



Australian Government

Grains Research and  
Development Corporation

# Strategic Research & Development Plan 2012-17

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

Relationships between PIERD Act objectives, government and industry priorities, GRDC RD&E investment themes and strategies, and the GRDC outcome and vision

Government and industry objectives	Australian Government priorities			Industry priorities		
	<i>Primary Industries and Energy Research and Development Act 1989</i>	National Research Priorities	Rural R&D Priorities	Grains Industry National RD&E Strategy	Industry Priorities	
	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  Improved accountability for expenditure on R&D activities	An environmentally sustainable Australia  Promote and maintain good health  Frontier technologies for building and transforming Australian industries  Safeguard Australia	Productivity and adding value  Supply chain and markets  Climate variability and climate change  Biosecurity  Innovation skills  Technology	Improved processes to build on existing national collaboration  Effective relationship models for private-public coexistence  National research programs, national centres of research capacity and regional networks of applied RD&E under the ‘major-support-link’ framework  National capability planning for human and physical infrastructure  Better and ongoing alignment of stakeholder priorities and RD&E resource allocation	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	1 Meeting market requirements	2 Improving crop yield	3 Protecting your crop	4 Advancing profitable farming systems	5 Improving your farm resource base	6 Building skills and capacity
Intermediate outcomes (5 years)	<ul style="list-style-type: none"><li>- Understanding market opportunities for Australian grain.</li><li>- Crop and variety selection aligned with market requirements.</li><li>- Crop production aligned with market requirements.</li><li>- Grain harvest and storage practices aligned with market requirements.</li></ul>	<ul style="list-style-type: none"><li>- Genetic yield potential and stability improvement of cereal varieties.</li><li>- Genetic yield potential and stability improvement of pulse varieties.</li><li>- Genetic yield potential and stability improvement of canola varieties.</li></ul>	<ul style="list-style-type: none"><li>- Effective, sustainable and efficient management of weeds.</li><li>- Effective, sustainable and efficient management of vertebrate and invertebrate pests.</li><li>- Effective, sustainable and efficient management of cereal rusts.</li><li>- Effective, sustainable and efficient management of cereal (non-rust), pulse and oilseed fungal pathogens.</li><li>- Effective, sustainable and efficient management of nematodes.</li><li>- Effective, sustainable and efficient management of viruses and bacteria.</li><li>- Biosecurity and pesticide stewardship.</li></ul>	<ul style="list-style-type: none"><li>- Knowing what is important (key business drivers).</li><li>- Responding strategically (building system benefits and rotations).</li><li>- Responding tactically (individual crop agronomy).</li></ul>	<ul style="list-style-type: none"><li>- Understanding and adapting to climate variability.</li><li>- Improving soil health.</li><li>- Managing water use on dryland and irrigated grain farms.</li><li>- Understanding and valuing biodiversity.</li><li>- Communication of sustainable production methods.</li></ul>	<ul style="list-style-type: none"><li>- Grains industry leadership and communication.</li><li>- Capacity building in the extension sector.</li><li>- Capacity building in the R&amp;D sector.</li><li>- Capacity building for grain growers.</li></ul>
Aspirational outcomes (10+ years)	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 control of weeds, pests and diseases.	Australian grain growers managing farming systems that are able to respond and adapt to changing environment 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 Outcome	Australian grain growers utilising new information and products that enhance the productivity, profitability and sustainability of growers and benefit the grains industry and wider community.					
GRDC Vision	A profitable and sustainable Australian grains industry, valued by the wider community.					

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# Vision

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

# Mission

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

# 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**.

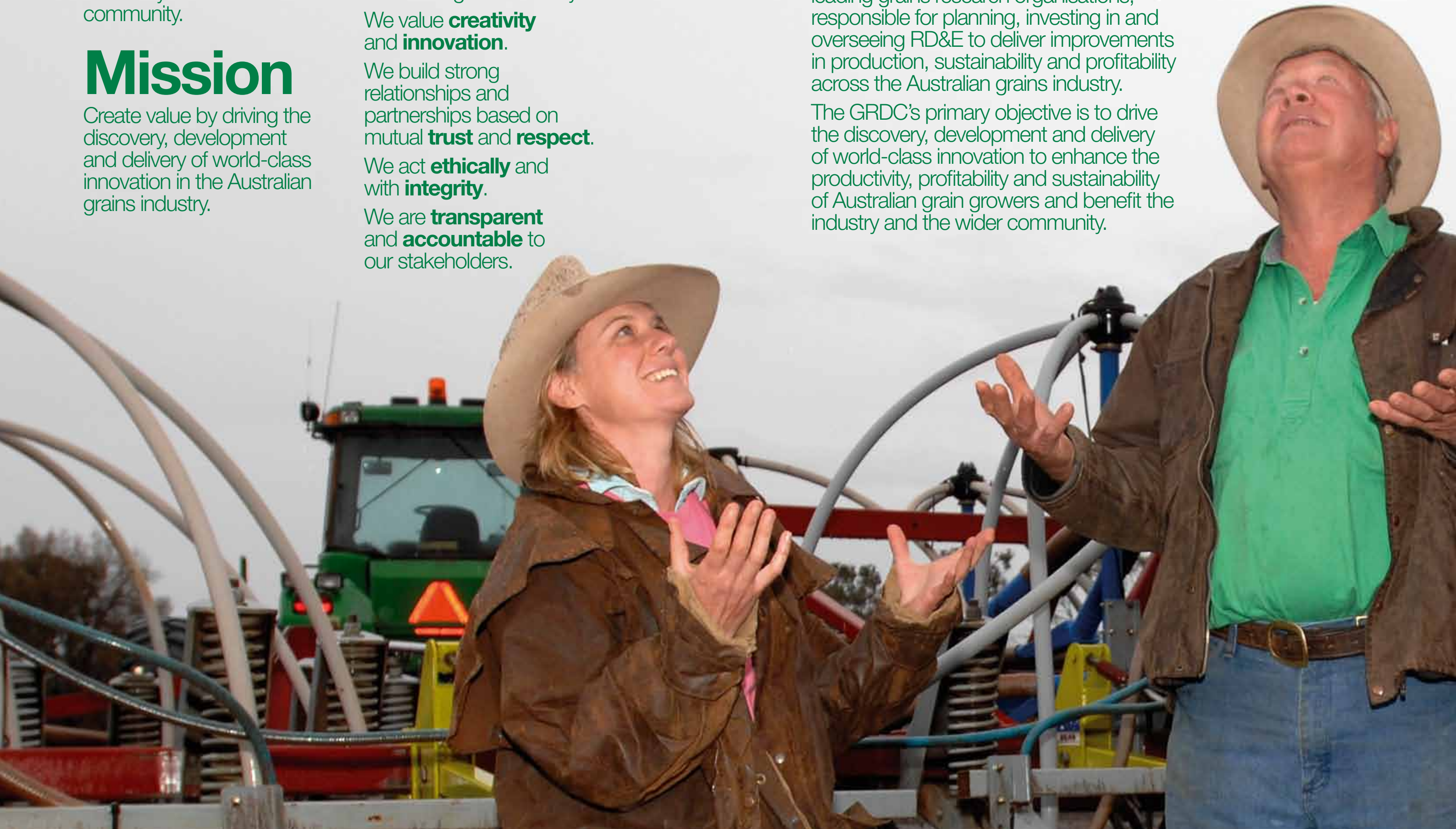
We act **ethically** and with **integrity**.

