

The Australian Government matches the levy contributions generally up to a limit of 0.5 percent of the three-year rolling average of the gross value of production of the 25 leviable crops.

Other sources, including interest, royalties and grants, contribute a small proportion of the GRDC's income.

## Location

Australian grains production occurs across three regions—comprising 13 different agroecological zones—with distinct climate, cropping and market characteristics, as described in Figure 4.

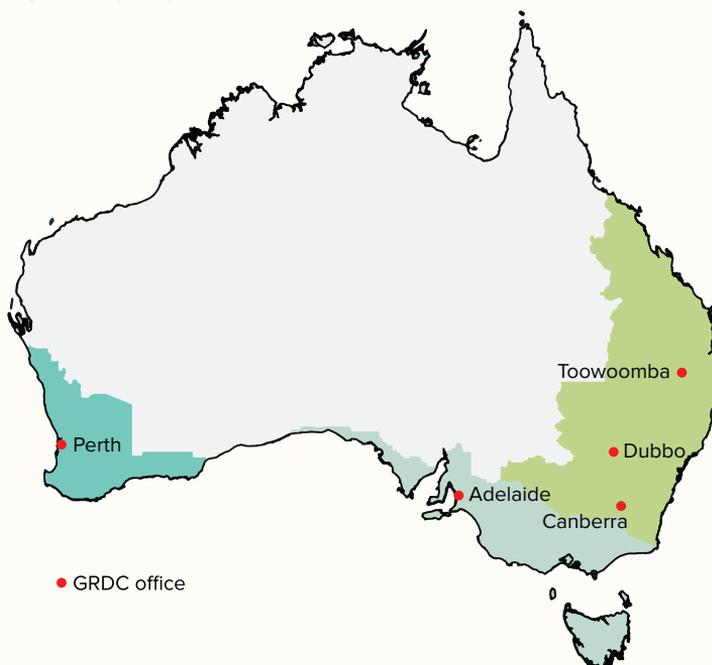
The GRDC manages RD&E investments and delivers services to meet the needs of each region and the industry as a whole, through a network of five offices: a national office in Canberra and regional offices in Adelaide, Dubbo (New South Wales), Perth, and Toowoomba (Queensland).

This network enhances the GRDC's ability to deliver tailored benefits to growers in regional locations. Regional staff have a particular focus on short-term and medium-term projects that address priority issues relating to farming systems, agronomy, soils, weeds, pests and diseases.

Contact details are listed inside the back cover of this report.



Figure 4: Grain-growing regions



WESTERN REGION	SOUTHERN REGION	NORTHERN REGION
<p>Soil fertility is generally low to very low, and yield depends on winter and spring rainfall.</p> <p>In many areas, low yields are compensated for by the large scale and degree of mechanisation of cropping enterprises.</p> <p>Long-term variability in seasonal rainfall and production is lower in the coastal areas than in the Northern and Southern regions.</p> <p>Wheat, barley, canola and lupins are the dominant crops. Mixed farming systems with livestock are generally less important.</p> <p>The region has a relatively small domestic market and exports more than 85 percent of its grain production.</p> <p>Key characteristics:</p> <ul style="list-style-type: none"> <li>• low soil fertility</li> <li>• Mediterranean climate</li> <li>• dependence on winter rainfall as spring rainfall is unreliable</li> <li>• large enterprise size</li> <li>• leading grain storage practices</li> <li>• narrow range of crop options</li> <li>• dominant export market, and transport advantage to South-East Asia.</li> </ul>	<p>The region has a diverse suite of soils with generally low fertility and many subsoil constraints, such as salinity, sodicity and toxic levels of some elements. However, some areas have very productive soils.</p> <p>Yield potential depends on seasonal rainfall, especially in autumn and spring, and is less dependent on stored soil moisture than in the Northern Region.</p> <p>Crop production systems are varied and include many mixed farming enterprises with significant livestock and cropping activities.</p> <p>Key characteristics:</p> <ul style="list-style-type: none"> <li>• relatively infertile soils</li> <li>• temperate climate</li> <li>• yield depends on reliable spring rainfall</li> <li>• smaller enterprise size and diverse production patterns and opportunities</li> <li>• innovative phase farming with perennials</li> <li>• shift toward intensive livestock production and demand for feed grains</li> <li>• large and diverse domestic market.</li> </ul>	<p>Soil fertility is generally high, although there is increasing evidence that this has been run down over time.</p> <p>The region has relatively high seasonal rainfall and production variability compared with the other two regions. Yield depends, to a significant degree, on conservation of soil moisture from summer rainfall.</p> <p>The region has the highest diversity of crop production, including maize, sorghum and tropical pulses as well as wheat, barley, winter-growing pulses and oilseeds. It is the largest source of Australia's premium hard high-protein wheat.</p> <p>Demand for feed grains from the region's livestock industries is a key driver of production.</p> <p>Key characteristics:</p> <ul style="list-style-type: none"> <li>• high proportion of vertosol clay soils</li> <li>• tropical, sub-tropical and temperate environments</li> <li>• summer dominant cropping in Queensland, winter dominant cropping in New South Wales</li> <li>• high proportion of mixed farming, including sugarcane, cotton and pastures</li> <li>• large and diverse domestic and export markets.</li> </ul>





# 2 Our performance

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# Annual performance statements

The Board, as the accountable authority of the Grains Research and Development Corporation (GRDC), presents the 2016–17 annual performance statements of the GRDC, as required under paragraph 39(1)(a) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and section 28 of the *Primary Industries Research and Development Act 1989* (PIRD Act). In the Board's opinion, these annual performance statements are based on properly maintained records, accurately reflect the performance of the GRDC, and are in accordance with subsection 39(2) of the PGPA Act.

## Purpose

The GRDC's purpose is to invest in RD&E to create enduring profitability for Australian grain growers.

## Portfolio outcome

The GRDC delivered one outcome of the Agriculture and Water Resources portfolio in 2016–17:

*New information and products that enhance the productivity, competitiveness and environmental sustainability of Australian grain growers and benefit the industry and wider community, through planning, managing and implementing investments in grains research and development.*

## Results

The results against the GRDC's performance criteria in the 2016–17 portfolio budget statements are outlined in Table 2. The results against measures in the Strategic R&D Plan 2012–17 and Annual Operational Plan 2016–17 are provided in tables 3 to 8 in the chapters on the GRDC's six investment themes.

Table 2: GRDC performance against portfolio budget statements measures

KEY PERFORMANCE INDICATOR	TARGET	RESULT
<b>Theme 1</b>		
Australian Export Grains Innovation Centre (AEGIC) joint venture is established and operating appropriately.	Required market information available	Achieved. AEGIC investment was reviewed and extended to 2020, and technical markets managers and quality managers for key crops were appointed.
Growers are interested in the benefits of measuring grain quality to meet customer requirements.	90%	Not achieved. 77% of growers are aware of and interested in the benefits of measuring grain quality. (2017 Grower Survey)
Growers storing grain on farm use sealed silos to meet market requirements and provide for the continued effectiveness of pest control measures.	70%	Achieved. 70% of growers store grain on farm in sealed silos that comply with the Australian Standard. (2017 Grower Survey)
<b>Theme 2</b>		
New cereal, pulse and oilseed varieties have minimum increases in genetic yield potential per annum as measured in National Variety Trials (NVT).	Cereals 1% Pulses 2% Oilseeds 1.5%	Achieved. NVT analysis has demonstrated that new varieties have yield potential increases greater than target levels.
New varieties currently available meet the expectations of growers.	60%	Achieved. 79% of growers agree that new varieties meet their expectations. (2017 Grower Survey)



Table 2 (continued)

KEY PERFORMANCE INDICATOR	TARGET	RESULT
Growers and advisers use NVT data in selection of varieties to plant.	40% access data, of which 90% consider it helpful	Achieved. 48% of growers use NVT data or visit NVT field days and, of those, 95% find that NVT information assists their decisions on varieties to plant. (2016 Grower Survey)
<b>Theme 3</b>		
Growers and advisers are aware of and use integrated weed, pest or disease management practices.	70% are aware, 50% use	Achieved. <ul style="list-style-type: none"> <li>83% of growers are aware of integrated weed management and 72% practise it.</li> <li>80% of growers are aware of integrated pest management and 59% practise it.</li> <li>70% of growers are aware of integrated disease management and 55% practise it.</li> </ul> (2017 Grower Survey)
Growers undertake on-farm practices to maintain or improve their biosecurity.	50%	Achieved. 87% of growers undertake on-farm practices to maintain or improve biosecurity. (2017 Grower Survey)
<b>Theme 4</b>		
Growers place a high importance on the use of decision tools to assist them with strategic or tactical decision making.	70%	Achieved. 79% of growers place a high importance on using decision support tools. (2017 Grower Survey)
Growers have a whole-farm business plan which takes account of strategic opportunities, constraints and risks.	25%	Achieved. 29% of growers have a whole-farm business strategic plan. (2016 Grower Survey)
<b>Theme 5</b>		
Growers consider the potential effects of climate change on their farm business when making long-term decisions.	60%	Achieved: 66% of growers have adopted new management practices to manage climate variability or climate change. (2016 Grower Survey)
Growers undertake activities to improve the condition and productive capacity of their soils.	70%	Achieved. 98% of growers undertake activities to improve the condition and productive capacity of their soils. (2017 Grower Survey)
Growers use nutrient budgeting to better match application with anticipated crop needs.	65%	Achieved. 68% of growers use nutrient budgeting. (2014 Grower Survey)
<b>Theme 6</b>		
Each year Nuffield scholars include people from the grains industry.	At least three	Achieved. The GRDC supported three Nuffield scholars.
Growers and advisers undertake at least one activity each year to learn more about opportunities to improve farm profit or sustainability.	75%	Achieved. 85% of growers have undertaken at least one learning activity in the past year. (2017 Grower Survey)

Note: Key performance indicators and targets are defined in the Agriculture and Water Resources Portfolio Budget Statements 2016–17, pages 145–146. Survey results are derived from the most recent survey in which the target was measured.



## Analysis

Feedback on the GRDC's performance is measured through the GRDC Grower Survey, which has been conducted regularly since 1993. In recent years the survey has collected data on key performance indicators as well as measuring the GRDC's success in achieving goals set out in its five-year strategic R&D plan.

In total, 1,200 grain growers are interviewed for the survey, representing all of the agroecological zones in Australia's grain-growing regions. A quota is set on the number of interviews to be conducted in each zone, and final data is weighted to represent the true geographical spread of grain growers.

The GRDC achieved the majority of its key performance indicator targets for 2016–17, with one target not achieved.

The result for the second Theme 1 key performance indicator was 77 percent of growers aware of and interested in the benefits of measuring grain quality, against a target of 90 percent. While grain quality is currently measured on less than half of the farms surveyed, survey results suggest that a large proportion of the growers who are not currently measuring grain quality will be interested in doing so in future. It is possible that there is a knowledge gap in this area, particularly among growers with smaller cropping enterprises; the GRDC will consider how it can provide this group with more insights and support.

Several results exceeded targets in 2016–17. Notably, nearly all growers (98 percent) have undertaken activities to improve the condition and productive capacity of their soil—this result is the highest to date.

The target of 50 percent of growers undertaking practices to improve their biosecurity was also exceeded, as 87 percent of growers reported that they had undertaken this practice change. The result is significantly higher than the result in 2014 (53 percent) and, notably, considerable increases are evident across each region and scale of enterprise.

The survey results suggest that the GRDC's focuses on biosecurity and soil health practices have resulted in widespread practice change since 2014. Encouragingly, activities resulting in benefits to the environment were undertaken on almost all farms (99 percent), typically through minimising weed, pest and disease resistance to chemical controls (92 percent), managing residues and/or minimising chemical usage (82 percent), or planting trees (76 percent).

Growers are very aware of the costs and increasingly aware of the environmental impacts of applying chemical products to control weeds, pests and diseases. Research is providing information on resistance, natural management strategies and biological control mechanisms. In 2016–17, 83 percent of growers were aware of integrated weed management and 80 percent were aware of integrated pest management.

The GRDC invests in a range of projects to improve the availability and usefulness of decision support tools for growers—examples in 2016–17 included a review of the nitrogen decision support tools available in the Southern Region, and work to develop an online tool for determining the optimal application of deep phosphorus.

Growers have responded strongly by taking up new tools and apps. In 2017, 79 percent of growers reported having used a decision support tool to assist with tactical decision making. The proportion is higher among enterprises producing greater than 5,000 tonnes and expanding enterprises. This question has been included in the survey since 2013 and the 2017 result is the highest recorded.



These are just some examples of the GRDC's investments in R&D that delivers a return to Australian grain growers. The investments range from small, short-term research activities designed to deliver a quick localised benefit to growers, to long-term, scientifically or technologically complex investments that may deliver a benefit across the broader community of growers and the Australian economy in general. The total RD&E investment in 2016–17 was \$198 million, invested in more than 560 projects.

Some key investments in 2016–17 included the gathering of market intelligence on end-user requirements in domestic and export grains markets; pre-breeding research to inform the development of barley varieties with improved adaptation to acid soils; field work to improve understanding of the costs and benefits of deep placement of nutrients; and a project to provide knowledge to growers to better equip them to improve their soil organic matter. Other investments included continued support for the development of knowledge and management tools to minimise the spread and impact of Russian wheat aphid.

Continuing long-term and transformational investments include:

- improving quality traits in canola to increase market value
- eliminating defects in chickpeas
- developing genetic marker tools for prevention of late-maturity alpha amylase in wheat
- developing molecular markers for root hair traits and enhanced phosphorus use efficiency in wheat
- identifying and characterising wheat germplasm with improved radiation use efficiency and photosynthetic performance.

The GRDC's overall performance as an investor in research was rated highly by 84 percent of grain growers surveyed in 2017. The proportion of growers surveyed that feel they have directly benefited from GRDC-funded RD&E projects is 72 percent, while the proportion of growers that expected to be profitable in 2016–17 is 85 percent.



# Theme 1—Meeting market requirements

This theme describes the framework for the GRDC's investments in grain quality and functionality to help growers maintain and expand access to markets.

Australia's domestic and international customers seek a consistent supply of grain that is both:

- a quality product that is compliant with statutory and customer-specific requirements
- a functional product that performs reliably for the desired end use.

To deliver the highest value to growers, the GRDC must understand the requirements and the dynamics of current domestic and export markets for feed and food grains, and those of likely future markets.

Through the 'Meeting market requirements' theme, the GRDC interacts closely with participants in the Australian grains value chain to better understand market requirements, particularly for quality and functionality, to enable growers to maintain or increase access to current markets and secure access to new higher valued markets.

## Aspirational outcome

Australian grain growers maintain and increase access to current and future grain markets by aligning on-farm production practices with quality and functionality requirements

RD&E	PROJECTS	INVESTMENT
New	25	\$3.09m
Ongoing	32	\$4.77m
<b>Total</b>	<b>57</b>	<b>\$7.86m</b>

## Investment highlight—Gathering market intelligence

The Australian Export Grains Innovation Centre (AEGIC), together with industry partners, is building information packages on end-user quality requirements for grains in domestic and export markets, and developing an economic model to assist research investment decisions. Data is being collected and documented on cereals, pulses and oilseeds.

In 2016–17, AEGIC reviewed export markets for wheat, malting and feed barley, food and feed sorghum, canola, and pulses, with a focus on the drivers of demand in the South-East Asia region. The research found that:

- Millers may purchase grains from several exporting countries and blend grains from a variety of sources to minimise their costs. This creates opportunities to produce wheat with specific traits to increase the functionality of flour. While wheat traditionally has been exported as a grain, economies of scale are changing the market dynamics, and large milling operations in some countries now export flour into traditional wheat markets.
- Beer consumption per person is slowing in many countries. Some markets are still growing but at a slower rate. More mature markets are moving into niche varieties of barley, and some brewers are using wheat instead of barley. In some countries, specialty brew pubs are becoming mainstream and increasing demand for specialty barley varieties. These market outcomes have implications for barley grading and segregation systems.
- Markets for feed grains are projected to increase for chicken, pork, beef, dairy and fish production, as consumer tastes and demographics evolve. Feed grain demand is challenging to estimate, due to the dynamics of livestock markets, protein prices and market restrictions. The increasing production of soybeans for the biodiesel market, which has also increased the supply of soybean meal for use in animal feeds, has also affected demand.
- Trends in demand for traditional canola versus GM canola are changing in reaction to the increasing demand for biodiesel. The food market for traditional canola in Japan is projected to slow, given its aging demographic. The production of biodiesel and ethanol from maize and soybeans has induced a large change in demand for grains, particularly in China.
- Pulse demand in Asia is expected to increase as the world's population grows, and as an increasing proportion of consumers in certain countries move into higher income brackets. Consumers in some countries are using more pulses, relative to rice and wheat, to increase the protein in their diets. Other consumers consider pulses to be a healthier alternative to animal protein sources.

The tools developed by AEGIC will improve the Australian grains industry's understanding of the quality and functionality requirements of key markets and inform the GRDC's decisions on future RD&E investment.



## Theme performance

Table 3 details the results of Theme 1 against the planned outcomes of the Strategic R&D Plan 2012–17 and targets of the Annual Operational Plan 2016–17.

Table 3: Theme 1 performance against GRDC strategic measures

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Understanding market opportunities for Australian grain</b>		
<p>The GRDC establishes relationships with the value chain and regulatory authorities to access information about market requirements, trends and opportunities.</p> <p><i>Key metric: Australian Export Grains Innovation Centre (AEGIC) joint venture is established and operating appropriately.</i></p>	<p>A GRDC-supported project provides strategic oversight and coordination of grain protection chemicals.</p>	<p>Achieved. A five-year contract to provide strategic oversight and coordination of grain protection chemicals commenced on 1 July 2016.</p> <p><i>Achieved. AEGIC investment was reviewed and extended to 2020, and technical markets managers and quality managers for key crops were appointed.</i></p>
<p>The GRDC makes greater use of information on current and potential future markets to guide investment decisions.</p>	<p>The Grains Industry Market Access Forum (GIMAF) works with industry and government to provide foundational documents on use of chemicals and contamination of grain with weed seeds and diseases, to facilitate ongoing and new market access.</p>	<p>Achieved. GIMAF developed and compiled relevant documentation, and work to prioritise and inform industry responses to technical trade barriers commenced.</p>
<b>Crop and variety selection aligned with market requirements</b>		
<p>A greater proportion of growers and advisers use market information to inform crop and variety selection.</p>	<p>Through GIMAF, the National Working Party on Grain Protection, and the GRDC's Minor Use Program and Pathways to Registration Project, growers are made aware of access requirements for major markets.</p>	<p>Achieved. Growers received information on chemical management and market access through stewardship modules and GRDC updates. Some access issues are being addressed through registration of new uses.</p>
<p>Increased interaction between grains industry participants (growers, pre-breeders, breeders and value chain participants) and regulatory authorities creates awareness of the quality and functionality market access requirements.</p>	<p>The GRDC provides information on crop quality and market access requirements to key industry stakeholders.</p>	<p>Achieved. Reports from crop quality and market access projects were rolled out to industry stakeholders through AEGIC workshops.</p>
<p>Breeders and pre-breeders use market information to deliver varieties that meet the requirements of current and future markets.</p> <p><i>Key metric: Independent wheat variety classification is maintained.</i></p>	<p>GRDC-supported projects provide market information to breeders and pre-breeders through a combination of workshops, field days and research updates which supports the delivery of varieties to meet current and future market requirements.</p>	<p>Achieved. Reports from crop quality and market access projects were rolled out to industry stakeholders through AEGIC workshops and GRDC research updates.</p> <p><i>Achieved. Independent wheat variety classification is maintained through Wheat Quality Australia, a company limited by guarantee of which the GRDC and Grain Trade Australia are the members and the GRDC is the predominant investor.</i></p>



Table 3 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Crop production aligned with market requirements</b>		
A greater proportion of growers and advisers use relevant market information to inform decisions about in-crop management practices.	GRDC-supported projects provide growers with agronomy and farming systems management packages that assist them to achieve grain quality requirements of target markets.	Achieved. Regional sowing guides and variety-specific agronomy packages provided growers with agronomy and farming systems management information to help them achieve quality targets.
A greater proportion of grain growers adjust pest, weed and disease management practices to meet market requirements.	Growers use information contained in GRDC-supported products to manage weeds, pests and diseases to ensure that grain meets market requirements.	Achieved. Communication by the GRDC and GIMAF informed growers of minimum residue levels and specifications, which led to key markets for barley and wheat remaining open.
<b>Grain harvest and storage practices aligned with market requirements</b>		
A greater proportion of growers use harvesting strategies that maximise the opportunity to meet the requirements of their target market.	Growers are aware of harvesting strategies to maximise grain quality.	Achieved. Workshops on harvester fires and on improving on-farm grain storage management practices were delivered for growers.
A greater proportion of growers are aware of the quality and functionality of the grain delivered to their customer or entering contract storage.  <i>Key metric: 90% or more of growers are aware of and interested in the benefits of measuring grain quality.</i>	Through a combination of workshops, social media and publications, growers are made aware of opportunities to increase grain quality and functionality.	Achieved. Reports from crop quality and market access projects were rolled out to growers through workshops and a subscription email update service.  <i>Not achieved. The 2017 Grower Survey shows that 77% of growers are aware of and interested in the benefits of measuring grain quality.</i>
A greater proportion of growers use storage practices to meet market requirements and provide for the continued effectiveness of pest control measures.  <i>Key metric: At least 70% of growers storing grain on farm use sealed silos.</i>	GRDC-supported projects provide information to growers on controlling pests of stored grain.	Achieved. Information was provided to growers on improved practices for on-farm grain storage management and new technology for stored-grain pest management.  <i>Achieved. The 2017 Grower Survey shows that 70% of growers store grain on farm in sealed silos that comply with the Australian Standard.</i>
The GRDC uses market access information to provide growers with the harvest and storage management packages and tools to comply with market requirements.	GRDC-supported projects develop and communicate harvest strategies and on-farm grain storage techniques to comply with market requirements.	Achieved. Information was provided to growers on improving on-farm grain storage management practices.