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

# The GRDC

The Grains Research and Development Corporation (GRDC) is one of the world's leading grains research organisations, responsible for planning, investing in and overseeing RD&E to deliver improvements in production, sustainability and profitability across the Australian grains industry.

The GRDC's 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.





# Introduction

Across Australia, more than 22,000 grain growers work the land to grow the best crop possible, to generate on-farm profit and to produce food for the nation and the world. Access to world-leading research, development and extension (RD&E) capability is a vital ingredient of their success.

To harness the skills, expertise and enthusiasm of the grains research community, the GRDC worked closely with its research partners, the state departments of agriculture, CSIRO, universities, grain growers and other grains industry participants to develop the comprehensive and coordinated Grains Industry National RD&E Strategy. The strategy was developed under the national RD&E framework endorsed by the Primary Industries Ministerial Council, and now guides and coordinates the efforts of research organisations in Australia.

In the context of that broader strategy, the GRDC developed this Strategic R&D Plan 2012–17. Publication of this plan also meets a statutory requirement of the *Primary Industries and Energy Research and Development Act 1989* (PIERD Act), under which the GRDC operates.

In developing this plan, the GRDC undertook extensive consultation with grain growers, the wider grains industry, the research community and government agencies to hear concerns, identify issues and determine priorities. This plan outlines how the GRDC will invest the grower levy, along with the Australian Government's contribution, in innovation for the greatest benefit of Australia's grain growers.

Delivering the outputs of research to growers is a focal point of this plan. This is because we know that the investment we make in RD&E can only benefit growers, the wider grains industry and the general community if it helps growers to do something better on their farms—improve a farming practice, act to sustain natural resources, plant a better seed, produce a more valuable grain product.

In delivering outcomes to growers, it is important that the GRDC maintains a pipeline of relevant RD&E activities. The GRDC cannot achieve this alone; continuing cooperation with our RD&E partners is essential.

The GRDC's corporate strategies are critical to successful implementation of this plan.

- It is essential that the GRDC **creates value** by investing in the industry priorities that deliver the greatest potential returns. The levy paid to the GRDC has to be the best investment growers can make to improve their business. The GRDC will both create value and demonstrate how it is delivering value to growers and government.

- The GRDC will **coordinate nationally** to reduce duplication and develop RD&E infrastructure and capability for the future. The investment strategies in this plan are built on the Grains Industry National RD&E Strategy, which in turn is driven by the concept of national research with regional development and local extension. Recognising that strong collaboration with research partners is fundamental to the delivery of RD&E, the GRDC will continue to strengthen relationships with research partners.
- The GRDC will **deliver regionally** so that growers and advisers throughout Australia have access to the best available knowledge, products and services. Growers need easy access to products and services that offer solutions to production issues or show how they can improve performance on farm.
- Australia is part of an international network and needs to **connect globally** to source new technology, ideas and capacity from around the world. The GRDC will develop new relationships with the private and public sectors to ensure that Australian grain growers have early access to production solutions and take advantage of opportunities to remain internationally competitive.
- The GRDC will **engage with growers and industry**. The new GRDC Regional Cropping Solutions networks put people on the ground in grain-growing regions throughout Australia to listen to the local needs of growers and their advisers. These networks, together with the GRDC's regional panels, staff and directors, confirm the GRDC's commitment to participate in two-way communication and strengthen relationships with all stakeholders.

The Australian Government's rural R&D and national research priorities are addressed by the GRDC investment themes described in this plan. The themes also take account of opportunities beyond the farm gate to further enhance industry performance.

This strategic plan is designed to achieve a balanced portfolio of short-, medium- and long-term objectives, and describes the strategies to achieve these objectives. It clearly outlines the GRDC's approach to investing in RD&E, ensuring that its investments address the priorities of the grains industry and the Australian Government, and effectively delivering the outcomes that industry seeks. This plan also describes how performance indicators will be used to measure the success of the strategies and their impact on the grains industry and the wider community.

We are confident that this strategic plan equips the GRDC to identify, achieve and deliver the RD&E outcomes that the Australian grains industry will need to respond to the challenges and opportunities of its business environment over the years from 2012 to 2017.