## Theme 2—Improving crop yield

This theme describes the genetic approaches and associated tools and technologies that can be applied to produce varieties with increased water-limited yield potential (WLYP).

The WLYP of a variety is the maximum yield attainable when the variety is grown under average, rain-fed conditions without the limiting impacts of nutrient deficiency, soil toxicity, weed competition, insect damage and disease.

Although the actual yield that is captured on farm depends on a grower's ability to manage the biotic and abiotic factors that contribute to yield losses (and the cost limitations of management practices), WLYP is genetically determined.

Plant breeders aim to continually improve the WLYP of crops through new varieties. However, for many crops, continued improvements in genetic yield potential and stability are becoming harder to realise.

The 'Improving crop yield' theme focuses on the delivery of new crop varieties with demonstrable improvements in genetic yield potential and yield stability. Given the wide range of farming environments and crop choice, targets will be crop specific and region specific.

### Aspirational outcome

Cereal, pulse and oilseed varieties with significant, sustained and stable improvements in water-limited yield potential over current elite varieties in key agroecological zones and across a range of seasons

RD&E	PROJECTS	INVESTMENT
New	38	\$17.02m
Ongoing	77	\$21.39m
<b>Total</b>	<b>115</b>	<b>\$38.41m</b>

## Investment highlight—Breeding barley for acid soils

In terms of cropping area, soil constraints—in particular, acidity and high levels of toxic aluminium—are the largest factor limiting sustainable barley production in Australia.

GRDC-supported pre-breeding research has assisted Australian breeders to develop barley varieties with improved adaptation to acid soils. The successful identification of tolerant germplasm and development of diagnostic molecular markers led to the release of Litmus<sup>®</sup>, an early-maturing, high-yielding barley variety with high tolerance of acidity and aluminium.

However, the appearance of blue aleurone—a fault in the colour of the grain kernel—has become a significant hurdle for the adoption of Litmus<sup>®</sup>. Grain Trade Australia receival standards currently have a nil tolerance for blue aleurone grain in malt barley deliveries and a maximum allowance of 1 in 100 grains in feed barley.

The GRDC is supporting research to establish a cost-effective strategy for the elimination of the blue aleurone defect and the development of new high-yielding varieties for barley growers in areas affected by soil constraints.

This will include providing barley pre-breeding entities and breeders with:

- diagnostic markers for enhanced acidity and alkalinity tolerance
- new knowledge about the interactions between tolerances to abiotic stresses, including acidity, alkalinity, waterlogging, salinity and high boron levels
- a phenotyping protocol for the blue aleurone defect
- germplasm with a non-blue aleurone xenia 3 locus.

In consultation with Australian barley breeders, 288 diverse elite barley lines were selected for validation of diagnostic molecular markers, of which 167 were selected for further phenotyping for blue aleurone and acid soil tolerance at three sites in Western Australia. A subset of those lines was tested in four different acid soils and the best sources of tolerance were identified.

The project made significant breakthroughs in 2016. In particular:

- A quick and reliable method was developed for phenotyping the blue aleurone expression.
- Lines with acid soil tolerance but without blue aleurone were identified.
- A candidate gene for blue aleurone was isolated and gene-specific molecular markers were developed.

Breeders have shown strong interest in the project outputs, and new, acid soil tolerant barley with white aleurone is on the horizon.

The future use of germplasm and tools developed in this project is expected to increase barley yields by 10 percent, which could provide economic benefits in the order of \$200 million per year. It will also reduce yield fluctuation due to hostile soils, stabilising barley production.



## Theme performance

Table 4 details the results of Theme 2 against the planned outcomes of the Strategic R&D Plan 2012–17 and targets of the Annual Operational Plan 2016–17.

Table 4: Theme 2 performance against GRDC strategic measures

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Genetic yield potential and stability improvement of cereal varieties</b> <b>Genetic yield potential and stability improvement of pulse varieties</b> <b>Genetic yield potential and stability improvement of oilseed varieties</b>		
<p>Breeders and industry pre-breeders increase their level of collaborating to identify and prioritise traits, tools and germplasm requirements to support target gains in yield potential and stability.</p> <p><i>Key metric:</i></p> <ul style="list-style-type: none"> <li><i>New cereal varieties have minimum yield increases equivalent to 1% per annum as measured in National Variety Trials (NVT).</i></li> <li><i>New pulse varieties have minimum yield increases equivalent to 2% per annum as measured in NVT.</i></li> <li><i>New oilseed varieties have minimum yield increases equivalent to 1.5% per annum as measured in NVT.</i></li> </ul>	<p>Strong interactions between researchers and breeders are defining germplasm requirements and breeding tools within the:</p> <ul style="list-style-type: none"> <li>• Crown Rot Initiative</li> <li>• National Barley Foliar Pathogen Variety Improvement Program</li> <li>• Pulse Molecular Marker Program</li> <li>• National Brassica Germplasm Improvement Program.</li> </ul>	<p>Achieved. Representatives of the Crown Rot Initiative and the National Barley Foliar Pathogen Variety Improvement Program met with breeders to report progress and receive feedback.</p> <p>Markers developed within the Pulse Molecular Marker Program are being deployed in field pea and lentil breeding programs.</p> <p>The National Brassica Germplasm Improvement Program is being redesigned to improve the delivery of pre-breeding outputs to breeders.</p> <p><i>Achieved. NVT analysis has demonstrated that new varieties have yield potential increases greater than target levels.</i></p>



Table 4 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
Increased number of pre-breeders develop priority traits in breeder-defined genetic backgrounds, and ready-to-implement selection tools to drive rapid adoption by breeding programs.	Pre-breeding research provides germplasm and selection tools to accelerate the development of improved varieties of pulses with increased yield, disease resistance and herbicide tolerance.	Achieved. Screening methodologies were developed for fungal and bacterial diseases and root-lesion nematodes. Faba bean germplasm combining early maturity and chocolate spot resistance was developed.
	A cost-effective diagnostic screening method is developed to assist barley-breeding programs to eliminate the undesirable blue aleurone trait from breeding lines with acid soil tolerance.	Achieved. A phenotyping method for blue aleurone expression and molecular markers for blue aleurone were developed; and lines with acid soil tolerance and white aleurone were identified.
	Pre-breeding targets are identified for genetic sources of heat tolerance and resistance to crown rot in barley.	Achieved. 35 new molecular markers were developed to map heat tolerance, and further quantitative trait loci were identified. Potential new sources of crown rot resistance were assessed.
	Genetic diversity in wheat is exploited by importing selected lines from international germplasm collections and screening them for increased reproductive frost tolerance.	Achieved. Wheat germplasm from over 40 countries has been imported into Australia for evaluation. National Frost Initiative screening of imported lines commenced in South Australia.
	Genetic diversity in chickpeas is exploited by importing wild <i>Cicer</i> lines from Turkey and screening them for increased cold tolerance, improved nematode resistance and superior adaptation traits.	Achieved. Phenotyping of imported lines commenced. Studies identified significant variation in productivity and water use efficiency, and revealed that wild lines are more chilling tolerant than cultivated chickpea.
Increased number of breeders and pre-breeders use accurate data analysis methods to interpret yield potential, stability and environmental data that inform selection for target production environments.	Statistics for the Australian Grains Industry (SAGI) outputs are used to design and analyse experiments and trials, to increase efficiency and ensure consistent and reliable data, in many GRDC projects, including the National Frost Initiative, the National Barley Foliar Pathogen Variety Improvement Program and all projects conducted at managed environment facilities.	Achieved. SAGI outputs were used in many GRDC projects, not including the National Barley Foliar Pathogen Variety Improvement Program, which was not covered in the SAGI contract.  Statistical design and analysis by SAGI were used by all projects at managed environment facilities.
	All Australian wheat breeders collaborate with SAGI to implement advanced biometric methods within their breeding programs.	Achieved. All wheat-breeding programs interacted with SAGI through NVT.



Table 4 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<p>Growers and their advisers have greater access to and make greater use of accurate, regionally relevant yield potential and stability data to choose an improved variety.</p> <p><i>Key metric:</i></p> <ul style="list-style-type: none"> <li><i>New varieties currently available meet the expectations of at least 60% of growers.</i></li> <li><i>40% of growers and their advisers use the NVT online data or attend an NVT field day, and of these 90% consider that the information obtained helped them in deciding which varieties to plant.</i></li> </ul>	<p>The GRDC Grower Survey shows continued increases in the proportions of growers who say that:</p> <ul style="list-style-type: none"> <li>new varieties met their expectations well or very well</li> <li>NVT information helped them to choose varieties to adopt.</li> </ul>	<p>Partly achieved. Results of the Grower Survey show that:</p> <ul style="list-style-type: none"> <li>the proportion of growers who said that new varieties met their expectations well or very well was stable, at 79% in 2016 and 2017</li> <li>the proportion of all growers who accessed NVT information and said that it helped them to choose varieties increased from 41% in 2014 to 46% in 2016.</li> </ul> <p><i>Achieved. The 2017 Grower Survey shows that 79% of growers agree that new varieties meet their expectations. The 2016 Grower Survey shows that 48% of growers use NVT data or visit NVT field days and, of those, 95% find that NVT information assists their decisions on varieties to plant.</i></p>

Note: Survey results are derived from the most recent survey in which the target was measured.

## Theme 3—Protecting your crop

This theme aims to develop cost-effective control options that prevent pests, weeds and diseases from causing crop yield and quality losses, and increase growers' profit.

Existing control measures for pests, weeds and diseases require ongoing review in the light of:

- potential and actual incursions of exotic pests
- changes in regulation of pesticide use and access
- the need to
  - reduce the cost and increase the speed of delivery of resistant and tolerant varieties
  - manage herbicide and pesticide resistance
  - provide ongoing stewardship of gene technology and pesticide products to support long-term access.

The 'Protecting your crop' theme develops the cultural, chemical and genetic options available to manage key pests, weeds and diseases in each region. Management options need to take into account cost-effectiveness, resilience of control strategies and flexibility to fit different farming systems.

### Aspirational outcome

Australian grain growers managing their farms to maximise profit and reduce risk by adopting effective, sustainable and efficient control of weeds, pests and diseases

RD&E	PROJECTS	INVESTMENT
New	38	\$12.91m
Ongoing	71	\$40.95m
<b>Total</b>	<b>109</b>	<b>\$53.86m</b>

## Investment highlight—Managing impacts of Russian wheat aphid

Russian wheat aphid (RWA) is one of the world's most economically important pests of cereal grain. First identified in Australia in 2016, it has spread across the major cropping regions of South Australia and Victoria, and parts of southern New South Wales and Tasmania.

The Australian grains industry is focused on minimising the pest's spread and impact on crops, through integrated control strategies based on local risk.

To help the industry develop the knowledge and management tools to underpin those strategies, the GRDC has invested in research in relation to:

- insecticide sprays—Trials have been conducted across a range of environments, investigating how factors such as temperature, spray volume and quality, and use of adjuvants affect the relative effectiveness of common insecticides, insecticide dose responses, natural enemies of RWA, and crop safety and yield.
- insecticide seed treatments—Preliminary trials, supported by observations from growers and advisers, have indicated that seed treatments currently registered to control cereal aphids are likely to be effective in controlling RWA.

- genetic resistance—Experimental work has been completed to assess the biotype/s of RWA now present in Australia, to assist breeders in identifying sources of genetic resistance that might be effective in RWA control. The work has identified that there is only one likely biotype and that sources of resistance are presently available in Australia for breeding. Screening of current varieties in glasshouse trials has indicated that there may be some genetic differences in how those varieties respond to RWA. A significant amount of further work is required to repeat glasshouse screening alongside field work to assess yield losses and provide reliable resistance ratings for growers.
- biology and ecology—RWA populations are being closely monitored at 16 locations, to provide data to support investigations of the relationships between crop stage, crop symptoms, pest numbers, parasitoid and predator populations, and yield impacts.
- knowledge and extension—A review of international literature has been conducted to identify knowledge gaps and information relevant to Australian growing conditions. Information on RWA management, including the Find, Identify, Threshold Approach, Enact (FITE) strategy, is being delivered to growers and advisers through a range of communications products and activities, including GRDC updates.

The work so far shows that RWA can be managed, through an integrated approach that employs agronomic tactics, encourages the prevalence of natural enemies, and incorporates the strategic use of insecticides.



## Theme performance

Table 5 details the results of Theme 3 against the planned outcomes of the Strategic R&D Plan 2012–17 and targets of the Annual Operational Plan 2016–17.

Table 5: Theme 3 performance against GRDC strategic measures

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Effective, sustainable and efficient management of weeds</b> <b>Effective, sustainable and efficient management of vertebrate and invertebrate pests</b> <b>Effective, sustainable and efficient management of cereal rusts</b> <b>Effective, sustainable and efficient management of cereal (non-rust), pulse and oilseed fungal pathogens</b> <b>Effective, sustainable and efficient management of nematodes</b> <b>Effective, sustainable and efficient management of viruses and bacteria</b>		
A greater proportion of growers and their advisers monitor crops for pests, weeds and diseases.	Regular monitoring of weeds, insects, snails and slugs and diseases, and targeted monitoring of red-legged earth mite and glyphosate-resistant weeds, are conducted in each region.	Achieved. Biotic threats to grains production were monitored and reported to growers. Herbicide-resistant weeds are monitored on a five-yearly basis, with additional, more frequent checks for glyphosate-resistant weeds.
Breeders and pre-breeders use available genetic diversity for resistance and tolerance breeding.	New herbicide-tolerant chickpea and field pea varieties are available to growers.	Achieved. The newly commercialised field pea variety OZP1101 maintains higher tolerance to Metribuzin products (e.g. Lexone®) than comparator varieties Kaspal <sup>®</sup> and PBA Gunyah <sup>®</sup> . The newly released chickpea variety PBA Seamer <sup>®</sup> has higher tolerance to Isoxaflutole products (e.g. Balance®) when compared to the industry benchmark variety Yorker <sup>®</sup> .
	Breeders have access to markers to select for greater tolerance to crown rot in barley.	Partly achieved. Molecular markers for two loci conferring partial resistance to crown rot were developed and will be validated against field results and made available to breeders in 2017.
Growers and their advisers cost-effectively manage pests, weeds and diseases.	The adoption of harvest weed seed management has increased by 50% in the Northern and Southern regions.	Partly achieved. Awareness of the available techniques and tools for harvest weed seed control, and their effectiveness, increased among growers in the Northern and Southern regions.
	Improved knowledge of the biology and ecology of snails and slugs allows growers to better target management tactics, including chemical, physical and biological control methods.	Achieved. Greater understanding of snail behaviour in different farming systems was achieved through in-field video monitoring. The information is being used to improve snail management tactics.



Table 5 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<p>A greater proportion of growers and their advisers use practices to increase pesticide longevity and reduce the risk of resistance.</p> <p><i>Key metric: More than 70% of growers are aware of integrated weed, pest or disease management practices, and 50% use some form of integrated management methods on their farm.</i></p>	<p>The GRDC 2017 Grower Survey shows increases in the proportions of growers who say that they have:</p> <ul style="list-style-type: none"> <li>heard of integrated management practices for weeds, pests or diseases</li> <li>adopted integrated management practices on their farms.</li> </ul>	<p>Partly achieved. Between the Grower Surveys conducted in 2014 and 2017, the proportion of growers aware of integrated management practices increased, but the proportion of growers using such practices decreased.</p> <p><i>Achieved. The 2017 Grower Survey shows that:</i></p> <ul style="list-style-type: none"> <li><i>83% of growers are aware of integrated weed management and 72% practise it</i></li> <li><i>80% of growers are aware of integrated pest management and 59% practise it</i></li> <li><i>70% of growers are aware of integrated disease management and 55% practise it.</i></li> </ul>
<b>Biosecurity and pesticide stewardship</b>		
<p>A greater proportion of growers and their advisers use surveillance and biosecurity measures to manage and prepare for incursion and containment of exotic plant pests, plants and diseases.</p> <p><i>Key metric: At least 50% of growers undertake on-farm practices to maintain or improve their biosecurity.</i></p>	<p>The GRDC 2017 Grower Survey shows an increase in the proportion of growers or advisers who say that they have used surveillance and biosecurity measures to manage and prepare for incursion and containment of exotic plant pests, plants and diseases.</p>	<p>Achieved. Between the Grower Surveys conducted in 2014 and 2017, the proportion of growers undertaking on-farm practices to maintain or improve biosecurity increased by 34 percentage points.</p> <p><i>Achieved. The 2017 Grower Survey shows that 87% of growers undertake on-farm practices to maintain or improve biosecurity.</i></p>
<p>Breeders and pre-breeders use available genetic diversity to deliver varieties resistant to high-risk biosecurity threats.</p>	<p>Current Australian germplasm is assessed for tolerance to wheat blast.</p>	<p>Achieved. A wheat blast contingency plan has been developed, and 20 elite wheat cultivars are being assessed (in Bolivia) for resistance status.</p>
<p>A greater proportion of growers and their advisers manage stewardship of pesticides and varieties to prolong pesticide effectiveness and ensure safety to health and the environment.</p> <p><i>Key metric: 90% of growers undertake activities to delay the onset of or manage herbicide resistance in weed populations.</i></p>	<p>The GRDC 2017 Grower Survey shows an increase in the proportion of growers who say that they have undertaken activities to delay the onset of or manage herbicide resistance in weed populations.</p>	<p>Achievement was not measured in the 2017 Grower Survey. The 2016 Farm Practices Survey shows that nationally 16% of the farm area is affected by herbicide-resistant weeds and 20% of the cropped area is planted using weed management techniques.</p> <p><i>Achieved. The 2016 Grower Survey shows that the proportion of growers taking action to delay herbicide resistance is 93%.</i></p>

Note: Survey results are derived from the most recent survey in which the target was measured.



# Theme 4—Advancing profitable farming systems

This theme aims to provide growers and their advisers with the tools to design and manage a farming system with the flexibility to adapt and respond; manage risk; and generate profit.

The 'Advancing profitable farming systems' theme:

- ensures that research results from the other themes are integrated on farm
- undertakes production agronomy research for systems development
- provides an important conduit for identifying on-farm production constraints and opportunities to inform activities in other themes.

The investment strategies for this theme differ across agroecological zones and farming systems, and are a combination of:

- applied farming systems research to overcome major, widespread regional constraints
- short-term development and extension activities to improve technologies or practices for a target group of growers in an agroecological zone.

## Aspirational outcome

Australian grain growers managing farming systems that are able to respond and adapt to changing environmental and market conditions to reduce risk and deliver an increase in profitability

RD&E	PROJECTS	INVESTMENT
New	56	\$17.33
Ongoing	93	\$21.91
<b>Total</b>	<b>149</b>	<b>\$39.24m</b>

## Investment highlight— Optimising deep placement of nutrients

Across the Northern Region, macronutrient balances are negative—more nitrogen, phosphorus, potassium and sulphur are being removed than are being applied. This depletion of the soil resource base, particularly in the subsoil, heightens the need for grain growers to apply fertiliser as effectively as possible.

Crop nutrient requirements are largely met by root extraction from soil layers below 10 centimetres. For nutrients that are immobile in the soil, such as phosphorus, traditional methods of applying fertiliser in the surface layer (at 5–10 centimetres) do not deliver plant available nutrients where they are most needed.

Placing phosphorus deeper in the soil (at 15–25 centimetres) has been shown to substantially increase crop growth and grain yield. However, deep placement of fertiliser can require specialised equipment and cause significant soil disturbance.

Growers require evidence-based guidance on the methods, costs and benefits of deep placement to shape management strategies for immobile nutrients that are compatible with their broader nutrient management objectives.

The GRDC is investing in research to examine:

- the economics of deep placement
- engineering innovations needed to achieve deep placement at low cost
- the relative efficacy of particular fertiliser products and formulations
- crop responses to the timing, rate and band spacing of deep-placed nutrients.

Field trials in Queensland and northern New South Wales are currently looking at the soil enrichment effects of various combinations of nutrient application rate and band spacing, and the impact on crop nutrient uptake of co-locating nitrogen, phosphorus and potassium. The researchers are also testing a new approach to calculating plant uptake of phosphorus and potassium.

Further work will include:

- assessing the value of applying zinc with phosphorus
- comparing the effects of various fertiliser products—such as triple superphosphate, monoammonium phosphate and diammonium phosphate—and liquid and granular fertiliser formulations
- testing the impacts of various fertiliser rigs, including high-pressure liquid injection, discs, tines and strip tillage equipment.

The findings will be used to develop a decision support framework that assists growers and advisers to determine whether deep placement is required, take risk factors into account, and choose the most appropriate machinery and fertiliser products for their cropping systems.



## Theme performance

Table 6 details the results of Theme 4 against the planned outcomes of the Strategic R&D Plan 2012–17 and targets of the Annual Operational Plan 2016–17.

Table 6: Theme 4 performance against GRDC strategic measures

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Knowing what is important (key business drivers)</b>		
Information is available in each GRDC agroecological zone about the main opportunities, constraints, and risks to farming systems.  <i>Key metric: The GRDC receives information at least annually via the regional panels.</i>	Key issues and information gaps are identified.	Achieved. Investments included funding for coordination and facilitation services for the GRDC's Regional Cropping Solutions networks and a report on issues of importance to southern New South Wales.  <i>Achieved. The GRDC regularly receives information from growers and advisers through the regional panels and Regional Cropping Solutions networks.</i>
Data is also available in each zone about how whole-farm and farming system decisions affect those opportunities, constraints and risks.	Technical data combined with profit drivers provides information to growers for informed decision making.	Achieved. More than 300 'whole-of-business' data sets were analysed and reports were published on: <ul style="list-style-type: none"> <li>• key profit drivers for each agroecological zone</li> <li>• effects of the use of decision support tools and technical information</li> <li>• potential trade-offs from increasing the scale and precision use of inputs.</li> </ul>
	Published benchmarks allow growers to compare wheat yield to crop nitrogen status, to determine the size of yield gaps and measure the nitrogen status of crops as affected by sowing date, fertilisation and variety.	Partly achieved. Trials are continuing and results from the 2016 season have been analysed against 2015 results. Benchmarks have not yet been published.
Better methods and tools are developed for comparison and ranking of the impacts of opportunities and risks on farm profit and sustainability, both short and long term.	Data is available quantifying the nitrogen status of 15 wheat varieties at two National Variety Trials (NVT) sites in South Australia.	Partly achieved. Trials have been carried out at Hart Field Site, NVT sites and grower paddocks in South Australia. Benchmarks have not yet been published.
A greater proportion of growers and their advisers use information and tools to identify and rank constraints and opportunities to increase profit.  <i>Key metric: 70% of growers place a high importance on the use of decision tools to assist them with strategic or tactical decision making.</i>	Growers are able to quantify the gaps between potential and actual yields for wheat at the statistical local area scale and for different decile years.	Achieved. The Yield Gap Australia website provided an interactive tool for estimating potential yields for wheat and canola at the statistical local area scale.  <i>Achieved. The 2017 Grower Survey shows that 79% of growers place a high importance on using decision support tools.</i>



Table 6 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Planning strategically (building system benefits and rotations)</b>		
A greater proportion of growers and their advisers are aware of the actual and potential impacts of their management on their farming systems across seasons and across the farm, based on regionally validated data as well as their own records.	The capacity of growers and consultants to characterise soils for plant available water content and measure soil water availability is increased.	Not achieved. This investment did not proceed in 2016–17.
	Research, development and extension work related to stubble-retained farming systems in south-eastern Australia is collated and analysed.	Achieved. A series of regional guidelines was published to assist growers to deal with high stubble loads from the 2016–17 harvest.
Growers implement long-term, strategic plans to take advantage of identified opportunities, manage constraints and reduce risks, while retaining flexibility to respond to unforeseen events.  <i>Key metric: More than 25% of growers have developed a whole-farm business plan which takes account of strategic opportunities, constraints and risks.</i>	Increased numbers of growers are optimising their cropping systems in response to both opportunities and constraints.	Achieved. The GRDC released a research update on continuous cropping systems and published a <i>GroundCover</i> supplement on the integration of livestock and cropping systems.  <i>Achieved. The 2016 Grower Survey shows that 29% of growers have a whole-farm business strategic plan.</i>
Effective management practices for opportunities, constraints and risks are developed, validated and demonstrated in each agroecological zone.	Strategic decisions and practices are tested, validated and demonstrated in each agroecological zone, and captured in regionally relevant publications on best management practice.	Achieved. The GRDC published: <ul style="list-style-type: none"> <li>• regional soil testing guidelines and updated nutrient response curves for the Northern and Southern regions</li> <li>• regional soil testing and nutrient guidelines for the Western Region.</li> </ul>
<b>Responding tactically (individual crop agronomy)</b>		
An increased proportion of growers use crop-specific best management practices to optimise their tactical (within season) agronomy for each individual crop.	Growers have access to regionally relevant publications on best management practice.	Achieved. Case studies were published on topics including novel techniques to utilise available moisture; rotations and break crops; variable rate technology; and lime trials.
	Technical guidelines for canola growers in all commonly experienced grain-growing environments of Western Australia have been developed and relevant fact sheets have been published.	Achieved. NVT results and a grower update on agronomy for early-sown canola were published, and a podcast on the viability of hybrid canola in low-rainfall areas was released.

Table 6 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
Growers use improved strategies to cost-effectively acquire crop inputs.	Best practice guidelines and locally relevant variety-specific agronomy packages for wheat and canola in southern irrigated cropping systems have been developed and published.	Achieved. The GRDC delivered: <ul style="list-style-type: none"> <li>• variety-specific agronomy packages for New South Wales</li> <li>• a <i>GroundCover</i> supplement investigating barriers to achieving consistent 10 tonne per hectare yields for irrigated wheat in south-eastern Australia</li> <li>• a grower update on achieving 10 tonnes per hectare of irrigated wheat and 4 tonnes per hectare of canola in the Murrumbidgee Valley region.</li> </ul>

Note: This table corrects some errors in targets published for this theme in Table 4 of the Annual Operational Plan 2016–17. Survey results are derived from the most recent survey in which the target was measured.



# Theme 5—Improving your farm resource base

This theme is focused on protecting and enhancing the farm’s soil, water, habitat and atmospheric resources to maintain production performance under a variable climate and to demonstrate to consumers and the wider community the sustainable nature of Australian grains production.

Australian grain growers operate in a variable climate and will be significantly affected by climate change. In addition, growers will need to react to Australian Government and international policies, programs and market expectations set in response to climate change—for example, in relation to greenhouse gas emissions.

These impacts need to be understood so that the industry can minimise risk and maximise opportunities. The issues of climate variability and change need to be factored into both seasonal and longer term farm business decisions.

Within the context of a changing climate, soil, water, habitat and atmospheric resources need to be improved across the environment in which the industry operates. Soil carbon is declining in many grains catchments, as is soil pH. Although water consumption by agriculture is being reduced and becoming more efficient, water quality in some key catchments requires further management. Native vegetation communities have become highly fragmented, affecting both biodiversity balance and the potential for exploitation as habitat for beneficial organisms.

In addition, as consumers are becoming more interested in how the food they buy is produced, the grains industry needs to be able to communicate its commitment to good stewardship. The ‘Improving your farm resource base’ theme will assist growers, across the industry and as individual producers, to demonstrate that they are using chemicals and fertiliser wisely and caring for the land.

## Aspirational outcome

Grain growers valued for adopting practices that improve regional habitat, soil, water and atmosphere resources in a changing climate

RD&E	PROJECTS	INVESTMENT
New	16	\$6.07m
Ongoing	26	\$7.85m
<b>Total</b>	<b>42</b>	<b>\$13.92m</b>

## Investment highlight—Improving soil organic matter

Effective management of carbon is vital to the profitability and sustainability of grains production now and in the future.

The GRDC supports a range of projects to educate and equip grain growers to:

- accurately measure soil organic carbon
- identify the functions of soil organic matter, such as improving nutrient supply and soil water-holding capacity
- understand how farming practices affect soil organic matter and the loss of nitrogen through the emission of nitrous oxide
- manage soil organic matter for the benefit of their farm enterprises.

A participatory R&D project involving eight farming groups—one in Tasmania, two each in New South Wales and South Australia, and three in Victoria—concluded in 2016–17. The project focused on increasing the decomposed humus fraction of soil carbon, and involved three years of trials in all eight locations and an additional two years of trials in four locations.

The trials included ‘paired paddock’ demonstrations, highlighting the differences in soil carbon between paddocks with similar soil types but contrasting management regimes for soil organic matter. Farm groups used the results as a basis for discussing the functions of soil organic matter and ways to increase and maintain soil organic matter content.

Participating groups were involved in the development of an extensive communication program of field days, workshops, publications and a website. The communication materials have been made available to farm groups and grain growers not directly linked to the project, and to other interested parties such as natural resource management organisations.

In addition, the project has delivered:

- an increase in the number of farmers and advisers who understand the functions and economic value of soil carbon and have used their knowledge and skills to develop carbon management strategies for their farms
- an improvement in scientific understanding of practical strategies to manage soil carbon, the techniques required for carbon sequestration, and the functions of healthy soils on commercial farms
- baseline data on soil carbon stocks across a range of regions, climatic zones, soils, land uses and farming practices, which may be used in assessing opportunities for soil carbon sequestration.



## Theme performance

Table 7 details the results of Theme 5 against the planned outcomes of the Strategic R&D Plan 2012–17 and targets of the Annual Operational Plan 2016–17.

Table 7: Theme 5 performance against GRDC strategic measures

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Understanding and adapting to climate variability</b>		
Growers integrate weather data with other resource inputs to predict, plan and assess farm performance.	Growers factor into their long-term planning the potential effects of climate change.	Achieved. The 2017 Grower Survey shows that 70% of growers have changed practices in the past five years as a result of seasonal/ weather conditions.
Growers use improved seasonal forecasts and tools to manage their farm business in response to climate variability.	A range of farming system options to respond to climate variability and change are developed and tested for each major grain-growing region.	Partly achieved. Break crops, pasture legumes and dual-purpose wheats provide options for variable climates. No-till, stubble retention and soil mitigation/amelioration practices provide options for dry conditions.
Growers seek information about the possible impacts of long-term climate changes on crop growth patterns and adopt enterprise and crop decisions and agronomic practices required to optimise profit and manage risk.  <i>Key metric: 60% of growers consider the potential effects of climate change on their farm business when making long-term decisions.</i>	Increased number of growers use seasonal forecasts, local climate data and decision tools to help predict and plan likely crop and farming system performance, and in their tactical (seasonal) decisions.	Achieved. Between the Grower Surveys conducted in 2014 and 2016, the proportion of growers adopting management practices to manage climate variability or climate changed increased by seven percentage points.  <i>Achieved. The 2016 Grower Survey shows that 66% of growers have adopted new management practices to manage climate variability or climate change.</i>
Growers seek information about potential mitigation strategies to reduce on-farm greenhouse gas emissions, and adopt them where feasible.	Increased number of growers are aware of their farms' greenhouse gas emissions profiles and are adopting appropriate mitigation strategies.	Partly achieved. Progress was made on increasing growers' awareness of their farms' emissions and the impacts of elevated carbon dioxide, and on determining mitigation strategies.
Researchers incorporate farm-scale data in the improvement of climate and weather modelling.	On-farm weather data is provided to the Bureau of Meteorology, especially in Western Australia.	Achieved. As part of the Managing Climate Variability program, farmers interacted with researchers to improve climate research and forecasting. On-farm data was used to improve modelling.



Table 7 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Improving soil health</b>		
<p>Growers adopt agronomic practices that improve the chemical, physical and biological health of the soil for sustained productivity.</p> <p><i>Key metric: 70% or more of growers undertake activities to improve the condition and productive capacity of their soils.</i></p>	<p>Increased number of growers regularly measure the health (productive capacity) of their soils and incorporate the information into their land use and cropping decisions.</p>	<p>Achieved. Between the Grower Surveys conducted in 2014 and 2017, the proportion of growers undertaking activities to improve their soils increased by four percentage points.</p> <p><i>Achieved. The 2017 Grower Survey shows that 98% of growers undertake activities to improve the condition and productive capacity of their soils.</i></p>
<p>Growers understand and manage the impact of farming practices on soil health in order to maintain or increase productive potential.</p> <p>Growers increase the extent and quality of ground cover to improve soil health and minimise loss.</p>	<p>Growers are aware of and are adopting management practices that will maintain and improve their soils' productive capacity and minimise losses due to erosion.</p> <p>Increased proportion of growers retain crop residues and other forms of ground cover.</p>	<p>Achieved. The 2016 Farm Practices Survey shows that of the total cropped area:</p> <ul style="list-style-type: none"> <li>the average area planted with zero tillage or no tillage increased to 74%</li> <li>the area of stubble retained through to planting increased to 49%</li> <li>the area on which controlled traffic was used increased to 29%.</li> </ul>
<b>Managing water use on dryland and irrigated grain farms</b>		
<p>Growers manage water quantity and quality on farm to improve efficiency of water use.</p>	<p>Increased number of growers regularly measure soil moisture to set target yields and determine optimum levels of crop inputs (including irrigation water).</p>	<p>Not achieved. The 2016 Farm Practices Survey shows that:</p> <ul style="list-style-type: none"> <li>plant available water was assessed prior to planting on 43% of cropped area, a decrease from 58% in 2014</li> <li>soil moisture was assessed during the crop period on 25% of cropped area, a decrease from 34% in 2014.</li> </ul>
<p>Growers implement appropriate and efficient practices that minimise adverse impacts on surface and groundwater quality leaving the farm.</p> <p><i>Key metric: At least 65% of growers use nutrient budgeting to better match application with anticipated crop needs.</i></p>	<p>Increased number of growers assess groundwater levels to avoid the risks of waterlogging and salinity.</p> <p>Increased number of growers test the quality of water used on farm (including for stock or for spraying) and of water leaving the farm.</p>	<p>Achievement was not measured in the 2017 Grower Survey. The GRDC is reviewing the target and the survey question in favour of other measures of on-farm environmental practices.</p> <p><i>Achieved. The 2014 Grower Survey shows that 68% of growers use nutrient budgeting.</i></p>



Table 7 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Understanding and valuing biodiversity</b>		
Growers and their advisers recognise the potential benefits of biodiversity in the landscape to their farming systems.	Growers develop and adopt vegetation management plans for their farms to assist crop production (e.g. through maintaining beneficial insects or using windbreaks), or to access additional sources of farm income (e.g. from agroforestry or carbon farming).	Achieved. The 2016 Farm Practices Survey shows that: <ul style="list-style-type: none"> <li>the proportion of farms with a vegetation plan increased to 39% nationally, from 35% in 2014</li> <li>80% of growers who have a vegetation management plan do so to conserve an area of native vegetation for biodiversity or amenity benefit.</li> </ul>
Growers understand the likely effects of alternative land use decisions based on sound data, and use this to make assessments of land capability and use.	Growers use vegetation plans to assist in identifying and conserving areas of native vegetation important for local or regional biodiversity, production benefits, or farm amenity.	
Growers integrate the management of vegetation with high biodiversity value to meet farm business objectives (e.g. managing frost, providing shelter, accessing emerging carbon markets, managing salinity, applying area-wide integrated pest management or maintaining lifestyle objectives/ farm aesthetics).		
<b>Communication of sustainable production methods</b>		
Growers recognise themselves as sustainable food producers rather than bulk commodity producers.	Increased number of growers adopt quality assurance, environmental management systems or other stewardship approaches to assist them in meeting market requirements, enhance their recognition as producers of quality products, and meet community expectations of sustainable land use.	Not achieved. The 2016 Farm Practices Survey shows that the proportion of farms that have a quality assurance or environmental management program remained unchanged since 2014, at 17%.
Growers communicate their responsible use of farm inputs and the natural resource base to the broader community.		
Growers understand, calculate and communicate the carbon and water footprint of the products they produce.	Growers are aware of and actively participate in catchment management plans and programs.	Information from research adoption and extension providers indicates that growers are participating in catchment management programs.

Note: Survey results are derived from the most recent survey in which the target was measured.



# Theme 6—Building skills and capacity

This theme is focused on generating leadership, innovation and education in the grains sector.

To compete and succeed internationally, the Australian grains industry needs a highly skilled and motivated workforce, including growers, advisers, researchers and managers.

The industry has identified several critical challenges:

- the grains industry and farming are becoming increasingly complex, with many types and sources of information that growers need to make decisions
- the number of appropriately skilled researchers and advisers being trained to replace the current generation is inadequate—this is compounded by a large number of experienced people reaching retirement age
- agricultural careers are not traditionally attractive to potential candidates
- the grains industry lacks a whole-of-industry approach to building skills and capacity
- growers are time poor and face succession-planning changes
- the uptake of technology often requires substantial technical support.

Through the 'Building skills and capacity' theme, the GRDC has identified opportunities to focus its investment to address these challenges.

## Aspirational outcome

A dynamic Australian grains industry with the skills and capacity to continuously innovate

RD&E	PROJECTS	INVESTMENT
New	33	\$0.83m
Ongoing	58	\$5.86m
<b>Total</b>	<b>91</b>	<b>\$6.69m</b>



Nuffield Australia scholars: Katrina Sasse, Luke Bradley, Alexander Nixon. Photos: Carl Saville

## Investment highlight—Supporting Nuffield Australia Farming Scholars

In association with the Nuffield Australia Farming Scholars Association, the GRDC invests in scholarships to develop leadership skills and build capability in world's best practice for the Australian grains industry.

Nuffield Australia Farming Scholarships support primary producers to travel overseas to study research topics relevant to their farming operations. As well as practical farming knowledge, the scholars gain a better understanding of the forces shaping international trade and technological advances being made overseas.

Each GRDC scholar undertakes a six-week study tour, investigating marketing, trade and environmental issues within different cultural and social settings. The tours, and events such as the Contemporary Scholars Conference, provide opportunities to build networks within the grains industry and agriculture more broadly.

The scholars share their learning by producing written reports; attending GRDC updates and other events; mentoring growers and advisers through GRDC-supported programs; and taking part in media coverage, including social media.

In 2017, the GRDC funded three scholars to research diverse topics related to the profitability and sustainability of Australian grains.

Luke Bradley is researching world's best practice in precision agriculture. His interests include:

- using existing knowledge and data more effectively
- simplifying the use of and results from new technologies

- building a database from one farm to the next, as site-specific data can provide different insights to general research
- making live data available to enable timely and relevant on-farm decision making.

Alexander Nixon is researching ways to make broadacre farming more sustainable, with a focus on soil health. His interests include:

- preventing degradation of soil structure, moisture loss, erosion, topsoil depletion and compaction
- improving organic carbon levels in the soil in a sustainable, cost-effective and efficient manner
- comparing soil management practices in broadacre farming businesses in Australia and the United States.

Katrina Sasse is researching strategies to encourage young women, particularly farmers' daughters, to play an integral role in farm businesses. Her interests include:

- increasing the engagement of daughters in family farm succession planning
- promoting female role models for young women in agriculture
- encouraging a gender balance on farms and in rural organisations
- identifying opportunities, on and off farm, to attract women into farm businesses.



## Theme performance

Table 8 details the results of Theme 6 against the planned outcomes of the Strategic R&D Plan 2012–17 and targets of the Annual Operational Plan 2016–17.