**KEITH PERRETT**  
Chair



**JOHN HARVEY**  
Managing Director





# Quick guide

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## Key elements of the Strategic R&D Plan

Priorities	Areas in which RD&E is most needed to benefit the grains industry and the wider community	<b>Industry priorities:</b> The RD&E priorities of grain growers and the wider grains industry, as identified in consultations during the development of the plan. <b>Australian Government priorities:</b> The RD&E priorities of the Australian Government, as identified in the National Research Priorities and Rural R&D Priorities. <b>Other national priorities:</b> Priorities endorsed in the Grains Industry National RD&E Strategy; cross-sectoral RD&E priorities expressed via the National Primary Industries RD&E Framework; and the National Innovation Priorities.
Themes	Themes for GRDC RD&E investment to meet the priorities	Theme 1—Meeting market requirements Theme 2—Improving crop yield Theme 3—Protecting your crop Theme 4—Advancing profitable farming systems Theme 5—Improving your farm resource base Theme 6—Building skills and capacity
Outcomes	The goals of the investment themes	<b>Intermediate outcomes:</b> The goals established for each investment theme for the life of this strategic plan. <b>Aspirational outcomes:</b> The goals established for each investment theme for the longer term. <b>GRDC Outcome:</b> ‘Australian grain growers utilising new information and products that enhance the productivity, profitability and sustainability of growers and benefit the grains industry and wider community’.
Corporate strategies	How the GRDC will implement the themes	Create value, Coordinate nationally, Deliver regionally, Connect globally, Engage with growers and industry.
Performance indicators	Measures of progress in achieving the outcomes	<b>Practice changes:</b> What needs to happen, on or off farm, to achieve the outcomes of each investment theme. <b>Key metrics:</b> Quantitative measures of practice changes.
Vision	The overarching goal of the GRDC	‘A profitable and sustainable Australian grains industry, valued by the wider community’.

# The GRDC

One of the world’s leading investors in grains research, development and extension (RD&E), the Grains Research and Development Corporation (GRDC) is responsible for planning, investing in and overseeing RD&E to deliver improvements in production, sustainability and profitability across the Australian grains industry.

## Purpose

The GRDC was founded in 1990, under the *Primary Industries and Energy Research and Development Act 1989*, to assist the Australian grains industry to:

- increase 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
- achieve sustainable use and management of natural resources
- make more effective use of the resources and skills of the community in general and the scientific community in particular
- improve accountability for expenditure on R&D activities.

The functions of the GRDC under the Act include coordinating or funding R&D activities; monitoring, evaluating and reporting on the impact of R&D activities on the grains industry and the wider community; and facilitating the dissemination, adoption and commercialisation of the results of R&D.

The GRDC does not undertake R&D itself. Rather, it relies on other organisations that have the necessary R&D capabilities to undertake the work. As an investor in RD&E, the GRDC often partners with co-funding organisations, many of which also provide RD&E services.

The GRDC’s 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.

While its focus is on delivering benefits to its primary stakeholders, Australian grain growers, the GRDC also generates outcomes from investing in RD&E that benefit other participants in the Australian grains industry value chain, the wider Australian community, and the research community in Australia and overseas.





## Funding

The GRDC is principally funded by a grower levy and Australian Government contributions.

The levy is based on the net farm gate value of the annual production 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, mung beans, navy beans, pigeon peas, cowpeas and lentils; and oilseeds—canola, sunflower, soybean, safflower and linseed.

The Australian Government's contribution is determined annually, based on the three-year rolling average of the gross value of production of the 25 leviable crops.

## Relationships

The GRDC works closely with Australian grain growers and the Australian Government, to ensure that their RD&E priorities are effectively addressed through GRDC investments. Grower interests are represented through:

- the GRDC's national and regional advisory panels
- the reporting relationships between the GRDC and Grain Producers Australia
- the proactive participation of grower groups in all aspects of RD&E
- grower directors on the GRDC's skills-based Board
- a range of GRDC-supported delivery and communication channels, such as Regional Cropping Solutions networks, grower and adviser updates, and technical workshops on specific issues.

The GRDC holds regular discussions with its portfolio department, the Department of Agriculture, Fisheries and Forestry.

Understanding the importance of RD&E expertise and communication capability in achieving its outcomes, the GRDC also maintains strong connections with its other stakeholders, particularly research partners, including state departments, CSIRO, universities, cooperative research centres, other rural R&D corporations (RDCs), and investment partners from the private sector. Links with agribusiness, including farm advisers and agronomists, are growing, both in the performance of RD&E and the delivery of products and services.

Effective partnerships enable the GRDC to leverage resources and research capability; share market knowledge, technologies and intellectual property; and reduce the risk associated with individual, sole-funder investments. The GRDC collaborates with other RDCs, and with other organisations that have an interest in the grains value chain and enterprises at the farm level that are interdependent with grain growing, to increase the return on its investment and deliver greater benefits to the Australian grain grower.

The GRDC also builds strong relationships with organisations overseas, both to broaden the resources available to the Australian grains industry and to access international RD&E efforts that offer potential benefits, such as food security, for the wider Australian community.





# Strategic planning context

The five-year period of this strategic plan will see many changes, opportunities and challenges in the operating environment of the Australian grains industry, globally and domestically.

The investment environment for primary industry RD&E is also changing, as industry, government agencies, research institutions and investors work together to strengthen collaboration and coordination and achieve better RD&E outcomes for Australia. This GRDC Strategic R&D Plan will harmonise with the implementation of the grains industry's first national RD&E strategy.

In designing this five-year strategy, the GRDC has consulted widely and considered the objectives of all its stakeholders, to develop the set of corporate strategies and investment themes that will best deliver the RD&E outcomes that the Australian grains industry has identified.

## Industry snapshot

The grains industry plays a vital role in Australia's economy. Analysis by the Department of Agriculture, Fisheries and Forestry shows that in 2010–11 grains and oilseeds comprised Australia's largest category of food exports, representing 24 percent of total agricultural exports. The grains industry also plays an important role in the health of Australia's community, through its contribution to healthy foods, food security and environmental stewardship.

Grain growing occurs across the Australian landscape, under a wide range of conditions. Despite diverse challenges, the Australian grains industry is highly productive, and competes successfully in export markets while delivering high-quality products for domestic use.

## Profile

Australian grain production is characterised by a predominance of winter cereals, produced across a wide area in a number of distinct agroecological zones with differing climate and soil characteristics and diverse management requirements. Pulses and oilseed crops are also significant, both in their own right and as break crops to assist weed, pest and disease control (and provide other benefits such as nitrogen fixation) in the dominant cereal rotation.

Geographically, the grains industry is defined by three broad agroecological regions, as described in Figure 1.



Figure 1 Australia's main grain-growing regions



### The Northern Region

Encompassing Queensland and northern New South Wales, has generally high inherent soil fertility, although there is increasing evidence that this has been run down over time. It has relatively high seasonal rainfall and production variability compared with the other two regions.

Both summer and winter crops are important for profit. Yield depends, to a significant degree, on conservation of soil moisture from summer-dominant rainfall. The Northern Region has the highest diversity of crop production, including maize, sorghum and tropical pulses as well as wheat, barley, winter-growing pulses and oilseeds.

The Northern Region is the largest source of Australia's premium hard high-protein wheat for export and domestic use. Demand for feed grains from the region's important livestock industries is a key driver of grain production.

### The Southern Region

Encompasses south-eastern Australia, including central and southern New South Wales; Victoria; Tasmania; and south-eastern South Australia.

It has a diverse suite of soils of generally low fertility and with many subsoil constraints, such as salinity, sodicity and toxic levels of some elements, although there are also some areas with very productive soils. Yield potential depends on seasonal rainfall, especially in autumn and spring, and there is less dependence on stored soil moisture than in the Northern Region.

Crop production systems are varied and include many mixed farming enterprises with significant livestock and cropping activities.

### The Western Region

Comprises the cropping areas of Western Australia, where soil fertility is generally low to very low, and yields depend on winter and spring rainfall.

In many areas, yields are low by world standards; this is compensated for by the large scale and degree of mechanisation of the enterprises. Long-term variability in seasonal rainfall and production is lower in the coastal areas than in the Northern and Southern regions.

Wheat, barley, canola and lupins are the dominant crops, with livestock enterprises in mixed farming systems often of less importance. The Western Region has a relatively small population and feed industry, and consequently exports more than 85 percent of its grain production.





## Production

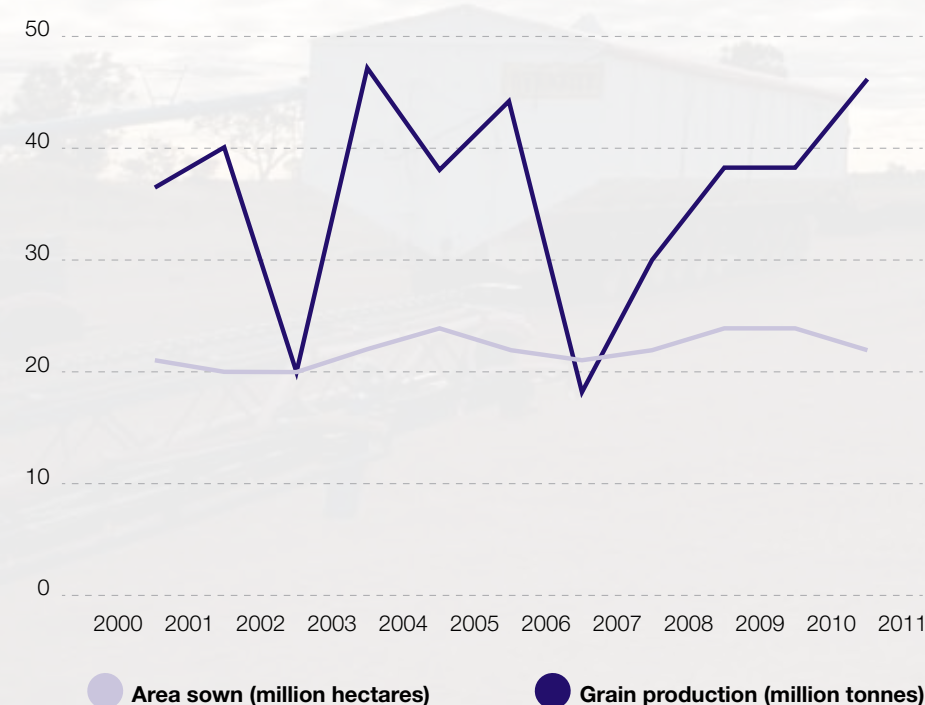
Australia's grains industry produced an average of 34 million tonnes of grain each year between 2006–07 and 2010–11. For that five-year period the average area sown to grains each year was 20 million hectares (similar to the average for the 10-year period from 2001–02 to 2010–11), and the industry had an average annual gross value of production at the farm gate of more than \$9 billion.

As Figure 2 demonstrates the average level of production masks substantial differences in yearly production statistics. These differences primarily reflect differences in rainfall. For example, while total grain production reached nearly 46 million tonnes in 2005–06, in the following year production was less than half that amount because of much lower than average rainfall in many cropping regions. Managing the risks associated with variable climate is a crucial challenge for the industry.

The grains industry's rate of growth in total factor productivity (TFP)—the ratio of the total quantity of outputs to total inputs—has been strong and sustained. From the late 1970s through to 2007–08, the Australian broadacre grains industry experienced an average annual rate of TFP growth of 1.9 percent, well above the annual rates of other rural commodities and Australian industry as a whole. TFP growth was not evenly spread within the grains industry or its regions: specialist croppers in some regions achieved rates of more than 3.5 percent per year over two decades or more, a remarkable achievement for any industry. Specific drivers of the grains industry TFP growth have included better varieties, improved agronomy, more efficient equipment, and improved business skills and decision-making, all combined in the form of grower innovation.

In recent years, TFP growth has slowed, in part reflecting the impact of a prolonged drought. Regaining the momentum in productivity growth, especially as a key response to the continuing decline in grain growers' terms of trade, is a high priority for the industry and is reflected in this plan.

Figure 2 Grain production in Australia, 2000–01 to 2010–11



Source: Australian Bureau of Agricultural and Resource Economics and Sciences *Agricultural Commodity Statistics 2011*.

## Markets

In *Australian Commodities December 2010*, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) showed that 55 percent of the 38 million tonnes of grains produced in Australia in 2010 was exported (with a total value of \$6 billion).

Australian grain production also underpins Australia's domestic food processing sector, including the milling, malting, brewing and baking industries, while Australian feed grains underpin intensive animal production in the beef, lamb, pork, dairy and poultry industries. ABARES statistics show that, in 2010, the Australian flour milling industry consumed 2.8 million tonnes of wheat; the domestic consumption of malt barley was 850,000 tonnes; and more than 10 million tonnes of grain (wheat, barley and sorghum) was consumed in the intensive livestock industries.