Table 8: Theme 6 performance against GRDC strategic measures

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<b>Grains industry leadership and communication</b>		
<p>An increased number of industry participants are engaged in regional and national leadership roles in the Australian grains industry.</p> <p><i>Key metric: At least three Nuffield scholars are from the grains industry each year.</i></p>	<p>Leadership positions within the grains industry can be filled with minimal delay by candidates who have the skills, knowledge and experience required.</p>	<p>Achieved. New industry leaders were developed through programs such as Nuffield Australia Farming Scholarships, the GRDC Emerging Leader Award and the Australian Rural Leadership Program.</p> <p><i>Achieved. The GRDC supported three Nuffield scholars.</i></p>
<p>The grains industry communicates information about potential career opportunities to secondary and tertiary students and their parents and career advisers.</p>	<p>The GRDC invests in projects, targeted at students, that promote careers in the grains industry.</p>	<p>Achieved. Projects included:</p> <ul style="list-style-type: none"> <li>• CSIRO Plant Industry Summer Student Program</li> <li>• Hermitage Research Facility Schools Plant Science Competition</li> <li>• Seed to Store</li> <li>• Art4Agriculture</li> <li>• Science and Innovation Awards for Young People in Agriculture</li> <li>• AgSkilled</li> <li>• People in Agriculture.</li> </ul>
<p>The grains industry publicises how it benefits the wider community.</p>	<p>The GRDC publishes articles that promote the role and importance of the grains industry.</p>	<p>Achieved. The 2017 Grower Survey shows that 63% of growers rate the GRDC fairly to very highly for investing in activities for the public good, an increase from 58% in 2015.</p>
<b>Capacity building in the extension sector</b>		
<p>The extension sector collates and publishes annually its skills requirements and identifies gaps and potential gaps in discipline areas.</p>	<p>The extension sector regularly communicates its training requirements for skilled personnel, including any gaps in discipline areas.</p>	<p>Achieved. While the GRDC continues to deliver general support for this goal through activities across its research, development and extension (RD&amp;E) portfolio, this goal is now serviced by other providers.</p>
<p>Increased number of people enrol in targeted agriculture-related disciplines.</p>	<p>The GRDC invests in projects to support students undertaking agriculture-related study.</p>	<p>Achieved. Projects included:</p> <ul style="list-style-type: none"> <li>• Agricultural Training Awards</li> <li>• Horizon Scholarships</li> <li>• Extension Adoption Training and Support Program</li> <li>• AgSkilled.</li> </ul> <p>Numbers of applicants for postgraduate and undergraduate scholarships increased.</p>



Table 8 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
Increased number of qualified graduates are employed in extension roles.	The grains industry has access to suitably qualified and experienced extension personnel.	<p>Achieved. Development programs for agronomists were conducted in areas such as:</p> <ul style="list-style-type: none"> <li>• providing advice on production and crop protection</li> <li>• increasing regionally based knowledge</li> <li>• improving the adoption of research outputs</li> <li>• building research capacity and planning for succession.</li> </ul> <p>Courses for farm consultants were also conducted in priority areas such as integrated weed management, grain storage and farm business management.</p>
Increased number of graduates and other extension staff undertake postgraduate/workplace training.	Increased number of undergraduates successfully complete agriculture-related courses.	Achieved. Projects such as Undergraduate Honours Scholarships and traineeships in applied grains research provided intensive placements for students with grower groups, agribusinesses and research institutes.
Career pathways within the extension sector retain skilled and experienced personnel.	The proportion of people in the extension sector with relevant graduate and postgraduate qualifications is increasing.	Achievement was not measured in 2016–17.
<b>Capacity building in the R&amp;D sector</b>		
The grains industry has a clear understanding of its skills requirements in the short, medium and long terms.	The GRDC, in collaboration with RD&E providers, regularly communicates its anticipated future requirements for skilled personnel.	Achieved. 25 postgraduate and undergraduate scholarships were awarded, addressing GRDC research priorities. Work to identify capacity gaps in relation to future investment strategies was completed.
Training providers address the grains industry RD&E skills gaps in innovative and flexible ways.		
RD&E providers work with the grains industry to develop improved measures of RD&E performance.	The grains industry and RD&E providers are maintaining or increasing the skills and capacity available, in line with the <i>Grains Industry National Research, Development and Extension Strategy</i> .	Achieved. 44 PhD Grains Research Scholarships and 12 Undergraduate Honours Scholarships were granted, in addition to GRDC project-supported PhD students. A partnership to build research capacity and aid succession planning was formed with the Grains Industry Association of Western Australia.
<b>Capacity building for grain growers</b>		
Growers recognise the additional knowledge and skills they need to fully understand, adapt and adopt the outputs of RD&E and optimise their benefits.	Increased number of growers regularly use the support of skilled advisers to assist with cropping and business decisions.	Achieved. The 2017 Grower Survey shows that 57% of growers use a paid agronomist or adviser to assist with cropping decisions, an increase from 50% in 2016.

Table 8 (continued)

PRACTICE CHANGES AND KEY METRICS	TARGETS	RESULTS
<p>Growers and their advisers participate in relevant training and skills development and apply the knowledge gained to on-farm decisions and practices.</p> <p><i>Key metric: At least 75% of growers and advisers undertake at least one activity each year to learn more about opportunities to improve farm profit or sustainability.</i></p>	<p>Growers and advisers attend GRDC-supported training courses to increase their knowledge.</p>	<p>Achieved. The 2016 Products and Services Survey shows that growers and advisers participate in GRDC extension activities.</p> <p><i>Achieved. The 2017 Grower Survey shows that 85% of growers have undertaken at least one learning activity in the past year.</i></p>
<p>Growers apply skills on farm to increase profitability and sustainability.</p>	<p>The GRDC Grower Survey indicates that growers intend to change practices on farm as a result of training and skills development.</p>	<p>Achieved. The 2017 Grower Survey shows that 68% of growers have made on-farm practice changes and 56% of those growers say that the changes were stimulated by GRDC information and training programs.</p>

Note: Survey results are derived from the most recent survey in which the target was measured.



# Portfolio management

The GRDC's six strategic themes for RD&E investment align with the GRDC's purpose and reflect government and industry objectives. Investment priorities cover incremental through to transformational improvements in profitability drivers for the grains industry.

## Portfolio

Each individual investment provides a balanced mixture of work to discover new opportunities to improve profitability, and work to maximise adoption of those opportunities. Without adoption, the impact of R&D on profit would be limited.

In delivering a balanced portfolio, the GRDC considers:

- short-, medium- and long-term investments that address industry priorities as well as government research and innovation priorities
- research needs across all cropping systems and coarse grain, legume and oilseed crops
- the spread of benefits across Australia's grain-growing regions
- ways to increase capacity and capability among growers, advisers and research partners
- the balance of incremental, step change and transformational investments.

The GRDC's RD&E investment portfolio in 2016–17 included more than 560 projects at various stages of development.

## Impact assessment

The GRDC regularly assesses the impact of its investments under guidelines released by the Council of Rural Research and Development Corporations in 2014. The analyses are undertaken by the GRDC and external organisations.

The portfolio is grouped into eight categories: one each for the six strategic themes; one for foundational activities, such as reviews and impact assessments; and one for investments in R&D management. This enables groups of projects that support an investment strategy within a theme to be analysed together.

The criteria for impact assessments include analysis of financial benefits and costs. The results of the financial analyses of the five groups of projects assessed in 2016–17 are shown in Table 9.

The assessments also consider broader economic, environmental and social benefits arising from the project groups, although not all benefits are quantified for formal analysis. Those findings are summarised in Table 10.

Table 9: Financial results of impact assessments

PROJECT GROUP	PRESENT VALUE OF BENEFITS <sup>a</sup> (\$M)	PRESENT VALUE OF COSTS (\$M)	NET PRESENT VALUE (\$M)	BENEFIT: COST RATIO	INTERNAL RATE OF RETURN (%)
Lupin breeding for Australia	11.5	2.8	8.7	4.2	24
Genetic options for nematode control	30.5	2.9	27.6	10.6	34
Northern Region high-yielding cereal agronomy—New South Wales	16.4	0.6	15.7	26.7	79
PBA Australian faba bean breeding program	14.0	6.0	8.0	2.3	29
Measuring and managing soil water in Australian agriculture	20.2	1.8	18.3	10.7	69

<sup>a</sup> Present value of benefits = the discounted value of benefits delivered by the projects. The stream of benefits is accrued over a period of 25 years, commencing from the final year of investment, using a discount rate of 5% per year.



Table 10: Economic, environmental and social benefits identified by impact assessments

ECONOMIC BENEFIT	ENVIRONMENTAL AND SOCIAL BENEFITS
<b>Lupin breeding for Australia</b>	
<p>One new lupin variety, PBA Jurien<sup>(1)</sup>, has been released, and two other varieties have been recommended for release.</p> <p>New varieties show higher yields than existing varieties.</p> <p>End point royalties provide additional benefits to the GRDC.</p>	<p>The project may contribute to increased adoption of lupins, providing another break crop option for cereal and canola rotations and providing residual fixed nitrogen in the soil for the subsequent non-legume crop.</p> <p>New varieties have good levels of disease resistance, reducing the need for chemical inputs.</p>
<b>Genetic options for nematode control</b>	
<p>Information on <i>Pratylenchus thornei</i> resistant and tolerant breeding lines that out-yield current tolerant cultivars (by up to 6%) and decrease nematode populations has been delivered to Australian breeding companies.</p> <p>The parental lines and management strategies developed by this project have the potential to significantly reduce the impact of root-lesion nematodes on Northern Region farming systems and to reduce the delivery time of resistant and tolerant commercial wheat cultivars.</p> <p>The availability of wheat varieties that are tolerant and resistant to root-lesion nematodes will help to reduce lost revenue for the Australian grains industry (currently estimated at \$123 million for wheat alone). This saving would be achieved with little additional cost to the grower.</p>	<p>Genetic control of nematodes through resistant crop varieties is of great environmental value because it averts the use of toxic nematicides.</p> <p>Resistant crop varieties also reduce the environmental degradation and devaluing of land caused by the build-up of high nematode populations in the soil.</p> <p>Healthier crops also suppress weed growth more effectively than those affected by nematode attack.</p>
<b>Northern Region high-yielding cereal agronomy—New South Wales</b>	
<p>Examination of the phenology and sowing time of wheat and sorghum varieties in the north and central west zones of the Northern Region found that:</p> <ul style="list-style-type: none"> <li>• Wheat yield could be increased by 20%, depending on the season, through earlier sowing and timely fertiliser application (although moving to earlier sowing times may increase exposure to frost and heat risks, which need to also be considered).</li> <li>• Sorghum yields could be increased by optimising nutrients, row space and sowing time.</li> </ul>	<p>Optimising sowing time, row space and nutrients for water availability increases revenue potential while minimising input costs.</p>
<b>PBA Australian faba bean breeding program</b>	
<p>Five new faba bean varieties were released under this project, building on work from previous faba bean breeding programs.</p> <p>New varieties show higher, more reliable yields, improving profitability. This has led to an increase in the area of faba bean cultivation.</p> <p>Improved seed quality has improved marketability.</p>	<p>Improved levels of disease resistance reduce the need for inputs and lead to lower management costs.</p> <p>The increase in the area of faba bean cultivation will increase overall biological nitrogen fixation for rotation crops, potentially reducing inputs.</p>



Table 10 (continued)

ECONOMIC BENEFIT	ENVIRONMENTAL AND SOCIAL BENEFITS
<b>Measuring and managing soil water in Australian agriculture</b>	
<p>Increased knowledge of the role of plant available water and a better appreciation of differences in plant available water capacity between soils are expected to lead to increased adoption of yield forecasting by growers.</p> <p>Yield forecasting, consisting of rules of thumb or assisted by tools such as Yield Prophet®, will help to inform management decisions such as the timing of sowing (and associated crop and variety choices) and the level of inputs such as nitrogen fertiliser.</p> <p>Good yield forecasting with seasonal climate forecasts and good agronomy will help to reduce the gap between current and potential grain yields and lead to longer term economic gains.</p>	<p>In the face of a variable and changing climate, better understanding of the soil resource and the use of that knowledge to improve crop management and increase production while adapting to seasonal variability will help to increase the resilience of growers and farming communities.</p> <p>Improved knowledge of available soil water at critical times of the production cycle allows better matching of applied nutrients to water resource availability, reducing the risk of nutrient losses to groundwater or to the atmosphere.</p>

# Commercialisation

In many cases, commercial channels are the most efficient means of delivering the benefits of GRDC research investments to growers. The GRDC's commercialisation strategy consists of:

- analysing returns on investments to ensure that the GRDC is investing in areas that deliver on the GRDC's objective of creating enduring profitability for Australian grain growers
- leveraging capital and expertise from co-investors, to optimise opportunities to bring innovative technology to the marketplace
- managing intellectual property, to protect the GRDC's investments and leverage co-investment
- accessing technologies owned by third parties, for evaluation and use in Australia
- identifying appropriate paths to market for each new technology
- managing the GRDC's commercial investments and partnerships.

Usually the GRDC is only one of a number of public and/or private organisations investing in the development of a new technology. Investment partnerships are desirable and necessary not only from a financial viewpoint, reducing the risk to the GRDC in the funding of new technologies, but also because partner organisations bring benefits such as research capacity, market knowledge, commercial expertise, infrastructure and access to complementary technologies. Partnerships also reduce the GRDC's exposure to risk in funding new technologies.

Where the GRDC is a member of a research collaboration using public and private sector funds, it has influence over the terms of commercialisation, and determines them with the other investors to ensure that all parties achieve their desired outcomes.

## Commercial partnerships

In 2016, integrated weed seed destruction technology developed through GRDC funding at the University of South Australia was licensed to de Bruin Engineering. The first commercial products were released for the 2016–17 harvest.

The GRDC maintained several existing commercial partnerships, such as:

- its strategic partnership with the Crop Science Division of Bayer to discover and develop technologies to manage herbicide-resistant weeds
- its relationship with Nuseed to develop and commercialise varieties
- its commercial R&D partnerships to develop new health products such as canola lines high in omega-3 fatty acids.

## Business relationships

Many of the GRDC's business relationships are governed by research agreements, licence agreements to commercialise resulting intellectual property, and agreements which procure services.

In some cases, the formation of companies and joint venture partnerships (for profit or not for profit) is the most effective way to deliver technologies, services, information and policy advice to Australian grain growers and the wider grains industry.

Table 11 describes the companies in which the GRDC had shares or membership at 30 June 2017. In most cases the GRDC also nominated one or more directors to the company's board.



Table 11: Companies in which the GRDC had shares or membership at 30 June 2017

NAME	ACTIVITY	GRDC ROLE
<b>Companies limited by guarantee</b>		
Australian Crop Accreditation System Ltd ACN 093 984 902	Provides cereal variety details online for farmers and advisers, and manages National Variety Trials.	Is a member of the company and pays the company for services. Nominates a director.
Australian Export Grains Innovation Centre Limited ACN 160 912 032	Provides R&D related to the Australian export grains industry.	Is a member of the company. Nominates a director.
Invasive Animals Ltd ACN 114 965 276	Serves as the IP holding/ management company for the Invasive Animals Cooperative Research Centre.	Is a member of the company. Does not nominate a director.
PB CRC Ltd ACN 115 589 707	Serves as the IP holding/ management company for the Plant Biosecurity Cooperative Research Centre.	Is a member of the company. Does not nominate a director.
Wheat Quality Australia Limited ACN 147 439 656	Manages and delivers the wheat variety classification process.	Is a member of the company and pays the company for services. Nominates a director.
<b>Companies limited by shares</b>		
Australian Grain Technologies Pty Ltd ACN 100 269 930	Undertakes commercial wheat and barley breeding.	Is a 39% shareholder. Nominates three directors.
InterGrain Pty Ltd ACN 128 106 945	Undertakes commercial wheat and barley breeding.	Is a 25% shareholder. Nominates one director.

## New crop varieties

In 2016–17, collaborative breeding programs that received financial support from the GRDC released two new varieties:

- PBA Seamer<sup>®</sup>—an improved desi chickpea variety that is broadly adapted, with improved grain yield in high-disease years and the highest available ascochyta blight resistance rating
- Durack<sup>®</sup>—an improved oat variety launched in 2016 as a candidate milling variety; commercial milling evaluation is being undertaken during 2017 and due for completion in early 2018.

The GRDC collaborates in breeding programs to facilitate the rapid adoption of new, superior varieties by growers, while protecting the interests of the intellectual property owners. In selecting commercial partners, the GRDC and its research partners consider production and communication capabilities and arrangements for the management of end point royalties, including conditions imposed on growers.

In the case of private sector breeding of crops such as wheat and canola, the GRDC has no ownership in new varieties and the responsibility for commercialisation lies with the breeding companies alone. The GRDC is an investor in some private breeding companies.

## Intellectual property

The GRDC usually owns a share of all intellectual property generated by research projects that it funds. This consists of registrable intellectual property (plant breeder's rights, patents and trade marks) and non-registrable intellectual property (copyright and trade secrets).

The GRDC actively manages its intellectual property to:

- ensure that research outcomes are adopted as quickly and effectively as possible, by either dissemination or commercialisation
- provide access to GRDC intellectual property and gain access to third-party intellectual property where it will facilitate the delivery of research outcomes.

The GRDC seeks protection of its intellectual property where to do so will achieve the above objectives, and maintains a register of its registered intellectual property.

### Trade marks and patents

At 30 June 2017, the GRDC held 16 registered trade marks, either in its own right or jointly, and had an interest in 18 patent families.

### Plant breeder's rights

The GRDC's plant breeder's rights portfolio consists of 148 granted certificates and 15 applications, across 21 different crop species.

In 2016–17, the GRDC and its research partners lodged five new applications and surrendered eight certificates. Most of the activity in the GRDC plant breeder's rights portfolio was related to the progression to grant of applications for new varieties released by the Pulse Breeding Australia chickpea, lentil and field pea programs.





Photo: Evan Collis

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# Board

At 30 June 2017, the GRDC Board comprised eight directors.

This section of the annual report provides details of the board members' appointments, qualifications and experience.

The Board has combined expertise in business management; commodity production, processing and marketing; economics; finance; management and conservation of natural resources; environmental and ecological matters; R&D administration; science and technology; technology transfer; communication; and public administration.

## Directors at 30 June 2017



**John Woods**  
BAppSc, MAICD

### Chair (Non-executive)

*Appointed: 8 March 2012 to 30 September 2017*

*Appointed as Chair: 1 October 2016 to 30 September 2019*

*Member: Remuneration Committee (Chair)*

John is partner and manager of a broadacre agribusiness based in northern New South Wales and southern Queensland. He has responsibility for all business aspects, including financial management, production and crop husbandry, marketing and logistics, resource management and work health and safety. He is also Chair of R&R Hire Services in Queensland.

John has a history of working collaboratively with a range of public and private organisations in the development, extension and adoption of new technology.

He was Chairman of the Science Advisory Group of the National Agricultural Monitoring System (NAMS) between 2005 and 2009, and a member of the NAMS Advisory Reference Group and Steering Committee. He also spent six years, to 2005, on the National Rural Advisory Council.

John was Chairman of ChemCert Training Queensland from 2002 to 2004 and has held positions with Cotton Australia and Farmsafe Queensland.



**Steve Jefferies**  
AM, BAgSc, PhD, GAICD

### Managing Director

*Appointed: 4 July 2016*

Steve has more than 30 years of experience working in the Australian grains industry, mostly in research management, prior to joining the GRDC as Managing Director in 2016.

Steve was CEO of Australian Grain Technologies, Australia's largest and market-leading wheat-breeding company, from its inception in 2002 until June 2016. From 1996 to 2002, Steve was a wheat breeder, barley breeder and senior lecturer at the University of Adelaide. From 1984 to 1996, Steve held positions in research management and ministerial liaison in the South Australian Government.

Steve has also been Chairman of the Australian End Point Royalty Steering Committee, a non-executive director of Birchip Cropping Group and Barley Australia, and a member of the Waite Institute Strategic Leadership Group and the Wheat Quality Classification Council of Wheat Quality Australia.

In June 2016, Steve was appointed Member of the Order of Australia for his significant services to primary industry.





### **Andrew Barr**

BAGSc, PhD, GAICD

#### **Director (Non-executive)**

*Appointed: 4 November 2014  
to 30 September 2017*

*Member: Finance, Risk and  
Audit Committee*

As a plant breeder at the South Australian Research and Development Institute and the University of Adelaide, Andrew led the release of 25 varieties of oats and barley. He also taught plant breeding and genetics at undergraduate and postgraduate levels.

Andrew has worked in international agriculture and food security, including collaborative projects with the International Center for Agricultural Research in the Dry Areas and board roles with the International Maize and Wheat Improvement Center (CIMMYT).

Andrew is an affiliate professor in the School of Agriculture, Food and Wine at the University of Adelaide and a director of the Australian Grain Growers Co-operative. He manages a broadacre cropping enterprise in the lower north of South Australia.



### **Jeremy Burdon**

BSc (Hons), PhD, Hon DSc, FAA,  
FTSE, MAICD

#### **Director (Non-executive)**

*Appointed: 4 November 2011  
to 30 September 2017*

*Member: Commercial  
Committee (Chair)  
Remuneration Committee*

Jeremy has an international reputation in evolutionary biology, with particular expertise in epidemiology and genetics. His research has contributed in a wide range of areas, including cereal rust control, pre-breeding and the biological control of weeds.

From late 2003 to 2012, Jeremy led CSIRO Plant Industry, taking responsibility for the development of its scientific capability; the strategic direction of its work; and its financial health and staff training.

Since then he has continued his research interests in the development of approaches for the application of evolutionary principles to farming systems through an appointment as an Honorary Fellow in CSIRO.

He served for six years on the Board of Trustees of Bioversity International and currently serves as the Chair of the Australian Academy of Science's National Committee for Agriculture, Fisheries and Food. In that role, he led the production of a decadal plan for agricultural science.



### **Helen Garnett**

PSM, BSc (Hons), PhD, FTSE,  
FAICD

#### **Director (Non-executive)**

*Appointed: 4 November 2014  
to 30 September 2017*

*Member: Finance, Risk and  
Audit Committee,  
Remuneration Committee*

Helen is an accomplished director and leader, building on an earlier research career, including with the agriculture industry, in pathogenesis and the development of diagnostics. She was awarded the Public Service Medal (2004) and the Centenary Medal (2000) for scientific and institutional leadership.

Helen is Chair of Generator Property Management. She is a non-executive director of Sugar Research Australia, the National Centre for Vocational Education Research, the Crawford Fund, Developing East Arnhem, and the Museum and Art Gallery of the Northern Territory.

Helen was previously Chair of the Australian Biosecurity Intelligence Network and Delta Electricity; a non-executive director of the Grape and Wine Research and Development Corporation; a director of Energy Resources of Australia Ltd, Carbon Energy Limited, and ABM Resources; Vice-Chancellor of Charles Darwin University; and Chief Executive of the Australian Nuclear Science and Technology Organisation.