## Business environment

The following key trends, opportunities and threats will shape the Australian grains industry and the investment environment for the GRDC during the life of this strategic plan.

### Global supply and demand

An overarching consideration for the development of the grains industry is the increasing global demand for food and feed grain. Demand is rapidly increasing because of population growth and changing consumption patterns, while supply is facing challenges due to climate change, the loss of productive land and reduced availability and quality of water.

Demand from China, India and the Middle East is likely to increase, in association with growing populations and an increase in the size and affluence of the middle classes. Wheat production in North America may plateau or even decline as land is diverted to producing alternative crops (primarily GM-enhanced corn and soybeans) or biofuels.

At the same time, however, the Australian grains industry will face increasing global competition—in terms of both quantity and quality of grain products—from countries in the Black Sea region (such as Ukraine) and, potentially, from South American countries.

### National supply and demand

Nationally, wheat will remain the major grain crop by tonnage, followed by barley in the Southern and Western regions and sorghum in the north. Although cereals will continue to dominate grain production, an increased emphasis on broadleaf crops (pulses and canola) and their genetic

improvement and incorporation into cropping systems will be needed to underpin the productivity of cereal crops.

A significant proportion of grain grown in South Australia and Western Australia will continue to be exported, while the northern, eastern and south-eastern grain areas will increasingly produce for domestic human consumption and animal feed markets. Second-generation biofuels may present opportunities for grain crops in specific, localised areas, based on feedstock availability and proximity to market.

### Rationalisation of the supply chain

Internationalisation of the grains industry supply chain will continue, and will influence both the sale and marketing of grain and the availability and pricing of essential inputs. Overseas ownership and investment in the supply chain has increased, and continuing consolidation across the supply chain has led to a reduction in the number of large grain accumulators and traders. Vertical and horizontal integration has also increased within the industry, as grain marketers have enlarged their ownership of milling, malting and rural services operations, thus increasing their capacity to influence the entire supply chain.

### Climate

Climate variability will continue to affect production, requiring innovation, resilience and risk management. Longer term climate change may increase pressure on production from marginal cropping areas, focusing attention on opportunities for diversification (including as part of the global carbon economy), and will increase the move to grain production in the higher rainfall areas.

Carbon pricing and emissions trading will create an incentive to use carbon-intensive inputs more efficiently, and to seek alternatives (such as pulses as a source of nitrogen). Robust emissions abatement methodologies will help the industry to contribute to the transition to a low carbon economy.

### Input costs

Australian growers' operating environment is one of constantly rising input costs being driven by increases in:

- the cost of oil which affects the prices of energy costs and nitrogen fertiliser
- weed resistance to key inexpensive chemical families, which require a shift to new, more expensive chemicals or fallow options.

In the short term, the high value of the Australian dollar will alleviate these effects.







## Exchange rate

Despite continued volatility in financial markets, the value of the Australian dollar is expected to remain relatively high, supported by strong demand for Australian coal, oil, gas and mineral commodities. While the value of the dollar remains high, to remain competitive in international markets Australian growers will have to accept lower prices for their grain. Because grain prices in Australia are largely dictated by export prices, this will affect income across the grains industry. This disadvantage may be partly offset by reductions in costs arising from a related drop in the price of imports. The high volatility in the exchange rate is an added difficulty for grain growers undertaking long-term planning for their farm or enterprise.

## GM technologies

Genetically modified (GM) technologies will be commercialised and accepted, offering potential to increase productivity and profitability. However, for cereals the timeframe is still uncertain and commercialisation is unlikely to occur within the next 10 years. Markets will increasingly demand traceability and quality assurance for grain and grain products incorporating GM technologies.

## Growers

The number of grain farms is likely to continue to decline slowly, and the average farm size is likely to increase. Corporate involvement in farming is likely to continue and increase.

A younger generation of growers who embrace new technologies and have an increasingly sophisticated and business-based approach to grain farming is emerging. Post-deregulation, growers are getting more involved in grain marketing and embracing the use of price risk management tools and on-farm storage.

Declining rural populations will put pressure on the survival of rural communities and the social infrastructure that supports grain growers at present. In addition, declining populations are generating labour shortages and tightening of the labour market is expected to continue.

## Farm advisers and consultants

Growers will continue to increasingly rely on advisers to provide agronomic, business, marketing, financial and price risk advice.

The GRDC Grower Survey conducted in November 2010 found that 62 percent of respondents had sought guidance from fee-for-service agronomists, farm advisors or consultants. This fee-for-service group was described as a major influence over grower decisions.

## Governments

Governments will continue to have major influences on the Australian grains industry through policies and regulations, including in relation to food safety and environmental responsibilities, as well as their commitment to investments in rural RD&E.

The Australian Government and state governments continue to be significant funders of RD&E related to the grains industry and to agriculture more generally. However, this role is under constant scrutiny, particularly among state governments, and a decline in state government support of rural RD&E seems likely.

Both state governments and the Australian Government have sought to increase rural RD&E's focus on:

- impact assessment and cost-benefit analysis of investments
- further collaboration across government R&D bodies
- the harmonisation of policies and funding across state and federal agencies.



## Partners

It is estimated that total expenditure on RD&E for the Australian grains industry exceeds \$385 million per year. This total RD&E investment supports approximately 1,400 full-time equivalent staff (mainly scientists and technicians) located at a large number of research hubs spread across the three grain-growing regions.

Table 1 provides a breakdown of grains RD&E investment for 2007-08, showing the relative contributions of the major investors. It is probable that the proportions of investment contributed by the GRDC and the private business sector have increased since 2007-08.

Table 1 Australian grains RD&E investment during 2007-08<sup>1</sup>

Organisation	\$ million	percent
State departments	123	32
CSIRO	45	12
Universities	39	10
GRDC	88 <sup>2</sup>	23
Private investment (estimate) <sup>3</sup>	90	23
<b>Total</b>	<b>385</b>	<b>100</b>

<sup>1</sup> Most recent data available to the Grains Industry National RD&E Strategy steering committee.

<sup>2</sup> GRDC investments outside Primary Industries Standing Committee agencies (other rural R&D corporations, grower groups/farming systems groups, cooperative research centres, international collaboration and private industry) totalled about \$30 million during 2007-08.

<sup>3</sup> Estimated \$45 million from private agrichemical, fertiliser and seed RD&E and \$45 million from private consultant extension service provision.

Source: Grains Industry National Research, Development and Extension Strategy, 2011.

## Grains Industry National RD&E Strategy

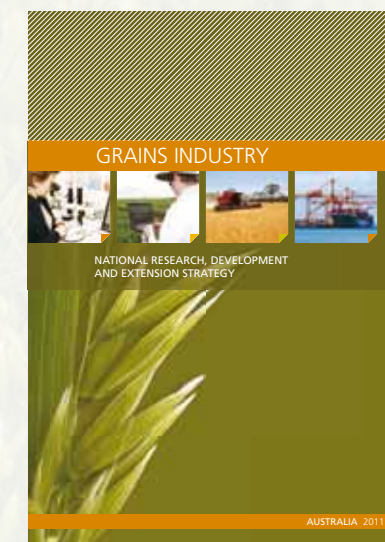
In April 2011, the *Grains Industry National Research, Development and Extension Strategy* (Grains Industry National RD&E Strategy) was finalised and endorsed by the Primary Industries Ministerial Council.

The Grains Industry National RD&E Strategy is one of more than 20 industry sector and cross-sectoral strategies devised as part of the National Primary Industries RD&E Framework. The development of the framework, which commenced in 2007, is intended to improve the efficiency and effectiveness of the national RD&E capability by strengthening collaboration and coordination between government agencies, research institutions and industry. The framework is based on a model of national research, regional development and local extension. More information on the national framework and sectoral strategies is available from the Department of Agriculture, Fisheries and Forestry website ([www.daff.gov.au](http://www.daff.gov.au)).

The process of developing the Grains Industry National RD&E Strategy commenced in 2009. The GRDC was a key member of the committee that designed the strategy, working with grain grower representatives, Australian Government and state government agencies, CSIRO and universities. The development of the strategy involved extensive consultation with participants across the grains industry value chain and RD&E

providers, as well as expert analysis of relevant industry reviews and jurisdictional plans.

The Grains Industry National RD&E Strategy sets out a detailed framework for achieving a highly efficient RD&E sector able to deliver 'a profitable, competitive and sustainable grains industry with spill-over benefits to the broader agricultural sector, the food processing industry and the Australian community'. More information on the Grains Industry National RD&E Strategy is available from the GRDC website ([www.grdc.com.au](http://www.grdc.com.au)).



Recognising that a relatively small pool of research dollars will go further if there is a clear strategy for reducing duplication and fragmentation, the grains industry has produced a framework for building RD&E capacity in particular research areas.





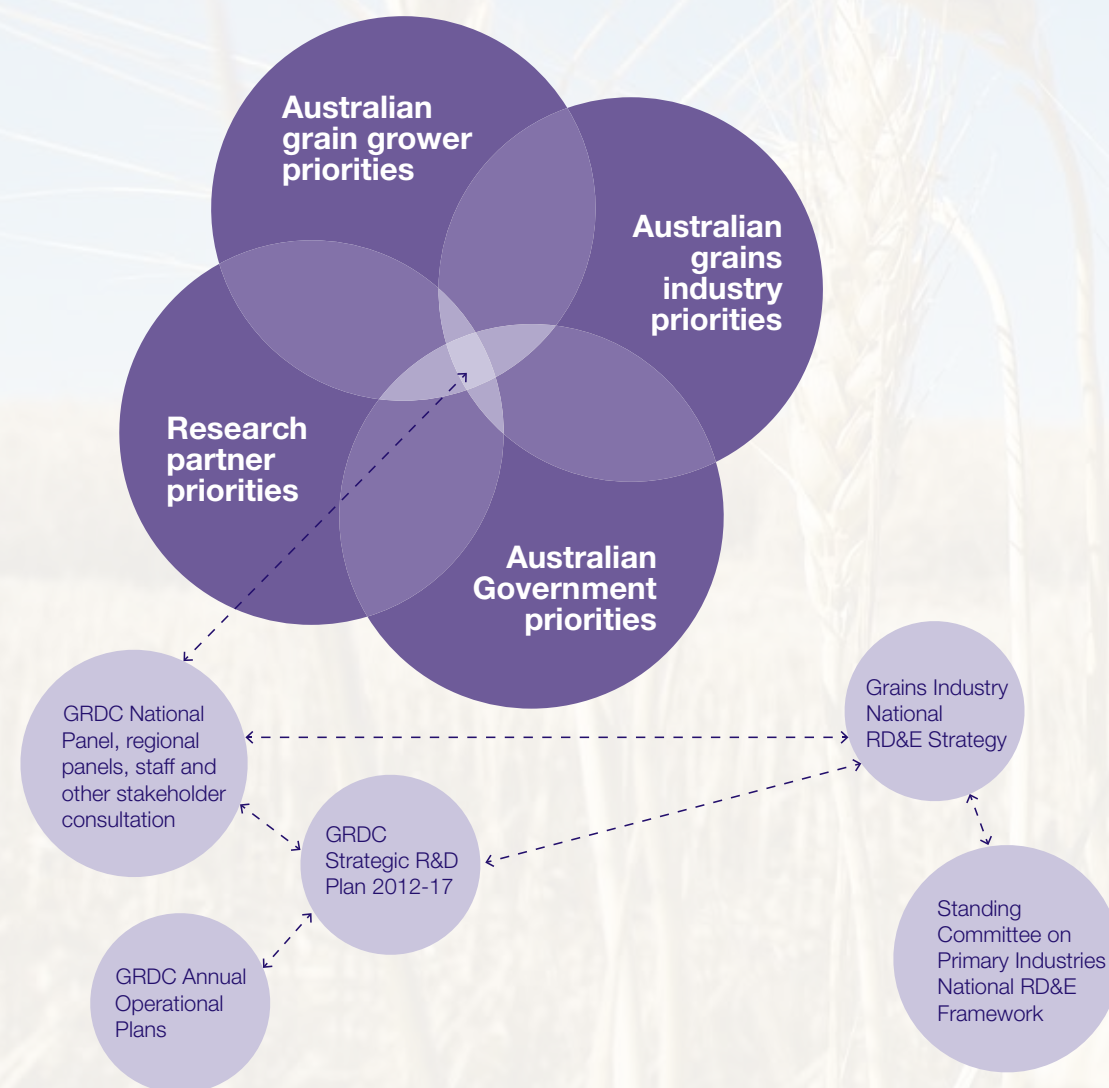
## GRDC five-year R&D strategy

This strategic plan provides a template to ensure that the GRDC will invest in RD&E in a sustainable manner, balancing long-term and short-term objectives, high-risk and low-risk investments, and strategic and applied research needs, over the five years from July 2012 to June 2017.