## Kim Halbert

BComm, GAICD

### Deputy Chair (Non-executive)

*Appointed: 4 November 2011 to 30 September 2017*

*Appointed as Deputy Chair: 10 April 2012 to 3 November 2014; 27 January 2015 to 30 September 2017*

*Member: Finance, Risk and Audit Committee (Chair), Remuneration Committee*

Since 1980, Kim has been a grain producer in the mid-west region of Western Australia, where he undertakes numerous production trials and engages in innovative farming practices.

He has experience in the management and conservation of natural resources, which he demonstrated in his role as a member of the management committee overseeing Natural Heritage Trust project funding for the Arrowsmith Catchment Group.

Kim has a strong interest in the marketing of grain, which is reflected in his participation on a number of boards, including the board of Wheat Exports Australia.

As a director of the Geraldton Port Authority, the second largest grain-exporting port in Australia, he consulted with grain marketers, bulk handlers and grower organisations.



## Roseanne Healy

BA(Econ), MBA, MBR(Com), GAICD

### Director (Non-executive)

*Appointed: 4 November 2014 to 30 September 2017*

*Member: Commercial Committee, Finance, Risk and Audit Committee*

Roseanne has over 20 years of corporate advisory experience and expertise in strategy, investment review and corporate governance.

Roseanne started her corporate advisory career as an economics and market researcher for a number of Australia's global brands. As a tribunal member for the Office of Consumer and Business Affairs (South Australia) and CEO of SA Great, she influenced South Australia's economic credentials for investment attraction, spanning agriculture, aquaculture, food and wine, technology and infrastructure.

Roseanne is Chair of Vinehealth Australia, DairySafe and Peninsula Leisure Pty Ltd and a non-executive director of Airborne Research Australia Ltd, Enterprise Corporation Pty Ltd, GP Partners Australia and Nyamba Buru Yawuru Ltd.

Roseanne was previously a director of the Rural Industries Research and Development Corporation.



## David Shannon

BArch(Hons), NCFM (Durham), GAICD

### Director (Non-executive)

*Appointed: 4 November 2014 to 30 September 2017*

*Member: Commercial Committee*

David is a grains and livestock producer with more than 35 years of experience of farming in South Australia and Tasmania. In 1987, David was awarded an Australian Nuffield Scholarship to study grain legume production in Europe.

David has held many chair and director positions in the agricultural industry. He spent 15 years on the GRDC's Southern Regional Panel, including eight years as Chair.

David is the Independent Chairman of Mutooroo Pastoral Company.



## Director departed in 2016–17



### **Richard Clark**

ADFM, FAICD

#### **Chair (Non-executive)**

*Term: 1 October 2013 to 30 September 2016*

*Member: Remuneration Committee*

Richard runs an intensive grains enterprise, focusing on summer and winter cereals, pulses, and oilseeds, at Tulloona, New South Wales.

Richard is a graduate of the Orange Agricultural College and a fellow and graduate of the Australian Institute of Company Directors. He has extensive experience as a director and chairman of organisations in the agricultural sector and the grains industry in particular.

Richard's experience includes the positions of founding Chair of the New South Wales Farmers' Association Grains Research Committee and Chairman of the Wheat Research Foundation of New South Wales.

He has served as a director of Advantage Wheats, ChemCert Australia, the Grain Foods Cooperative Research Centre and Quality Farms Australia, and was a director of the GRDC from 1996 until 2002.

## Board selection

Members of the GRDC Board are selected and appointed in accordance with the *Primary Industries Research and Development Act 1989* (PIRD Act). Under that Act, the Minister is responsible for the selection and appointment of the Chair of the GRDC Board. The Managing Director is selected by the Board, and holds office at the corporation's pleasure.

All other board members are selected by a selection committee, appointed by the Minister under the PIRD Act, in consultation with the industry representative organisation declared under the PIRD Act and other grower organisations. The selection committee is responsible for nominating five to seven candidates to be appointed as GRDC directors. Nominations are made to the Minister and the formal appointment of directors is made by the Minister.

Richard Clark, who commenced as Chair on 1 October 2013, completed his term on 30 September 2016. The Minister for Agriculture and Water Resources appointed John Woods to a three-year term as Chair commencing on 1 October 2016.

## Committees

At 30 June 2017, the Board had three committees, as described in Table 12. The Board receives formal reports from the committees, and any decisions that the Board makes in relation to those reports are recorded in the minutes of the subsequent board meeting.



Table 12: Board committees

ROLE	MEMBERSHIP
<b>Commercial Committee</b>	
<p>Reviews, evaluates and makes recommendations to the Board and management on matters relating to:</p> <ul style="list-style-type: none"> <li>the strategic oversight of the GRDC in regard to its planning processes related to the integration of research, development, commercialisation and adoption processes</li> <li>the commercial and R&amp;D interaction between the GRDC and the private sector, including R&amp;D partnerships, commercial structures and other joint ventures</li> <li>the development of draft policies regarding ownership of project intellectual property, risk-sharing and licensing conditions with research and commercialisation partners to assist with the adoption of the results of R&amp;D</li> <li>corporate governance and risk management in the area of commercialisation and adoption of the results of R&amp;D, including oversight of the GRDC's role and investments in companies that undertake such commercialisation and adoption</li> <li>intellectual property management, protection and enforcement as necessary for the commercialisation of the results of R&amp;D.</li> </ul>	<p>Three non-executive directors appointed by the Board.</p>
<b>Finance, Risk and Audit Committee</b>	
<p>Assists the Board in fulfilling its corporate governance responsibilities and reviews the GRDC's:</p> <ul style="list-style-type: none"> <li>financial reporting process</li> <li>internal control system</li> <li>risk management strategy and processes</li> <li>internal and external audits</li> <li>process for monitoring compliance with laws and regulations and the Board's code of conduct</li> <li>financial statements.</li> </ul>	<p>At least three non-executive directors appointed by the Board.</p>
<b>Remuneration Committee</b>	
<p>Reviews and makes recommendations to the Board on matters relating to the remuneration and performance policy of the GRDC and the remuneration and performance of the Managing Director.</p>	<p>Chair, Deputy Chair and two other non-executive directors appointed by the Board.</p>



GRDC Board: (back) Steve Jefferies, Roseanne Healy, David Shannon, Jeremy Burdon, Andrew Barr, Helen Garnett (front) Kim Halbert, John Woods. Photo: Geoff Comfort

## Policies and practices

The Board Charter sets out the responsibilities and processes of the Board, including the code of conduct for directors. The Board reviews this document at least once a year.

Key policies and practices of the Board include:

- induction and continuous education—New board members participate in a formal induction process, and all board members undergo a process of continuous education.
- disclosure of interests—Directors must comply with the GRDC’s policy and procedures for conflict of interest and with legislative requirements regarding material personal interests. The Board reviews declarations of conflicts of interest at the start of each meeting and directors regularly update their declarations.
- independent professional advice—With the Chair’s approval, directors may obtain independent professional advice, at the GRDC’s expense, on matters arising in the course of their duties.

- performance monitoring—The Board sets out a detailed plan for the corporation at the start of each year, and reviews the corporation’s performance against the plan throughout the year. This is a key factor in determining the level of any performance bonuses paid to GRDC staff.
- external review—The Board periodically commissions an external review of its performance. A review was completed in March 2017.

## Meetings

During 2016–17, the Board held two meetings in Canberra and one meeting each in Adelaide, Geraldton (Western Australia), Melbourne, and Toowoomba (Queensland). Directors joined the regional advisory panels on their spring tours in September 2016.

Each director’s attendance at meetings during the year is set out in Table 13.

Table 13: Attendance at board and committee meetings

MEMBERS	BOARD		FINANCE, RISK AND AUDIT COMMITTEE		COMMERCIAL COMMITTEE		REMUNERATION COMMITTEE	
	Meetings attended	Meetings held and eligible to attend	Meetings attended	Meetings held and eligible to attend	Meetings attended	Meetings held and eligible to attend	Meetings attended	Meetings held and eligible to attend
<b>Directors at 30 June 2017</b>								
Andrew Barr	5	6	4	5	–	–	–	–
Jeremy Burdon	6	6	–	–	1	1	1	1
Helen Garnett	6	6	3	3	–	–	1	1
Kim Halbert	6	6	5	5	–	–	1	1
Roseanne Healy	6	6	5	5	1	1	–	–
Steve Jefferies	6	6	–	–	–	–	–	–
David Shannon	6	6	–	–	1	1	–	–
John Woods	6	6	2	2	–	–	1	1
<b>Director departed on 30 September 2016</b>								
Richard Clark	2	2	–	–	–	–	–	–



# Accountability and governance

The GRDC is accountable to Australian grain growers and the Australian Government for its performance in addressing their identified priorities.

The GRDC also meets its governance responsibilities as a corporate Commonwealth entity.

## Legislation

The GRDC was established in 1990 under the *Primary Industries Research and Development Act 1989* (PIRD Act).

As a corporate Commonwealth entity, the GRDC is subject to the requirements of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and other Commonwealth legislation.

## Accountability to the Australian Government

The GRDC resides in the Australian Government's Agriculture and Water Resources portfolio. During 2016–17, the GRDC was accountable to the Australian Parliament through the Deputy Prime Minister and Minister for Agriculture and Water Resources, the Hon Barnaby Joyce MP.

### Ministerial directions

The GRDC fully complies with relevant directions made by ministers under the PIRD Act, the PGPA Act or other Commonwealth legislation.

Under section 143 of the PIRD Act, the Minister for Agriculture and Water Resources may give written directions to the GRDC as to the performance of its functions and the exercise of its powers. No such directions were given in 2016–17.

Under section 22 of the PGPA Act, the Minister for Finance may give written directions to the corporation regarding complying with the general policies of the government. No such directions were given in 2016–17.

## Funding agreement

On 1 June 2015, the GRDC signed a funding agreement with the then Department of Agriculture in line with the requirements of the PIRD Act. The funding agreement sets out the terms and conditions under which money paid to the GRDC by the Commonwealth will be spent during the period from June 2015 to June 2019.

In accordance with the funding agreement, the GRDC operates a cost allocation policy and model that support decision making on GRDC investments and provide transparency in achieving value for money.

The GRDC also complies with the funding agreement by integrating government priorities into its strategic approach to RD&E investment, observing government policies in its operations, and working in consultation with the grains industry representative organisations.

## Significant events

The GRDC Board writes to the Minister for Agriculture and Water Resources after each board meeting, outlining all key decisions and actions taken at the meeting. This communication includes particulars of any significant decisions, activities or changes as described in section 17BE(p) of the PGPA Rule.

The Board advised the Minister of a number of significant decisions and issues during 2016–17, including:

- a request to defer the development of the GRDC's next five-year R&D plan for completion by March 2018 instead of July 2017
- the GRDC organisational restructure
- the sale of the GRDC's shares in Arista Cereal Technologies.

The GRDC had nothing to report to the Minister under section 17BE(h) of the PGPA Rule, which relates to non-compliance with the finance law.



## Government RD&E priorities

The GRDC's RD&E investment strategy is designed to address the Australian Government's Science and Research Priorities and Rural Research, Development and Extension Priorities. The GRDC's R&D investments to meet the priorities are detailed in the appendix.

## Accountability to the grains industry

The GRDC is accountable to the Australian grains industry through the industry's representative organisations, as described in the PIRD Act, and consults widely with other industry organisations and grower groups.

## Representative organisations

In 2016–17, GrainGrowers and Grain Producers Australia were the declared representative organisations under section 7 of the PIRD Act.

The GRDC meets with the industry representative organisations at least once every six months, and provides a formal opportunity for them to review the GRDC's performance annually.

Consultation with the representative organisations in 2016–17 included discussions on:

- the development of the GRDC's next five-year R&D plan
- the drafting of the GRDC's annual operational plan for 2017–18
- the national grains industry strategy
- funding for industry good functions
- biosecurity research
- the development of a database of grains levy payers
- the PIRD Act process for appointing directors
- a restructure of the GRDC's organisation and regional deployment of staff
- the GRDC's continuous investment cycle and investment decision-making process
- a communication campaign for GRDC research partners
- GRDC partnerships with farming systems groups to deliver regional development and extension services.

The GRDC paid a total of \$20,866.56 (including GST) to GrainGrowers and Grain Producers Australia for industry consultation activities during 2016–17, in accordance with section 15 of the PIRD Act.

## Grains industry RD&E priorities

In setting directions for the Strategic R&D Plan 2012–17, the GRDC considered the *Grains Industry National Research, Development and Extension Strategy*, and identified grains industry priorities through direct consultations with a wide range of industry participants, including local research advisory committees, grower groups, grower organisations and individual grain growers.

The GRDC continually monitors evolving industry priorities, nationally and regionally, through its advisory panels and Regional Cropping Solutions networks; a wide range of other consultative forums, including Grower Solutions Groups; and direct feedback from growers and other industry participants.

Each year, the industry priorities are embedded in the GRDC's annual operational plan and the GRDC's performance in meeting the priorities is described in the corresponding annual reports.

## Corporate governance

The GRDC Board has overall responsibility for corporate governance within the organisation and places high value on continuously improving the GRDC's performance in this area.

Key corporate governance activities overseen by the GRDC Board in 2016–17 included:

- regularly monitoring the strategic risk environment and reviewing the fraud risk framework
- implementing the consultation plan for the next five-year R&D plan
- monitoring compliance with the funding agreement with the Commonwealth
- approving delegations and instruments relating to the organisational restructure
- allocating resources to, and assessing the effectiveness of, RD&E investments.



## Risk management and fraud control

The GRDC continually reviews and refines its risk management framework to reflect changes in the business environment and the GRDC's structure.

The Board considers a strategic risk report at its monthly meeting and reviews the operational risks every six months, or more often if significant changes arise in the operating environment.

The GRDC commissions external assessments of its fraud risk every two years. Fraud risk was reviewed in September 2016.

The Board's Finance, Risk and Audit Committee oversees the preparation and implementation of the GRDC's risk management initiatives and fraud control policy and plan.

## Independent audits

The Auditor-General is required to audit each Commonwealth entity's financial statements. In addition, the *Auditor-General Act 1997* confirms the power of the Auditor-General's office to carry out performance audits of Commonwealth entities and, in this role, to obtain documents and information.

The Auditor-General's independent audit report on the GRDC's financial statements for 2016–17 is presented on pages 66–67.

## Code of conduct

The GRDC Code of Conduct sets out the principles and expected standards of behaviour for directors, staff and panel members.

New directors and staff members are introduced to the code during induction, and presentations on the code are made to staff at regular intervals. All staff have access to the code via the policies section of the GRDC intranet.

## Indemnities and insurance premiums for officers

The GRDC holds directors' and officers' liability insurance cover through Comcover. During the year, no indemnity-related claims were made. The cost of directors' and officers' indemnity insurance for 2016–17 was \$27,104.92 (GST exclusive).

# External scrutiny

In 2016–17, the GRDC was not affected by judicial decisions or reviews by administrative tribunals, the Auditor-General, parliamentary committees, the Commonwealth Ombudsman or the Office of the Australian Information Commissioner.

# Industry levies

In 2016–17, a levy rate of 0.99 percent applied to all leviable crops covered by the GRDC, with the exception of maize, which was levied at 0.693 percent.

The levies were imposed and collected as stipulated by the:

- *Primary Industries (Excise) Levies Act 1999*, supported by the Primary Industries (Excise) Levies Regulations 1999, Schedules 4, 12, 20 and 25
- *Primary Industries Levies and Charges Collection Act 1991*, supported by the Primary Industries Levies and Charges Collection Regulations 1991, Schedules 8, 19, 29 and 34.

Proceeds from levies in 2016–17 are recorded in Note 1.2B of the Notes to the Financial Statements.

The GRDC paid the Department of Agriculture and Water Resources \$798,199.92 for the collection and management of levies in 2016–17.

# Ecologically sustainable development

The principles of ecologically sustainable development set out in the *Environment Protection and Biodiversity Conservation Act 1999* are embodied in the outcomes of the GRDC.

Achieving sustainable use and management of natural resources is one of the GRDC's core functions under the PIRD Act. It is also a key



element of the government and grains industry priorities that shape the Strategic R&D Plan 2012–17, and the themes which underpin the GRDC’s RD&E investment decisions.

In 2016–17, the GRDC supported many projects that contributed to the objectives of ecologically sustainable development, including work to:

- improve productivity while reducing environmental impact
- understand and preserve soil and water quality
- optimise biological diversity
- foster the economic, environmental and social health of the grains industry, in the present and the longer term.

## Work health and safety

The GRDC’s work health and safety mission is to create a workplace environment where the health, safety and wellbeing of employees are highly valued and people are encouraged and supported to adopt and maintain a healthy lifestyle.

Table 14 summarises the GRDC’s results in relation to reportable indicators of work health and safety performance in 2016–17.

Table 14: Work health and safety performance

INDICATORS	PERFORMANCE
Initiatives undertaken during the year to ensure the health, safety and welfare of workers who carry out work for the GRDC	<p>Work health and safety was a standing agenda item at board meetings and staff meetings.</p> <p>All first aid attendants were sent to full refresher training courses and all new staff received health and safety training during their induction.</p> <p>Counselling was made available for staff members and members of their families through the Employee Assistance Program.</p> <p>The GRDC offered staff flu vaccinations and provided fresh fruit daily.</p> <p>Activities to ensure that facilities were well maintained included:</p> <ul style="list-style-type: none"> <li>• twice yearly inspection of fire extinguishers</li> <li>• annual checking and restocking of the first aid kits</li> <li>• annual checking and tagging of electrical leads and power cords</li> <li>• regular inspections of smoke and heat detectors</li> <li>• regular cleaning of carpets.</li> </ul>
Health and safety outcomes (including the impact on injury rates of workers) achieved as a result of initiatives	The health and safety initiatives were effective in maintaining the GRDC’s low incidence of injury rates. In 2016–17 the incident rate was 5.79%.
Statistics of any notifiable incidents of which the GRDC became aware that arose out of the conduct of businesses or undertakings by the GRDC	No incidents occurred.
Details of any investigations conducted during the year that relate to the businesses or undertakings of the GRDC, including details of all notices given to the GRDC under Part 10 of the <i>Work Health and Safety Act 2011</i>	No investigations were conducted and no notices were given.
Other matters as required by the guidelines approved on behalf of the Parliament by the Joint Committee of Public Accounts and Audit	No other matters were required to be reported.





Photo: Brad Collis

# Financial statements

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# Independent auditor's report



## INDEPENDENT AUDITOR'S REPORT

To the Minister for Agriculture and Water Resources

### Opinion

In my opinion, the financial statements of the Grains Research and Development Corporation and the consolidated entity for the year ended 30 June 2017:

- (a) comply with Australian Accounting Standards – Reduced Disclosure Requirements and the *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015*; and
- (b) present fairly the financial position of the Grains Research and Development Corporation and the consolidated entity as at 30 June 2017 and the financial performance and cash flows for the year then ended.

The financial statements of the Grains Research and Development Corporation and the consolidated entity, which I have audited, comprise the following statements as at 30 June 2017 and for the year then ended:

- Statement by the Directors, Managing Director and Financial Controller;
- Statements of Comprehensive Income;
- Statement of Financial Position;
- Statement of Changes in Equity;
- Cash Flow Statements; and
- Notes to and forming part of the financial statements comprising a Summary of Significant Accounting Policies and other explanatory information.

### Basis for Opinion

I conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. My responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of my report. I am independent of the Grains Research and Development Corporation and the consolidated entity in accordance with the relevant ethical requirements for financial statement audits conducted by the Auditor-General and his delegates. These include the relevant independence requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* to the extent that they are not in conflict with the *Auditor-General Act 1997* (the Code). I have also fulfilled my other responsibilities in accordance with the Code. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

### Accountable Authority's Responsibility for the Financial Statements

As the Accountable Authority of the Grains Research and Development Corporation the Directors are responsible under the *Public Governance, Performance and Accountability Act 2013* for the preparation and fair presentation of annual financial statements that comply with Australian Accounting Standards – Reduced Disclosure Requirements and the rules made under that Act. The Directors are also responsible for such internal control as the Directors determine is necessary to enable the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Directors are responsible for assessing the Grains Research and Development Corporation and the consolidated entity's ability to continue as a going concern, taking into account whether the entities' operations will cease as a result of an administrative restructure or for any other reason. The Directors are also responsible for disclosing matters related to going concern as applicable and using the going concern basis of accounting unless the assessment indicates that it is not appropriate.

GPO Box 707 CANBERRA ACT 2601  
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### **Auditor's Responsibilities for the Audit of the Financial Statements**

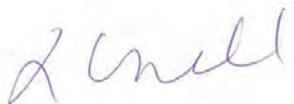
My objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian National Audit Office Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with the Australian National Audit Office Auditing Standards, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Grains Research and Development Corporation and the consolidated entity's internal control;
- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Accountable Authority;
- conclude on the appropriateness of the Accountable Authority's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Grains Research and Development Corporation's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Grains Research and Development Corporation to cease to continue as a going concern;
- evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation; and
- obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the consolidated entity to express an opinion on the financial report. I am responsible for the direction, supervision and performance of the consolidated entity audit. I remain solely responsible for my audit opinion.

I communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

Australian National Audit Office



Lesla Craswell  
Acting Executive Director

Delegate of the Auditor-General

Canberra  
15 August 2017



## Statement by the directors, Managing Director and Financial Controller

### GRAINS RESEARCH AND DEVELOPMENT CORPORATION

#### STATEMENT BY THE DIRECTORS, MANAGING DIRECTOR AND FINANCIAL CONTROLLER

In our opinion, the attached financial statements for the year ended 30 June 2017 comply with subsection 42(2) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), and are based on properly maintained financial records as per subsection 41(2) of the PGPA Act.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Corporation will be able to pay its debts as and when they fall due.

The statement is made in accordance with a resolution of the directors.

Signed..... 	Signed..... 	Signed..... 
Mr J D Woods CHAIRMAN	Dr S P Jefferies MANAGING DIRECTOR	Mrs D K Jakubowski FINANCIAL CONTROLLER
14 August 2017	14 August 2017	14 August 2017

# Statement of Comprehensive Income

For the period ended 30 June 2017

	NOTES	CONSOLIDATED		CORPORATION		ORIGINAL BUDGET
		*2017 \$'000	*2016 \$'000	2017 \$'000	2016 \$'000	
<b>NET COST OF SERVICES</b>						
<b>Expenses</b>						
Employee benefits	1.1A	10,926	10,490	10,926	10,490	11,500
Research and Development	1.1B	198,129	192,796	198,129	196,796	207,595
Suppliers	1.1C	11,583	9,440	11,583	9,440	-
Depreciation and amortisation	2.2A	1,489	934	1,489	934	1,405
Write-down and impairment of assets	1.1D	1,430	1,364	1,430	1,364	-
Losses from asset sales	1.1E	-	19	-	19	-
Loss on deconsolidation	1.1F	4,123	-	-	-	-
<b>Total expenses</b>		<b>227,680</b>	<b>215,043</b>	<b>223,557</b>	<b>219,043</b>	<b>220,500</b>
<b>Own-source Income</b>						
<b>Own-source revenue</b>						
Interest	1.2A	552	1,016	485	963	7,791
Industry contributions	1.2B	139,366	110,370	139,366	110,370	114,519
Project refunds	1.2C	5,219	3,739	5,219	3,739	3,302
Royalties	1.2D	11,648	7,865	11,648	7,865	5,163
Grants income	1.2E	2,492	527	2,492	527	1,155
Other revenue	1.2F	413	817	413	817	-
<b>Total own-source revenue</b>		<b>159,690</b>	<b>124,334</b>	<b>159,623</b>	<b>124,281</b>	<b>131,930</b>
<b>Gains</b>						
Gains from sale of assets	1.2G	6,070	290	6,070	290	-
Change in fair value through profit or loss	1.2G	3,395	6,113	3,395	6,113	-
<b>Total gains</b>		<b>9,465</b>	<b>6,403</b>	<b>9,465</b>	<b>6,403</b>	<b>-</b>
<b>Total own-source income</b>		<b>169,155</b>	<b>130,737</b>	<b>169,088</b>	<b>130,684</b>	<b>131,930</b>
<b>Net contribution / (cost) of services</b>		<b>(58,525)</b>	<b>(84,306)</b>	<b>(54,469)</b>	<b>(88,359)</b>	<b>(88,570)</b>
Revenue from Government	1.2H	73,285	70,225	73,285	70,225	68,158
Share of surplus/(deficit) of associates and joint ventures accounted for using the equity method		-	-	-	-	-
<b>Surplus/(Deficit) attributable to the Australian Government</b>		<b>14,760</b>	<b>(14,081)</b>	<b>18,816</b>	<b>(18,134)</b>	<b>(20,412)</b>
<b>OTHER COMPREHENSIVE INCOME</b>						
<b>Items not subject to subsequent reclassification to net cost of services</b>						
Changes in asset revaluation surplus	2.2A	(476)	(190)	(476)	(190)	-
<b>Total other comprehensive income/(loss)</b>		<b>(476)</b>	<b>(190)</b>	<b>(476)</b>	<b>(190)</b>	<b>-</b>
<b>Total comprehensive income/(loss)</b>		<b>14,284</b>	<b>(14,271)</b>	<b>18,340</b>	<b>(18,324)</b>	<b>(20,412)</b>
<b>Total comprehensive income/(loss) attributable to the Australian Government</b>		<b>14,284</b>	<b>(14,271)</b>	<b>18,340</b>	<b>(18,324)</b>	<b>(20,412)</b>

The above statement should be read in conjunction with the accompanying notes.

\* On 17 March 2017, the Corporation lost control of its only subsidiary. The consolidated disclosure includes the Corporation's transactions for the full financial year and the subsidiary's transactions to the date of control loss.

## Budget Variances Commentary

### Statement of Comprehensive Income

The Employee expenses variance was due to a number of staff vacancies throughout the year and reductions on employee provisions resulting from restructure activities.

The budget for Suppliers was not split between Research and Development and Suppliers in the Portfolio Budget Statements (PBS). Comparison of Research and Development and Suppliers costs with the total reported in the PBS does not illustrate any significant variances.

The budget for Interest Income should be read in conjunction with Interest Income and Change in Fair Value Through Profit or Loss (which includes the income from the Corporation's managed funds). Interest Income and Change in Fair Value Through Profit or Loss was less than budget principally due to a net revaluation decrement of the bonds held with the fund managers. This was driven by unfavourable movements in the bond market throughout the year.

Industry Contributions were more than budget due to record-high levels of grains production in 2016-17.

Project Refunds were more than budget due to significant stocktaking activities on outstanding project obligations.

Royalties were more than budget due to the recognition of wheat royalties owing from Australian Grain Technologies, and as a result of higher production levels in 2016-17.

Grant Income was more than budget due to the recognition of an additional grant from the Department of Agriculture and Water Resources at year-end relating to the Rural R&D for Profit Program which was not known at the time of budget preparation.

Gains from sale of assets was the profit on sale of Arista Cereals Technologies shares. This was budgeted to occur in 2015-16, but prolonged negotiations have resulted in the sale being completed in 2016-17. Therefore the variance was a timing difference.

Commonwealth Contributions were more than budget due to record-high levels of grains production in 2016-17, normalised by the three-year rolling average of GVP for grains.



# Statement of Financial Position

as at 30 June 2017

	NOTES	CORPORATION		ORIGINAL
		2017	2016	BUDGET
		\$'000	\$'000	\$'000
<b>ASSETS</b>				
<b>Financial assets</b>				
Cash and cash equivalents	2.1A	9,533	6,618	18,445
Trade and other receivables	2.1B	48,207	49,844	26,190
Investments in managed funds	2.1C	225,199	197,009	162,891
Other investments	2.1D	4,418	4,215	5,353
<b>Total financial assets</b>		<b>287,357</b>	<b>257,686</b>	<b>212,879</b>
<b>Non-financial assets</b>				
Land and buildings	2.2A	6,283	7,189	6,661
Property, plant and equipment	2.2A	615	778	969
Intangibles	2.2A	4,525	3,782	2,874
Other non-financial assets	2.2B	8,435	961	2,200
<b>Total non-financial assets</b>		<b>19,858</b>	<b>12,710</b>	<b>12,704</b>
Assets held for sale	2.3	-	1,461	-
<b>Total assets</b>		<b>307,215</b>	<b>271,857</b>	<b>225,583</b>
<b>LIABILITIES</b>				
<b>Payables</b>				
Suppliers	2.4A	2,137	3,402	70,423
Research and development	2.4B	91,536	72,934	
Other payables	2.4C	4,220	4,064	1,154
<b>Total payables</b>		<b>97,893</b>	<b>80,400</b>	<b>71,577</b>
<b>Provisions</b>				
Employee provisions	2.5A	1,732	2,028	2,050
Other provisions	2.5B	1,762	1,941	1,762
<b>Total provisions</b>		<b>3,494</b>	<b>3,969</b>	<b>3,812</b>
<b>Total liabilities</b>		<b>101,387</b>	<b>84,369</b>	<b>75,389</b>
<b>Net assets</b>		<b>205,828</b>	<b>187,488</b>	<b>150,194</b>
<b>EQUITY</b>				
Retained surplus		99,780	76,014	43,120
Asset revaluation surplus		2,098	2,574	
Contracted research reserve		103,950	108,900	107,074
<b>Total equity</b>		<b>205,828</b>	<b>187,488</b>	<b>150,194</b>

The above statement should be read in conjunction with the accompanying notes.

## Budget Variances Commentary

### Statement of Financial Position

The variance in Cash and Cash Equivalents is explained by the Cash Flow Statement.

Receivables were more than budget principally due to the recognition of a significant royalty receivable from a single entity.

Investments in managed funds were more than budget due to the investment of cash generated from operating activities.

Other investments were less than budget due to the write-down of shares acquired in previous financial years.

The value of Land and Buildings were less than budget as a result of the revaluation decrement recognised at 30 June 2017. The decrement is consistent with market trends for commercial property of a similar grade.

Plant & Equipment assets were less than budget due to savings in fit-out costs associated with the establishment of the regional offices.

Intangibles were more than budget principally due to a timing issue associated with the recognition of a significant software development. The costs associated with the development and implementation of enterprise software achieved in 2016-17 was budgeted to occur in the 2015-16 financial year.



# Statement of Changes in Equity

as at 30 June 2017

	NOTES	CORPORATION		ORIGINAL
		2017	2016	BUDGET
		\$'000	\$'000	\$'000
<b>RETAINED EARNINGS</b>				
<b>Opening balance</b>				
Balance carried forward from previous period		76,014	80,221	59,132
Prior period correction		-	14,477	-
<b>Adjusted opening balance</b>		<b>76,014</b>	<b>94,698</b>	<b>59,132</b>
<b>Comprehensive income</b>				
Surplus/(Deficit) for the period		18,816	(18,134)	(20,412)
<b>Total comprehensive income</b>		<b>18,816</b>	<b>(18,134)</b>	<b>(20,412)</b>
Transfers between equity components		4,950	(550)	4,400
<b>Closing balance as at 30 June</b>		<b>99,780</b>	<b>76,014</b>	<b>43,120</b>
<b>ASSET REVALUATION RESERVE</b>				
<b>Opening balance</b>				
Balance carried forward from previous period		2,574	2,764	2,574
<b>Adjusted opening balance</b>		<b>2,574</b>	<b>2,764</b>	<b>2,574</b>
<b>Comprehensive income</b>				
Other comprehensive income		(476)	(190)	-
<b>Total comprehensive income</b>		<b>(476)</b>	<b>(190)</b>	<b>-</b>
<b>Closing balance as at 30 June</b>		<b>2,098</b>	<b>2,574</b>	<b>2,574</b>
<b>CONTRACTED RESEARCH RESERVE</b>				
<b>Opening balance</b>				
Balance carried forward from previous period		108,900	108,350	108,900
<b>Adjusted opening balance</b>		<b>108,900</b>	<b>108,350</b>	<b>108,900</b>
Transfers between equity components		(4,950)	550	(4,400)
<b>Closing balance as at 30 June</b>		<b>103,950</b>	<b>108,900</b>	<b>104,500</b>
<b>TOTAL EQUITY</b>				
<b>Opening balance</b>				
Balance carried forward from previous period		187,488	191,335	170,606
Prior period correction		-	14,477	-
<b>Adjusted opening balance</b>		<b>187,488</b>	<b>205,812</b>	<b>170,606</b>
<b>Comprehensive income</b>				
Surplus/(Deficit) for the period		18,816	(18,134)	(20,412)
Other comprehensive income		(476)	(190)	-
<b>Total comprehensive income</b>		<b>18,340</b>	<b>(18,324)</b>	<b>(20,412)</b>
Transfers between equity components		-	-	-
<b>Closing balance as at 30 June</b>		<b>205,828</b>	<b>187,488</b>	<b>150,194</b>

The above statement should be read in conjunction with the accompanying notes.

## Budget Variances Commentary

### Statement of Changes in Equity

This prior period correction relates to royalties owing from prior years that had not been previously recognised. Refer to the Prior Period Correction note in the Overview for more information.

Refer to the commentary in the Statement of Comprehensive Income regarding the Operating Result variance.

The variance in the Asset Revaluation Reserve was due to the revaluation decrement on Land and Buildings at 30 June 2017.



# Cash Flow Statement

For the period ended 30 June 2017

	NOTES	CONSOLIDATED		CORPORATION		ORIGINAL BUDGET \$'000
		*2017 \$'000	*2016 \$'000	2017 \$'000	2016 \$'000	
<b>OPERATING ACTIVITIES</b>						
<b>Cash received</b>						
Industry contributions		138,821	110,336	138,821	110,336	114,519
Commonwealth contributions		71,891	67,570	71,891	67,570	68,342
Interest		5,790	6,934	5,714	6,881	7,791
Grants receipts		2,927	5,767	2,927	1,267	-
Other		9,853	11,066	9,853	10,316	8,465
Net GST received		21,516	17,334	21,616	18,384	20,760
<b>Total cash received</b>		<b>250,798</b>	<b>219,007</b>	<b>250,822</b>	<b>214,754</b>	<b>219,877</b>
<b>Cash used</b>						
Research and development		194,557	214,575	194,557	218,975	229,781
Suppliers		13,239	11,090	13,233	11,090	
Employees		11,221	10,624	11,221	10,624	11,450
<b>Total cash used</b>		<b>219,017</b>	<b>236,289</b>	<b>219,011</b>	<b>240,689</b>	<b>241,231</b>
<b>Net cash from/(used by) operating activities</b>		<b>31,781</b>	<b>(17,282)</b>	<b>31,811</b>	<b>(25,935)</b>	<b>(21,354)</b>
<b>INVESTING ACTIVITIES</b>						
<b>Cash received</b>						
Proceeds from sales of property, plant and equipment		15	-	15	-	-
Investments		57,524	45,749	57,524	45,749	70,000
<b>Total cash received</b>		<b>57,539</b>	<b>45,749</b>	<b>57,539</b>	<b>45,749</b>	<b>70,000</b>
<b>Cash used</b>						
Purchase of property, plant and equipment		3,475	1,835	3,475	1,835	750
Investments		81,530	93,895	81,530	93,895	43,000
Shares		1,430	-	1,430	-	-
<b>Total cash used</b>		<b>86,435</b>	<b>95,730</b>	<b>86,435</b>	<b>95,730</b>	<b>43,750</b>
<b>Net cash from/(used by) investing activities</b>		<b>(28,896)</b>	<b>(49,981)</b>	<b>(28,896)</b>	<b>(49,981)</b>	<b>26,250</b>
<b>Net increase/(decrease) in cash held</b>		<b>2,885</b>	<b>(67,263)</b>	<b>2,915</b>	<b>(75,916)</b>	<b>4,896</b>
Cash and cash equivalents at the beginning of the reporting period		15,271	82,534	6,618	82,534	13,549
<b>Cash and cash equivalents at the end of the reporting period 2.1A</b>		<b>18,156</b>	<b>15,271</b>	<b>9,533</b>	<b>6,618</b>	<b>18,445</b>

The above statement should be read in conjunction with the accompanying notes.

\* On 17 March 2017, the Corporation lost control of its only subsidiary. The consolidated disclosure includes the Corporation's transactions for the full financial year and the subsidiary's transactions to the date of control loss.

## Budget Variances Commentary

### Cash Flow Statement

Industry Contributions Cash Received was more than budget due to record-high levels of grain production in 2016-17.

The variance of Commonwealth Contributions Cash Received is a result of the 2015-16 Commonwealth Contributions revenue being higher than budgeted. Since the Corporation recognised part of this revenue as an accrual at 30 June 2016, the impact from a cash perspective was only realised in 2016-17.

Interest Income Cash Received is less than budget due to lower than anticipated returns from the investments held with the fund managers. Lower returns are directly associated with prevailing market conditions.

Grants receipts were more than budget due to a new grant received at year-end that had not been anticipated at the time the budget was developed.

The Other Income Cash Received variance relates to Royalties received. This was less than budget as a result of a timing issue - a greater proportion were accrued at 30 June 2017 rather than received during the year.

The budget for Supplier Cash Used was not split between Research and Development and Suppliers, but needs to be compared to both of these lines. Suppliers Cash Used was less than budget due to significant Research and Development expenditure contracted near balance date creating existing obligations with payments to be settle the obligation early in 2017-18.

The variances for Investments Cash Received and Investments Cash Used relate to the Operating Surplus for 2016-17 - a Deficit had been budgeted - therefore additional cash was available for investment and less cash was needed to be withdrawn to fund operational requirements.



# Notes to and forming part of the financial statements

For the year ended 30 June 2017

## Overview

The Grains Research and Development Corporation (the Corporation) is an Australian Government controlled entity, established in 1990 as a statutory corporation under the *Primary Industries Research and Development Act 1989*. It is a not-for-profit entity. The Corporation is structured to meet the following outcome:

Outcome 1 – New information and products that enhance the productivity, competitiveness and environmental sustainability of Australian grain growers and benefit the industry and wider community, through planning, managing and implementing investments in grains research and development.

The continued existence of the Corporation in its present form and with its present programs is dependent on Government policy.

For the purposes of AASB 10 *Consolidated Financial Statements*, consolidated financial statements are prepared to include the Corporation's subsidiary, the Grains and Cropping R&D Trust. Refer to the Consolidation note for further information.

## Basis of Preparation

The financial statements are general purpose financial statements and are required by section 42 of the *Public Governance, Performance and Accountability Act 2013*.

The Corporation and Group's consolidated financial statements have been prepared in accordance with:

- a) *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015* (FRR) for reporting periods ending on or after 1 July 2015; and
- b) Australian Accounting Standards and Interpretations – Reduced Disclosure Requirements issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial statements are presented in Australian dollars.

## New Australian Accounting Standards

### *Adoption of new Australian Accounting Standard Requirements*

No accounting standard has been adopted earlier than the application date as stated in the standard.

The following new standards, revised standards, interpretations and amendments to standards that were issued prior to the signing of the Statement by Directors, Managing Director and Financial Controller and were applicable to the current reporting period had a material effect on the Corporation's financial statements.

ACCOUNTING STANDARD	SUMMARY OF CHANGES	EFFECTIVE DATE
AASB 124 Related Party Disclosures	The standard applies to not-for-profit entities for 2016-17. This will require the disclosure of remuneration for key management personnel and the disclosure of transactions with related parties.	1 July 2016



## Future Australian Accounting Standard Requirements

The following new standards, revised standards, interpretations and amendments to standards that were issued by the Australian Accounting Standards Board prior to the signing of the Statement of Directors, Managing Director and Financial Controller that are expected to have a material impact on the Corporation's financial statements for future reporting periods.

ACCOUNTING STANDARD	SUMMARY OF CHANGES	EFFECTIVE DATE
AASB 16 Leases	<p>AASB 16 introduces a single lessee accounting model and requires a lessee to recognise assets and liabilities for all leases with a term of more than 12 months, unless the underlying asset is of low value. A lessee is required to recognise a right-of-use asset representing its right to use the underlying leased asset and a lease liability representing its obligations to make lease payments.</p> <p>AASB 16 substantially carries forward the lessor accounting requirements in AASB 117 Leases. Accordingly, a lessor continues to classify its leases as operating leases or finance leases, and to account for those two types of leases differently.</p> <p>AASB 16 requires enhanced disclosures for both lessees and lessors to improve information disclosed about an entity's exposure to leases.</p>	1 January 2019

## Consolidation

AASB 10 requires a parent entity that is in a group to present consolidated financial statements that consolidate its investments in its controlled entities. The parent and the controlled entities apply consistent accounting policies, have the same reporting period and the effects of all transactions and balances between the entities are eliminated in full.

The consolidated group consists of the parent entity the Grains Research and Development Corporation and the subsidiary the Grains and Cropping R&D Trust. On 17 March 2017, the Corporation lost control of the Grains and Cropping R&D Trust. On loss of control the assets and liabilities of the subsidiary are derecognised and a loss to the consolidated group is recognised in note 1.1F.

The consolidated group ceased to exist at 30 June 2017 and as such, no consolidated Statement of Financial Position, Statement of Changes in Equity, or accompanying notes are disclosed. A consolidated Statement of Comprehensive Income, Cash Flow Statement and accompanying notes are disclosed. The consolidated disclosure includes transactions for the Corporation for the full financial year and for the subsidiary up to 17 March 2017.