This plan embraces the principles, strategies and implementation plan set out in the Grains Industry National RD&E Strategy, and integrates them with the priorities established in the national cross-sectoral RD&E strategies and the identified priorities of Australian grain growers and the Australian Government. The five-year strategy is informed by consultation with grain growers, the wider grains industry, representatives of government and research partners, and other relevant stakeholders.

Figure 3 illustrates how this five-year strategic plan relates to the broader planning framework for Australian grains industry RD&E.

Figure 3 Planning framework for grains industry RD&E





# RD&E priorities

To ensure that its RD&E investments deliver the outcomes that the Australian grains industry needs over the life of this five-year strategic plan, the GRDC has identified the key RD&E priorities of Australian grain growers, the wider grains industry and the Australian Government, and considered them in the context of the Grains Industry National RD&E Strategy and other national priorities for rural RD&E and innovation, to develop the investment themes and outcomes of this strategic plan.

## Industry priorities

During the development of this strategic plan, the GRDC identified the RD&E priorities of Australian grain growers and the wider grains industry through:

- a range of consultation meetings with Grain Producers Australia, regional research advisory committees, agribusiness reference groups, grower groups, grower representative organisations and individual grain growers
- activities and GRDC discussions with organisations such as Wheat Quality Australia, Barley Australia, Pulse Australia and the Australian Oilseeds Federation, as well as traders and marketers in general.

Consultations were also undertaken with RD&E providers, individual researchers, scientists, and organisations that provide goods and services to the grains industry, to identify new opportunities in knowledge and innovation to address industry needs.

The GRDC has adopted the industry's overarching priorities as its themes for investment for 2012–17. Table 2 shows the key industry priorities for 2012–17.

Table 2 Grains industry priorities

RD&E priority	Objective
Meeting market requirements	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.
Improving crop yield	Genetic yield potential and stability improvement of: <ul style="list-style-type: none"> <li>- cereal varieties</li> <li>- pulse varieties</li> <li>- oilseed varieties.</li> </ul>
Protecting your crop	Effective, sustainable and efficient management of: <ul style="list-style-type: none"> <li>- weeds</li> <li>- vertebrate and invertebrate pests</li> <li>- cereal rusts</li> <li>- cereal (non-rust), pulse and oilseed fungal pathogens</li> <li>- nematodes</li> <li>- viruses and bacteria.</li> </ul> Biosecurity and pesticide stewardship.
Advancing profitable farming systems	Knowing what is important (key business drivers). Planning strategically (building system benefits and rotations). Responding tactically (individual crop agronomy).
Improving your farm resource base	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.
Building skills and capacity	Grains industry leadership and communication. Capacity building in the extension sector and the R&D sector. Capacity building for growers.





## Australian Government priorities

The Australian Government's key priorities for rural RD&E are identified in the:

- National Research Priorities announced in December 2002, and their associated priority goals
- Rural R&D Priorities announced to the RDCs by the Minister for Agriculture, Fisheries and Forestry in May 2007.

Table 3 shows how the Rural R&D Priorities and corresponding National Research Priorities are aligned to the GRDC's six strategic themes for RD&E investment in 2012–17. Financial resource allocations will be provided on a yearly basis in the annual operational plan.

Table 3 Alignment between GRDC investment themes and Australian Government priorities

Rural R&D Priorities	National Research Priorities	GRDC themes
Productivity and Adding Value Improve the productivity and profitability of existing industries and support the development of viable new industries.	Promoting and Maintaining Good Health	4 Advancing profitable farming systems 2 Improving crop yield 3 Protecting your crop
Supply Chain and Markets Better understand and respond to domestic and international market and consumer requirements and improve the flow of such information through the whole supply chain, including to consumers.		1 Meeting market requirements 6 Building skills and capacity
Natural Resource Management Support effective management of Australia's natural resources to ensure primary industries are both economically and environmentally sustainable.	An Environmentally Sustainable Australia	5 Improving your farm resource base 4 Advancing profitable farming systems
Climate Variability and Climate Change Build resilience to climate variability and adapt to and mitigate the effects of climate change.		
Biosecurity Protect Australia's community, primary industries and environment from biosecurity threats.	Safeguarding Australia	3 Protecting your crop

### Supporting the Rural R&D Priorities

Innovation Skills Improve the skills to undertake research and apply its findings.	Frontier Technologies for Building and Transforming Australian Industries	6 Building skills and capacity
Technology Promote the development of new and existing technologies.		2 Improving crop yield 3 Protecting your crop

## Other national priorities

In developing this strategic plan, the GRDC has considered the priorities endorsed by the grains industry, the RD&E sector and the Australian Government and state governments in the Grains Industry National RD&E Strategy.

The key goals of the strategy are to:

1. Build on existing national collaboration by developing improved processes for:

- Identifying and prioritising issues for RD&E investment
- Ensuring effective stakeholder engagement (growers, industry and RD&E partners)
- Agreeing common definitions and common impact evaluation assessments
- Reducing transactional costs in managing RD&E.

2. Devise more effective relationship models for engagement between public and private sector investment in RD&E to foster:
  - Investment by multinational bioscience companies in strategic research in Australia
  - The efficient delivery of extension through arrangements with consultants, agribusiness, and farming systems and grower groups
  - Value-adding opportunities for domestic and export grains.
3. Implement agency roles within the Primary Industries Ministerial Council (PIMC's) major-support-link National RD&E Framework to develop:
  - National research programs to create critical mass that will address national priorities and deliver national and regional outcomes
  - National centres of research capability to maintain critical infrastructure and critical science disciplines; and to establish links to access international research outputs
- Regional networks of applied RD&E, which support farming systems, improved practices, and adoption of national research outcomes.
4. Develop a national capability building plan to secure the intellectual and human capital and physical resources required to underpin future RD&E and industry innovation.
5. Develop a mechanism for regular review and alignment of government and industry objectives and agreement on priorities and portfolio balance under the National Grains RD&E Strategy.