## Prior Period Correction

During 2017 the Corporation identified a loans and receivables financial asset relating to royalty revenues that had not been previously recognised in the financial statements. The agreement associated with the royalties entitled the Corporation to income from 1 July 2002 to 30 June 2017, which stipulated conditions for settling amounts owed to the Corporation. The agreement specified that amounts that were not settled within 12 months reverted to interest free loans. The incorrect accounting treatment was applied for the recognition of royalties at the inception of the agreement. The value of the loans and receivables not recognised at 30 June 2016 was \$17,890,568. The corrections have been made to comparatives presented in the financial statements and accompanying notes. The corrections include a correction to royalty revenue of \$3,413,824 and opening retained surpluses of \$14,476,744. The total correction has an impact of \$17,890,568 to opening retained surpluses for the financial year ended 30 June 2017. The corrections are disclosed in the table below:

## Statement of Comprehensive Income

	CONSOLIDATED REPORTED 2015-16 \$'000	CONSOLIDATED RESTATED 2015-16 \$'000	CORPORATION REPORTED 2015-16 \$'000	CORPORATION RESTATED 2015-16 \$'000
<b>Own-source revenue</b>				
Interest	1,016	1,016	963	963
Industry contributions	110,370	110,370	110,370	110,370
Project refunds	3,739	3,739	3,739	3,739
Royalties	4,451	7,865	4,451	7,865
Grant income	527	527	527	527
Other revenue	817	817	817	817
<b>Total own-source income</b>	<b>120,920</b>	<b>124,334</b>	<b>120,867</b>	<b>124,281</b>
<b>Surplus / (deficit) attributable to the Australian Government</b>	<b>(17,495)</b>	<b>(14,081)</b>	<b>(21,548)</b>	<b>(18,134)</b>
<b>Total comprehensive income attributable to the Australian Government</b>	<b>(17,685)</b>	<b>(14,271)</b>	<b>(21,738)</b>	<b>(18,324)</b>

## Statement of Financial Position

	CORPORATION REPORTED 2015-16 \$'000	CORPORATION RESTATED 2015-16 \$'000
<b>ASSETS</b>		
Financial assets		
Cash and cash equivalents	6,618	6,618
Trade and other receivables	31,953	49,844
Investments in managed funds	197,009	197,009
Other investments	4,215	4,215
<b>Total financial assets</b>	<b>239,795</b>	<b>257,686</b>
<b>Total assets</b>	<b>253,966</b>	<b>271,857</b>
<b>Net assets</b>	<b>169,597</b>	<b>187,488</b>
<b>EQUITY</b>		
Retained surplus	58,123	76,014
Asset revaluation surplus	2,574	2,574
Contracted research reserve	108,900	108,900
<b>Total equity</b>	<b>169,597</b>	<b>187,488</b>



## Taxation

The Corporation is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

## Events After the Reporting Period

There was no subsequent event that had the potential to significantly affect the on-going structure and financial activities of the Corporation.

## 1.1: Expenses

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>1.1A – Employee Benefits</b>				
Wages and salaries	9,272	8,964	9,272	8,964
Superannuation				
Defined contribution plans	993	906	993	906
Defined benefits plans	158	183	158	183
Leave and other entitlements	(286)	(91)	(286)	(91)
Separation and redundancies	789	528	789	528
<b>Total employee benefits</b>	<b>10,926</b>	<b>10,490</b>	<b>10,926</b>	<b>10,490</b>

## Accounting Policy

Accounting policies for employee related expenses are contained at note 2.5A.

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>1.1B – Research and Development</b>				
Cross-commodity	130,979	179,330	130,979	183,330
Course grains	12,221	1,096	12,221	1,096
Grain legumes	13,286	5,941	13,286	5,941
Oilseeds	5,133	601	5,133	601
Wheat	36,510	5,828	36,510	5,828
<b>Total research and development</b>	<b>198,129</b>	<b>192,796</b>	<b>198,129</b>	<b>196,796</b>



	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>1.1C – Suppliers</b>				
<b>Goods and services supplied or rendered</b>				
Staff travel and accommodation	1,697	1,425	1,697	1,425
Consultants	355	66	355	66
Panel expenses	2,070	2,115	2,070	2,115
*Communications	791	127	791	127
**Corporate governance	84	964	84	964
Corporate services	3,393	2,178	3,393	2,178
Levy collection costs	798	511	798	511
Other	960	742	960	742
<b>Total goods and services supplied or rendered</b>	<b>10,148</b>	<b>8,128</b>	<b>10,148</b>	<b>8,128</b>
Goods supplied	104	59	104	59
Services supplied	10,044	8,069	10,044	8,069
<b>Total goods supplied</b>	<b>10,148</b>	<b>8,128</b>	<b>10,148</b>	<b>8,128</b>
<b>Other suppliers</b>				
Operating lease rentals in connection with				
Minimum lease payments	1,376	1,247	1,376	1,247
Workers compensation expenses	59	65	59	65
<b>Total other suppliers</b>	<b>1,435</b>	<b>1,312</b>	<b>1,435</b>	<b>1,312</b>
<b>Total suppliers</b>	<b>11,583</b>	<b>9,440</b>	<b>11,583</b>	<b>9,440</b>

\* Communications expense is significantly different to the comparative year due to a change in policy in relation to classification of expenditure.

\*\* Corporate governance expense is significantly different to the comparative year due to the comparative year including non-capital costs relating to the review of business processes to inform the development of the new investment management system.

## Leasing commitments

The Corporation in its capacity as lessee has entered into the following leases:

NATURE OF LEASE	GENERAL DESCRIPTION OF LEASE AGREEMENT
Leases for office accommodation	<p>Lease payments are subject to annual reviews in accordance with the lease agreements.</p> <p>The lease of the Canberra office commenced on 1 May 2014 for a period of 10 years. There is an option to extend the lease term for 4 years. The annual review of this lease is a fixed percentage increase. As part of the lease agreement, a cash incentive of \$1,785,525 (GST exclusive) was received, which has been applied as a rent-free period at the beginning of the lease term.</p> <p>The lease of the Adelaide office commenced on 4 February 2016, with 5 rights of renewal of 1 year each. The annual review for this agreement is based on CPI.</p> <p>The lease of the Dubbo office commenced on 8 February 2016 for a period of 5 years. There is an option to extend the lease term for 5 years. The annual review for this agreement is based on CPI. As part of the lease agreement, a rent-free period was provided at the beginning of the lease term.</p> <p>The lease of the Toowoomba office commenced on 15 March 2016 for a period of 5 years. The annual review for this agreement is based on CPI.</p> <p>The lease of the Perth office commenced on 11 July 2016 for a period of 5 years. There is an option to extend the lease term for 5 years. The annual review for this agreement is based on CPI.</p>
Motor vehicles - staff	<p>Leased as part of salary packages</p> <p>No contingent rentals exist</p>
Franking machine	<p>A rental agreement for a period of 5 years exists for the franking machine, after this time it is usually replaced with new rental equipment</p>



	CORPORATION	
	2017 \$'000	2016 \$'000
<b>Commitments for minimum lease payments in relation to non-cancellable operating leases are payable as follows:</b>		
Within 1 year	1,437	1,367
Between 1 to 5 years	5,000	5,036
More than 5 years	2,054	3,174
<b>Total operating lease commitments</b>	<b>8,491</b>	<b>9,577</b>

## Accounting Policy

Operating lease payments are expensed on a straight-line basis which is representative of the pattern of benefits derived from the leased assets.

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>1.1D – Write-down and Impairment of Assets</b>				
<b>Asset write-downs and impairments from:</b>				
Investments (shares) – revaluation decrement	1,430	1,138	1,430	1,138
Convertible note embedded derivative – revaluation decrement	-	226	-	226
<b>Total write-down and impairment of assets</b>	<b>1,430</b>	<b>1,364</b>	<b>1,430</b>	<b>1,364</b>

### 1.1E – Losses from Asset Sales

<b>Loss from asset sales from:</b>				
Obsolete plant & equipment	-	19	-	19
<b>Total loss on asset sales</b>	<b>-</b>	<b>19</b>	<b>-</b>	<b>19</b>

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Loss on deconsolidation from:</b>				
Loss of control of subsidiary	4,123	-	-	-
<b>Total loss on deconsolidation</b>	<b>4,123</b>	<b>-</b>	<b>-</b>	<b>-</b>

## 1.2: Own-source Revenue and Gains

### Own-source Revenue

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2A – Interest</b>				
Deposits	382	915	315	862
Convertible notes	114	101	114	101
Loans	56	-	56	-
<b>Total interest</b>	<b>552</b>	<b>1,016</b>	<b>485</b>	<b>963</b>



## Accounting Policy

Interest revenue is recognised using the effective interest method.

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2B – Industry Contributions</b>				
Coarse grains	26,229	24,982	26,229	24,982
Grain legumes	25,496	16,883	25,496	16,883
Oilseeds	25,643	17,531	25,643	17,531
Wheat	61,998	50,974	61,998	50,974
<b>Total industry contributions</b>	<b>139,366</b>	<b>110,370</b>	<b>139,366</b>	<b>110,370</b>

## Accounting Policy

Revenue paid to the Corporation under Section 30 of the *Primary Industries Research and Development Act 1989*, where a research levy is attached to grain producers' output, is for the purpose of providing funds for research and development. Industry contributions are recognised when they are entitled to be received by the Corporation.

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2C – Project Refunds</b>				
<b>Total project refunds</b>	<b>5,219</b>	<b>3,739</b>	<b>5,219</b>	<b>3,739</b>

## Accounting Policy

Project refunds are recognised upon receipt of the refund when it relates to prior years expenditure and when the funds accrued are no longer required for the completion of the project.

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2D – Royalties</b>				
Coarse grains	3,820	1,855	3,820	1,855
Grain legumes	2,393	913	2,393	913
Oilseeds	148	227	148	227
Wheat	4,958	4,822	4,958	4,822
Other	329	48	329	48
<b>Total royalties</b>	<b>11,648</b>	<b>7,865</b>	<b>11,648</b>	<b>7,865</b>

## Accounting Policy

Royalties are recognised when they can be reliably measured and when they are entitled to be received by the Corporation.



	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2E – Grants Income</b>				
<b>Total grants income</b>	<b>2,492</b>	<b>527</b>	<b>2,492</b>	<b>527</b>

## Accounting Policy

Grants income is revenue paid to the Corporation for the purpose of funding specific research and development projects. Grants and other non-reciprocal contributions from non-government entities are recognised as revenue when the Corporation obtains control over the assets comprising the contributions. Control is normally obtained upon receipt. Grants from government entities are recognised on a systematic basis over the periods in which the Corporation recognises as expenses the related costs for which the grants are intended.

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2F – Other Revenue</b>				
Levy penalties	191	150	191	150
Advertising income	174	232	174	232
Publications revenue	15	16	15	16
Net proceeds on disposal of IP	-	366	-	366
Car park rental	10	47	10	47
Other income	23	6	23	6
<b>Total other revenue</b>	<b>413</b>	<b>817</b>	<b>413</b>	<b>817</b>

## Gains

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2G – Other Gains</b>				
Gain on sale of investments	6,063	290	6,063	290
Gain on sale of plant and equipment	7	-	7	-
<b>Total gain from sale of assets</b>	<b>6,070</b>	<b>290</b>	<b>6,070</b>	<b>290</b>
Change in fair value through profit or loss	3,395	6,113	3,395	6,113
<b>Total other gains</b>	<b>9,465</b>	<b>6,403</b>	<b>9,465</b>	<b>6,403</b>

## Accounting Policy

### *Gain on disposal of investments*

Gains from the disposal of investments are recognised when control of the asset has passed to the buyer.

	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>Note 1.2H – Revenue from Government</b>				
Department of Agriculture <i>PIRD Act 1989</i> contribution	<b>73,285</b>	<b>70,225</b>	<b>73,285</b>	<b>70,225</b>



## Accounting Policy

### Revenue from Government

Revenue paid to the Corporation under Section 32 of the *Primary Industries Research and Development Act 1989*, representing 0.5% of the three-year (current and previous 2 years) moving average of gross value of production of grains, is for the purpose of funding research and development activities. Revenues from Government are recognised when they are entitled to be received by the Corporation.

Funding received or receivable from non-corporate Commonwealth entities (appropriated to the non-corporate Commonwealth entity as a corporate Commonwealth entity payment item for payment to the Corporation) is recognised as Revenue from Government by the Corporation unless the funding is in the nature of an equity injection or loan.

### 2.1: Financial Assets

	2017 \$'000	2016 \$'000
<b>2.1A – Cash and Cash Equivalents</b>		
Interest bearing cheque account	9,527	6,612
Business online saver account	6	6
<b>Total cash and cash equivalents</b>	<b>9,533</b>	<b>6,618</b>
<b>2.1B – Trade and Other Receivables</b>		
<b>Goods and services receivables</b>		
Goods and services	23,580	20,484
Other	2,531	8,572
<b>Total goods and services receivables</b>	<b>26,111</b>	<b>29,056</b>
<b>Other receivables</b>		
Security deposits receivable	35	22
Convertible notes receivable	2,990	2,875
Loans receivable	19,071	17,891
<b>Total other receivables</b>	<b>22,096</b>	<b>20,788</b>
<b>Total trade and other receivables (net)</b>	<b>48,207</b>	<b>49,844</b>

No indicators of impairment were found for trade and other receivables.

In July 2015, the Corporation entered into a Convertible Note Agreement with InterGrain Pty Ltd for the amount of \$3,000,000 (principal). The Corporation is entitled to receive the equivalent of the 12 month Australian Bank Bill Swap Reference Rate (at each 30 June anniversary) plus 2% based on the principal. The notes are contracted to mature 84 months after the issue date, at which time the principal and interest is to be repaid, unless a mandatory, automatic or voluntary conversion to ordinary shares occurs prior to maturity. The embedded derivative component of the convertible note was separately brought to account on inception, with the fair value movement recognised at each reporting date through profit or loss disclosed at note 1.2G. The embedded derivative component is disclosed at note 2.1D.

At the end of the reporting period, the Corporation had loans receivable totalling \$19,071,303. The loans were made to two entities in which the Corporation is an equity holder. The maturity of the loans varies from 30 June 2018 (\$17,890,568) to 15 July 2022 (\$1,180,735).



## Accounting Policy

### *Loans and Receivables*

Trade receivables and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Loans and receivables are measured at amortised cost using the effective interest method less impairment.

	2017 \$'000	2016 \$'000
<b>2.1C – Investments in Managed Funds</b>		
<b>Fixed Interest Individually Managed Funds</b>	<b>158,032</b>	156,141
At market value		
<b>Cash Management Individually Managed Funds</b>	<b>67,167</b>	40,868
At market value		
<b>Total investments</b>	<b>225,199</b>	197,009

### *Individually managed funds*

The funds are available at call. Interest rates will vary to reflect varying market interest rates.

### *Ministerial approval*

The Corporation has received approval under paragraph 59(1)(b)(iii) of the *Public Governance, Performance and Accountability Act 2013* to hold the investments listed above.

	2017 \$'000	2016 \$'000
<b>2.1D – Investments – Other</b>		
<b>Shares in unlisted companies</b>		
Australian Grain Technologies Pty Ltd	11,386	11,386
Allowance for impairment	(7,171)	(7,171)
	<b>4,215</b>	4,215
Australian Centre for Plant Functional Genomics Pty Ltd	-	21
Allowance for impairment	-	(21)
	<b>-</b>	-
InterGrain Pty Ltd	8,630	7,200
Allowance for impairment	(8,630)	(7,200)
	<b>-</b>	-
<b>Other investments</b>		
Convertible notes – embedded derivative	203	-
	<b>203</b>	-
<b>Gross Investments – Other</b>	<b>20,219</b>	18,607
<b>Total allowance for impairment</b>	<b>(15,801)</b>	(14,392)
<b>Net investments - Other</b>	<b>4,418</b>	4,215

The shares held are ordinary shares.

All such investments are expected to be recovered in more than 12 months.

## Accounting Judgements and Estimates

The Corporation has made the following estimate:

- The valuation methodology of the embedded derivative component of the convertible note utilised a Binomial Option Pricing Model. The valuation was undertaken by an independent, qualified and appropriately experienced expert.



## 2.2: Non-Financial Assets

### 2.2A – Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment and Intangibles

Reconciliation of the opening and closing balances of property, plant and equipment and intangibles – 2017

	LEASEHOLD LAND \$'000	BUILDINGS ON LEASEHOLD LAND \$'000	TOTAL LAND AND BUILDINGS ON LEASEHOLD LAND \$'000	OTHER PROPERTY, PLANT & EQUIPMENT \$'000	INTANGIBLES \$'000	TOTAL \$'000
<b>As at 1 July 2016</b>						
Gross book value	742	7,157	7,899	1,119	5,636	14,654
Accumulated depreciation and impairment	-	(710)	(710)	(341)	(1,854)	(2,905)
<b>Net book value 1 July 2016</b>	<b>742</b>	<b>6,447</b>	<b>7,189</b>	<b>778</b>	<b>3,782</b>	<b>11,749</b>
Additions:						
By purchase	-	86	86	119	3,270	3,475
Revaluations and impairment recognised in other comprehensive income	3	(479)	(476)	-	-	(476)
Depreciation and amortisation expense	-	(516)	(516)	(274)	(699)	(1,489)
Other movements						
Work in progress	-	-	-	-	(1,828)	(1,828)
Disposals:						
Other	-	-	-	(8)	-	(8)
<b>Net book value 30 June 2017</b>	<b>745</b>	<b>5,538</b>	<b>6,283</b>	<b>615</b>	<b>4,525</b>	<b>11,423</b>
<b>Net book value as at 30 June 2017 represented by:</b>						
Gross book value	745	6,629	7,374	1,213	7,016	15,603
Accumulated depreciation, amortisation and impairment losses	-	(1,091)	(1,091)	(598)	(2,491)	(4,180)
<b>Net book value 30 June 2017</b>	<b>745</b>	<b>5,538</b>	<b>6,283</b>	<b>615</b>	<b>4,525</b>	<b>11,423</b>



A revaluation decrement was recognised during the reporting period in relation to land and buildings. No other indicators of impairment were found for property, plant and equipment and intangibles.

The Corporation intends to actively market land and buildings assets for sale during the 2017-18 financial year. No other property, plant or equipment and intangibles are expected to be sold or disposed of within the next 12 months.

## Revaluation of non-financial assets

All revaluations were conducted in accordance with the revaluation policy stated below. A formal revaluation of land and buildings was conducted at 30 June 2017 by Jones Lang LaSalle (ACT) Pty Limited.

## Accounting Policy

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken.

Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition.

### *Asset Recognition Threshold*

Purchases of property, plant and equipment are recognised initially at cost in the statement of financial position, except for purchases costing less than \$2,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located. This is particularly relevant to 'make good' provisions in property leases taken up by the Corporation where there exists an obligation to restore the property to its original condition. These costs are included in the value of the Corporation's leasehold improvements with a corresponding provision for the 'make good' recognised.

### *Revaluations*

Following initial recognition at cost, property, plant and equipment are carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depend upon the volatility of movements in market values for the relevant assets.

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of asset revaluation reserve except to the extent that it reversed a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets are recognised directly in the surplus/deficit except to the extent that they reversed a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset is restated to the revalued amount.

### *Depreciation*

Depreciable property, plant and equipment assets are written-down to their estimated residual values over their estimated useful lives to the Corporation using, in all cases, the straight-line method of depreciation.

Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.



Depreciation rates applying to each class of depreciable asset are based on the following useful lives:

	2017	2016
Buildings on leasehold land	25 years	25 years
Other infrastructure, plant & equipment	3 to 12 years	3 to 12 years

### *Assets purchased with research payments*

Tangible assets purchased with research payments may revert to the Corporation at the end of the research project period and will be accounted for appropriately at that date. During the financial year no research assets reverted to the Corporation (2016: \$NIL).

### *Impairment*

All assets were assessed for impairment at 30 June 2017. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to disposal and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the Corporation were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

### *Derecognition*

An item of property, plant and equipment is derecognised upon disposal or when no further economic benefits are expected from its use or disposal.

### *Intangibles*

The Corporation's intangibles comprise software and intellectual property.

Software is carried at cost less accumulated amortisation and accumulated impairment losses. Software is amortised on a straight-line basis over its anticipated useful life as follows:

	2017	2016
Information management system	2.5 years	2.5 years
Other software	4 years	4 years

### *Development costs*

Research costs are expensed when incurred. An intangible asset arising from development expenditure is only recognised when technical feasibility studies identify that the expenditure will deliver future economic benefits and these benefits can be measured reliably. Other development expenditure is recognised in the Statement of Comprehensive Income as an expense when incurred.

Following initial recognition of development expenditure, the cost model is applied requiring the asset to be carried at cost less any accumulated amortisation and accumulated impairment losses.

All intangible assets were assessed for indications of impairment as at 30 June 2017.



	2017 \$'000	2016 \$'000
<b>2.2B – Other Non-Financial Assets</b>		
Accrued interest	29	22
Accrued income	7,358	782
Prepayments	1,048	157
<b>Total other non-financial assets</b>	<b>8,435</b>	<b>961</b>

All non-financial assets with the exception of the interest accrued on convertible notes and loans are expected to be recovered in no more than 12 months.

No indicators of impairment were found for other non-financial assets.

### *Accrued interest*

The interest rates range from 0.65% to 1.50% (2016: 0.90% to 2.00%) and the frequency of payments is monthly.

## 2.3: Assets Held for Sale

	2017 \$'000	2016 \$'000
The following assets have been classified as held for sale:		
Investments – shares in unlisted companies	-	1,461
<b>Total assets held for sale</b>	<b>-</b>	<b>1,461</b>

## 2.4: Payables

	2017 \$'000	2016 \$'000
<b>2.4A – Suppliers</b>		
Trade creditors – external parties	1,331	808
Accrued expenses – external parties	806	2,594
<b>Total supplier payables</b>	<b>2,137</b>	<b>3,402</b>

Settlement is usually made within 30 days apart from those payables with specific settlement terms after 30 days.

	2017 \$'000	2016 \$'000
<b>2.4B – Research and Development</b>		
Research and development payables	91,536	72,934
<b>Total research and development payables</b>	<b>91,536</b>	<b>72,934</b>
<b>2.4C – Other Payables</b>		
Unearned grant income – related parties	4,220	4,064
<b>Total other payables</b>	<b>4,220</b>	<b>4,064</b>



## 2.5: Provisions

	2017 \$'000	2016 \$'000
<b>2.5A – Employee Provisions</b>		
Leave	1,732	2,028
<b>Total employee provisions</b>	<b>1,732</b>	<b>2,028</b>

### Accounting Policy

Liabilities for 'short-term employee benefits' (as defined in AASB 119 *Employee Benefits*) and termination benefits due within twelve months of the end of the reporting period are measured at their nominal amounts.

#### Leave

The liability for employee benefits includes provision for annual leave and long service leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that applied at the time the leave is taken, including the Corporation's employer superannuation contribution rates, to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by using the Australian Government shorthand method. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

#### Superannuation

The Corporation's staff are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS), the PSS Accumulation Plan (PSSap), AustralianSuper or an approved superannuation scheme of their choice.

The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance's administered schedules and notes.

For CSS and PSS members, the Corporation makes contributions based on the rates determined by an actuary to be sufficient to meet the current costs to the Government. The Corporation accounts for the contributions as if they were contributions to defined contribution plans.

For AustralianSuper and other approved superannuation schemes, the Corporation contributes a minimum of 9.5% of superannuable salaries.

As at 30 June, superannuation contributions payable were \$NIL (2016: \$NIL).

#### Separation and Redundancy

Provision is made for separation and redundancy benefit payments. The entity recognises a provision for termination when it has developed a detailed formal plan for the terminations and has informed those employees affected that it will carry out the terminations.



	LEASE INCENTIVE \$'000	PROVISION FOR MAKE GOOD \$'000	TOTAL \$'000
<b>2.5B – Other Provisions</b>			
As at 1 July 2016	1,399	542	<b>1,941</b>
Amounts used	(179)	-	<b>(179)</b>
<b>Total as at 30 June 2017</b>	<b>1,220</b>	<b>542</b>	<b>1,762</b>

The Corporation currently has an agreement for the leasing of premises which have provisions requiring the Corporation to restore the premises to their original condition at the conclusion of the lease. The Corporation has made a provision to reflect the present value of this obligation.

### 3.1: Key Management Personnel Remuneration

Key management personnel are those persons having authority and responsibility for planning, directing and controlling the activities of the entity, directly or indirectly, including any director (whether executive or otherwise) of that entity. The Corporation has determined the key management personnel to be the Directors, including the Managing Director, and the Deputy CEO. Key management personnel remuneration is reported in the table below:

	CORPORATION	
	2017 \$	2016 \$
Short-term employee benefits	<b>1,027,990</b>	991,496
Post-employment benefits	<b>93,891</b>	90,633
Other long-term employee benefits	<b>67,884</b>	64,656
<b>Total key management personnel remuneration expenses<sup>1</sup></b>	<b>1,189,765</b>	1,146,785

The total number of key management personnel that are included in the above table are 10 individuals (2016: 10 individuals).

<sup>1</sup> The above key management personnel remuneration excludes the remuneration and other benefits of the Portfolio Minister. The Portfolio Minister's remuneration and other benefits are set by the Remuneration Tribunal and are not paid by the entity.

## 3.2: Related Party Disclosures

### *Related party relationships:*

The entity is an Australian Government controlled entity. Related parties to this entity are Directors, Key Management Personnel including the Portfolio Minister, and other Australian Government entities.

### *Transactions with related parties:*

Given the breadth of Government activities, related parties may transact with the government sector in the same capacity as ordinary citizens. Such transactions include the payment or refund of taxes, receipt of a Medicare rebate or higher education loans. These transactions have not been separately disclosed in this note.

Several directors of the Corporation and their close family members hold directorships with other organisations. Any transactions between the Corporation and those organisations or any dealings between the Corporation and the Directors and their close family members individually are conducted using commercial and arms-length principles.

The Corporation made payments of \$638,868 to AgCommunicators Pty Ltd for communication services. At the time of payment a Director of AgCommunicators Pty Ltd was a close family member of a Director of the Corporation. Transactions have been conducted on normal commercial terms.

No loans were made to the Directors or Director-related entities during the reporting period.

## 4.1: Financial Instruments

	2017 \$'000	2016 \$'000
<b>4.1A – Categories of Financial Instruments</b>		
<b>Financial Assets</b>		
<b>Loans and receivables</b>		
Cash and cash equivalents	9,533	6,618
Trade and other receivables	45,676	41,272
<b>Total loans and receivables</b>	<b>55,209</b>	<b>47,890</b>
<b>Available-for-sale financial assets</b>		
Shares in unlisted companies	4,215	4,215
<b>Total available-for-sale financial assets</b>	<b>4,215</b>	<b>4,215</b>
<b>Financial assets at fair value through profit or loss</b>		
Managed funds	225,199	197,009
Embedded derivative	203	-
<b>Total financial assets at fair value through profit or loss</b>	<b>225,402</b>	<b>197,009</b>
<b>Total financial assets</b>	<b>284,826</b>	<b>249,114</b>
<b>Financial Liabilities</b>		
<b>Financial liabilities measured at amortised cost</b>		
Payables	92,867	73,742
<b>Total financial liabilities measured at amortised cost</b>	<b>92,867</b>	<b>73,742</b>
<b>Total financial liabilities</b>	<b>92,867</b>	<b>73,742</b>



## Accounting Policy

### *Financial assets*

The Corporation classifies its financial assets in the following categories:

- a) financial assets at fair value through profit or loss;
- b) held-to-maturity investments;
- c) available-for-sale financial assets; and
- d) loans and receivables.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Financial assets are recognised and derecognised upon trade date.

### *Effective interest method*

Income is recognised on an effective interest rate basis except for financial assets at fair value through profit or loss.

### *Financial assets at fair value through profit or loss*

Financial assets are classified as financial assets at fair value through profit or loss where the financial assets:

- a) have been acquired principally for the purpose of selling in the near future;
- b) are derivatives that are not designated and effective as a hedging instrument; or
- c) are parts of an identified portfolio of financial instruments that the Corporation manages together and has a recent actual pattern of short-term profit-taking.

Assets in this category are classified as current assets.

Financial assets at fair value through profit or loss are stated at fair value, with any resultant gain or loss recognised in profit or loss. The net gain or loss recognised in profit or loss incorporates any interest earned on the financial asset.

### *Available-for-sale financial assets*

Available-for-sale financial assets are non-derivatives that are either designated in this category or not classified in any of the other categories.

Available-for-sale financial assets are recorded at fair value. Gains and losses arising from changes in fair value are recognised directly in reserves (equity) with the exception of impairment losses. Interest is calculated using the effective interest method and foreign exchange gains and losses on monetary assets are recognised directly in profit or loss. Where the asset is disposed of or is determined to be impaired, part (or all) of the cumulative gain or loss previously recognised in the reserve is included in surplus or deficit for the period.

Where a reliable fair value cannot be established for unlisted investments in equity instruments, these instruments are valued at cost. The Corporation holds shares in the following unlisted companies:

- Australian Grain Technologies Pty Ltd (holding: 39%);
- InterGrain Pty Ltd (holding: 38%).

These companies conduct R&D for the development of new crop varieties and are responsible for the commercialisation of those varieties. The success and ability to generate future economic benefits are subject to uncertainty and the Corporation believes that this will impair the carrying values of the investments.



The Corporation has established an allowance for impairment to record a reduction in the value of each of these investments based on the Corporation's estimate of the trading performance and cash flows of each company. A review of the trading performances will be performed annually. If there is objective evidence that an impairment loss has been incurred, the amount of the impairment loss is the difference between the carrying amount of the assets and the present value of the estimated future cash flows discounted at the current market rate for similar assets. As the investments' carrying value uses the fair value exemption under *AASB139 Financial Instruments*, the allowance for impairment cannot be reversed. The allowance for each investment is disclosed at note 2.1D.

### *Impairment of financial assets*

Financial assets are assessed for impairment at the end of each reporting period.

*Financial assets carried at amortised cost* – if there is objective evidence that an impairment loss has been incurred for loans and receivables or held-to-maturity investments held at amortised cost, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the asset's original effective interest rate. The carrying amount is reduced by way of an allowance account. The loss is recognised in the Statement of Comprehensive Income.

*Available-for-sale financial assets* – if there is objective evidence that an impairment loss on an available-for-sale financial asset has been incurred, the amount of the difference between its cost, less principal repayments and amortisation, and its current fair value, less any impairment loss previously recognised in expenses, is transferred from equity to the Statement of Comprehensive Income.

*Financial assets carried at cost* – if there is objective evidence that an impairment loss has been incurred, the amount of the impairment loss is the difference between the carrying amount of the asset and the present value of the estimated future cash flows discounted at the current market rate for similar assets.

## **Financial Liabilities**

Financial liabilities are classified as either financial liabilities at 'fair value through profit or loss' or other financial liabilities. Financial liabilities are recognised and derecognised upon 'trade date'.

### *Financial liabilities at fair value through profit or loss*

Financial liabilities at fair value through profit or loss are initially measured at fair value. Subsequent fair value adjustments are recognised in profit or loss. The net gain or loss recognised in profit or loss incorporates any interest paid on the financial liability.

### *Other financial liabilities*

Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. These liabilities are subsequently measured at amortised cost using the effective interest method, with interest expense recognised on an effective interest basis.

Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).



	CONSOLIDATED		CORPORATION	
	2017 \$'000	2016 \$'000	2017 \$'000	2016 \$'000
<b>4.1B – Net Gains or Losses on Financial Assets</b>				
<b>Loans and receivables</b>				
Interest revenue	552	1,016	485	963
<b>Net gain on loans and receivables</b>	<b>552</b>	<b>1,016</b>	<b>485</b>	<b>963</b>
<b>Available-for-sale financial assets</b>				
Impairment	(1,430)	(1,138)	(1,430)	(1,138)
<b>Net (loss) on available-for-sale financial assets</b>	<b>(1,430)</b>	<b>(1,138)</b>	<b>(1,430)</b>	<b>(1,138)</b>
<b>Financial assets at fair value through profit or loss</b>				
Change in fair value	203	(226)	203	(226)
<b>Net (loss) on financial assets at fair value through profit and loss</b>	<b>203</b>	<b>(226)</b>	<b>203</b>	<b>(226)</b>
<b>Financial assets at fair value through profit or loss</b>				
Change in fair value	3,192	6,113	3,192	6,113
<b>Net gain on financial assets at fair value through profit and loss</b>	<b>3,192</b>	<b>6,113</b>	<b>3,192</b>	<b>6,113</b>
<b>Net gain on financial assets</b>	<b>2,517</b>	<b>5,765</b>	<b>2,450</b>	<b>5,712</b>

There was no net gain or loss on financial liabilities.

## Note 4.2: Fair Value Measurements

### Accounting Policy

The Corporation measures its managed fund investments using Level 1 inputs, that is, using quoted prices in active markets for identical assets that the Corporation can access at measurement date.

The Corporation measures the embedded derivative component of convertible notes by using a Binomial Option Pricing Model. Inputs into the model include both Level 2 and Level 3 data, that is, using observable and unobservable data. The valuation at each reporting date is undertaken by an independent, qualified and appropriately experienced expert.

Valuations of non-financial assets are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depend upon the volatility of movements in market values for the relevant assets. Non-financial assets are measured using a range of Level 2 and Level 3 inputs.

The Corporation measured its leasehold land and buildings at the reporting date using Level 2 inputs. The Corporation engaged an independent expert to conduct the valuation of its leasehold land and buildings at 30 June 2017. The expert used the Capitalisation Approach and Market Approach in determining the valuation.

The Corporation measured its Leasehold improvements using Level 3 inputs at the reporting date, using the Depreciated replacement cost valuation methodology.

The Corporation measured its Other property, plant and equipment using Level 2 inputs, using adjusted market transactions as a basis.



**FAIR VALUE MEASUREMENTS AT THE END OF THE REPORTING PERIOD**

	2017 \$'000	2016 \$'000
<b>Note 4.2A – Fair Value Measurement</b>		
<b>Financial assets</b>		
Investments in managed funds <sup>1</sup>	225,199	197,009
Convertible notes – embedded derivative <sup>1</sup>	203	-
<b>Total financial assets</b>	<b>225,402</b>	<b>197,009</b>
<b>Non-financial assets</b>		
Leasehold land <sup>1</sup>	745	742
Building on leasehold land <sup>1</sup>	2,755	3,368
Leasehold improvements <sup>1</sup>	2,783	3,079
Other property, plant and equipment <sup>1</sup>	615	778
<b>Total non-financial assets</b>	<b>6,898</b>	<b>7,967</b>
<b>Total fair value measurements of assets in the Statement of Financial Position</b>	<b>232,300</b>	<b>204,976</b>

<sup>1</sup> No change in valuation technique occurred during the period. The revaluation of non-financial assets was conducted on an equivalent basis to the prior valuation conducted as at 30 June 2014.





Photo: Brad Collis

# Appendix

The following tables summarise the total expenditure allocated against the Australian Government's Science and Research Priorities and Rural Research, Development and Extension Priorities in 2016–17. The allocation of funds is shown in both dollar and percentage terms for each investment theme.





Table A1: Expenditure on Science and Research Priorities

THEME	FOOD	SOIL AND WATER	TRANSPORT	CYBERSECURITY	ENERGY	RESOURCES	ADVANCED MANUFACTURING	ENVIRONMENTAL CHANGE	HEALTH	OTHER <sup>a</sup>	TOTAL
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Meeting market requirements	7.86										7.86
Improving crop yield	38.43										38.43
Protecting your crop	53.92										53.92
Advancing profitable farming systems		39.24									39.24
Improving your farm resource base		13.91						0.02			13.93
Building skills and capacity		3.36					3.35				6.71
Foundational activities		14.56					0.01			3.84	18.40
R&D management										19.63	19.63
<b>Total \$m</b>	<b>100.21</b>	<b>71.06</b>					<b>3.36</b>	<b>0.02</b>		<b>23.47</b>	<b>198.12</b>
	%	%	%	%	%	%	%	%	%	%	%
Meeting market requirements	3.97										3.97
Improving crop yield	19.40										19.40
Protecting your crop	27.21										27.21
Advancing profitable farming systems		19.80									19.80
Improving your farm resource base		7.02						0.01			7.03
Building skills and capacity		1.70						1.69			3.39
Foundational activities		7.35					0.00			1.94	9.29
R&D management										9.91	9.91
<b>Total %</b>	<b>50.58</b>	<b>35.87</b>					<b>1.69</b>	<b>0.01</b>		<b>11.85</b>	<b>100.00</b>

<sup>a</sup> Other includes a number of investments that relate to commercialisation, impact assessment and evaluation of the portfolio.

Table A2: Expenditure on Rural Research, Development and Extension Priorities

THEME	ADVANCED TECHNOLOGY	BIOSECURITY	SOIL, WATER AND MANAGING NATURAL RESOURCES	ADOPTION OF R&D	OTHER <sup>a</sup>	TOTAL
	\$m	\$m	\$m	\$m	\$m	\$m
Meeting market requirements				7.86		7.86
Improving crop yield	38.43					38.43
Protecting your crop		53.92				53.92
Advancing profitable farming systems			37.90	1.34		39.24
Improving your farm resource base			13.50	0.43		13.93
Building skills and capacity				6.71		6.71
Foundational activities				2.34	16.06	18.40
R&D management					19.63	19.63
<b>Total \$m</b>	<b>38.43</b>	<b>53.92</b>	<b>51.40</b>	<b>18.68</b>	<b>35.69</b>	<b>198.12</b>
	%	%	%	%	%	%
Meeting market requirements				3.97		3.97
Improving crop yield	19.40					19.40
Protecting your crop		27.21				27.21
Advancing profitable farming systems			19.13	0.68		19.81
Improving your farm resource base			6.81	0.22		7.03
Building skills and capacity				3.39		3.39
Foundational activities				1.18	8.10	9.28
R&D management					9.91	9.91
<b>Total %</b>	<b>19.40</b>	<b>27.21</b>	<b>25.94</b>	<b>9.44</b>	<b>18.01</b>	<b>100.00</b>

<sup>a</sup> Other includes a number of investments that relate to commercialisation, impact assessment and evaluation of the portfolio.





Photo: Brad Collis

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# Abbreviations list

AEGIC	Australian Export Grains Innovation Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
GRDC	Grains Research and Development Corporation
Minister, the	Minister for Agriculture and Water Resources
PGPA Act	<i>Public Governance, Performance and Accountability Act 2013</i>
PIRD Act	<i>Primary Industries Research and Development Act 1989</i>
R&D	research and development
RD&E	research, development and extension
RWA	Russian wheat aphid
WLYP	water-limited yield potential



# Compliance index

REQUIREMENT	SOURCE	PART OF THE REPORT
<b>Primary Industries Research and Development Act 1989 (PIRD Act)</b>		
R&D activities	Paragraph 28(a)(i)	14–45
Marketing activities funded by levy	Paragraph 28(a)(ia)	None to report
Expenditure on R&D activities	Paragraph 28(a)(ii)	iii, 18, 22, 26, 31, 36, 41
Impact of R&D activities on the grains industry	Paragraph 28(a)(ii)	14–45
Revisions of the R&D plan	Paragraph 28(a)(iii)	None to report
Agreements under sections 13 and 14	Paragraph 28(a)(iv)	None to report
Patents and commercialisation	Paragraph 28(a)(v)	49–51
Companies	Paragraph 28(a)(vi) and (vii)	50
Real property	Paragraph 28(a)(viii)	None to report
Assessment of operations	Paragraph 28(b)	2–5, 14–45
Contribution to the objects of the Act	Paragraph 28(c)	9, 14–45
Sources and expenditure of funds	Paragraph 28(d)	iii, iv, 10, 62, 66–93, 96–97
<b>Public Governance, Performance and Accountability Rule 2014</b>		
Approval of the report by directors	Section 17BB	Letter of transmittal
Parliamentary standards of presentation	Section 17BC	Throughout
Plain English and clear design	Section 17BD	Throughout
Enabling legislation	Paragraph 17BE(a)	60
Legislated objects and functions	Paragraph 17BE(b)(i)	9
Purpose	Paragraph 17BE(b)(ii)	14
Responsible minister	Paragraph 17BE(c)	60
Ministerial directions	Paragraph 17BE(d) and (f)	60
Policy orders	Paragraphs 17BE(e) and (f)	60
Annual performance statements	Paragraph 17BE(g)	14–17
Significant issues related to financial compliance	Paragraph 17BE(h) and (i)	60
Information on members of the accountable authority	Paragraph 17BE(j)	54–57, 59
Organisational structure	Paragraph 17BE(k)	6–7
Location	Paragraph 17BE(l)	10
Governance	Paragraph 17BE(m)	57–58, 61–62
Related entity transactions	Paragraphs 17BE(n) and (o)	Financial statements
Significant activities and changes	Paragraph 17BE(p)	60
Judicial decisions or decisions of administrative tribunals	Paragraph 17BE(q)	62
Reports by the Auditor-General, a parliamentary committee, the Commonwealth Ombudsman or the Office of the Australian Information Commissioner	Paragraph 17BE(r)	62
Information from subsidiaries	Paragraph 17BE(s)	Financial statements



REQUIREMENT	SOURCE	PART OF THE REPORT
Indemnity and insurance	Paragraph 17BE(t)	62
Compliance index	Paragraph 17BE(u)	101–102
<b>Funding Agreement 2015–19</b>		
Implementation of strategies under the National Primary Industries Research, Development and Extension Framework	Paragraph 11.10(a)	9
Rationale for mix of RD&E investments	Paragraph 11.10(b)	46
Extension activities	Paragraph 11.10(c)	14–45
Collaborations not covered by ss. 13 and 14 of the PIRD Act	Paragraph 11.10(d)	None to report
Sources of income	Paragraph 11.10(e)	Financial statements
Costs of R&D and marketing	Paragraph 11.10(f)	Financial statements
Implementation of the strategic R&D plan	Paragraph 11.10(g)	18–45
Efficiency and effectiveness of investments	Paragraph 11.10(h)	46–48
Implementation of government priorities and guidelines	Paragraph 11.10(i)	14–51
Consultation with representative organisations	Paragraph 11.10(j)	61
Other matters notified by the Commonwealth	Paragraph 11.10(k)	None to report
<b>Other reporting requirements</b>		
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<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Section 516A	62–63
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ISSN 1037–4531

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## Production notes

<b>Concepts, text and research</b>	GRDC
<b>Editing and indexing</b>	WordsWorth Writing, Canberra
<b>Design and typesetting</b>	giraffe.com.au
<b>Printing</b>	CanPrint Communications

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