In addition to implementing the Grains Industry National RD&E Strategy, the GRDC will collaborate with other RDCs and research organisations to support cross-sectoral research, guided by the strategies developed under the National Primary Industries RD&E Framework. The cross-sectoral strategies that align with GRDC's investment themes are shown in Table 4.

Table 4 Alignment between GRDC investment themes and cross-sectoral national RD&E strategies for primary industries

GRDC themes	Cross-sectoral strategies <sup>1</sup>
1 Meeting market requirements 5 Improving your farm resource base	Biofuels and Bioenergy Food and Nutrition
2 Improving crop yield 4 Advancing profitable farming systems 5 Improving your farm resource base	Climate Change Water Use in Agriculture Soils
3 Protecting your crop	Plant Biosecurity

<sup>1</sup> Described in the Primary Industries Ministerial Council publication *National Primary Industries Research, Development and Extension Framework Statement of Intent*, June 2011.

The strategic plan is also informed and influenced by the broader National Innovation Priorities, which were announced by the Australian Government in May 2009. The National Innovation Priorities are:

1. Public research funding supports high-quality research that addresses national challenges and opens up new opportunities.
2. Australia has a strong base of skilled researchers to support the national research effort in both the public and private sectors.
3. The innovation system fosters industries of the future, securing value from the commercialisation of Australian research and development.
4. More effective dissemination of new technologies, processes, and ideas increases innovation across the economy, with a particular focus on small and medium-sized enterprises.
5. The innovation system encourages a culture of collaboration within the research sector and between researchers and industry.
6. Australian researchers and businesses are involved in more international collaborations on research and development.
7. The public and community sectors work with others in the innovation system to improve policy development and service delivery.





# Investment themes and outcomes

The GRDC Strategic Plan 2012–17 will focus on delivering benefits to growers. The GRDC recognises that impacts on grower profit and sustainability can be achieved through better delivery of the current outputs of R&D.

The GRDC is also aware of the need to balance the RD&E portfolio to generate the new information and technologies required for future delivery of innovation to growers.

To achieve this balance, the GRDC has designed six themes to focus the RD&E investment portfolio on the activities that will make the biggest difference and deliver the best return to Australian grain growers, the wider grains industry and the wider community.

The strategic approach is underpinned by continual evaluation, measuring progress against key indicators of success in achieving the planned outcomes of each investment theme.

Figure 4 shows the themes, as they relate to the GRDC's overarching vision.

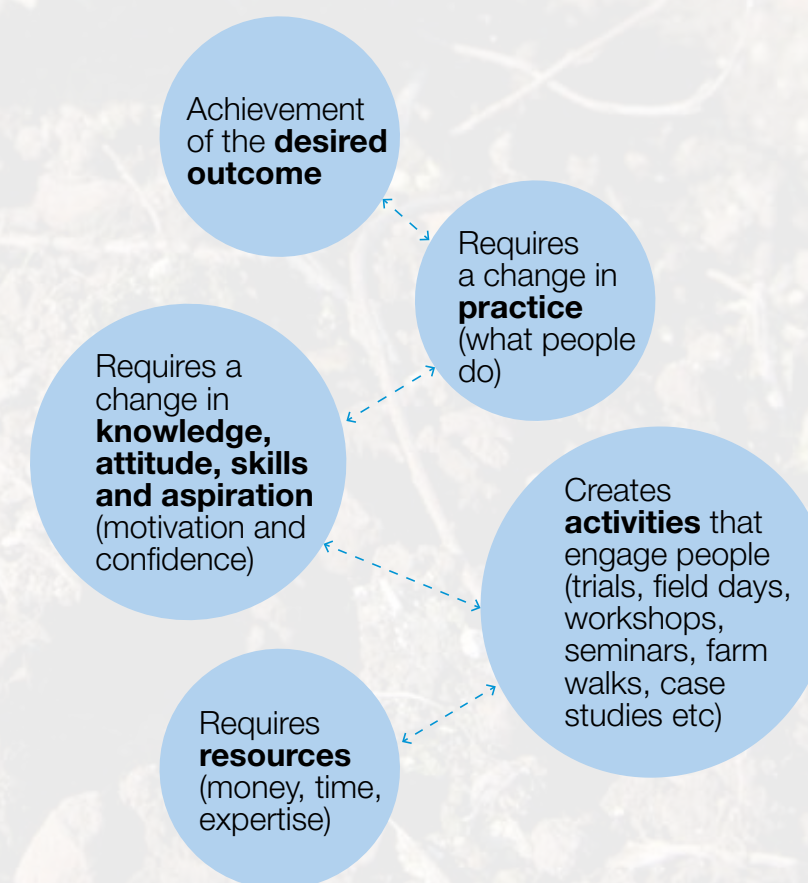
Figure 4 GRDC investment themes and GRDC vision.



## Investment themes

The GRDC's RD&E investment themes are based on a 'program logic' approach (as shown in Figure 5), which utilises concepts for hierarchical planning that were developed by Claude Bennett in the 1970s and are still widely used.

Figure 5 Program logic of GRDC investment themes



Source: Cam Nicholson, Nicon Rural Services, August 2011.

The aspirational outcome of each theme describes the long-term goal, to be achieved over 10 or more years. The aspirational outcomes extend beyond the duration of this plan but are important factors to be considered in developing the strategic direction for the next five years.

Each theme also has several intermediate outcomes to be achieved during the course of the plan, which together will progress the industry toward the longer term outcomes.

Underpinning each intermediate outcome are the practice changes that describe what needs to happen in order for that intermediate outcome to be achieved. Within each theme, the GRDC will direct its RD&E investments to activities that most efficiently enable and foster the practice changes required.

The practice changes listed for each investment theme have an on-farm focus, consistent with the GRDC's commitment to deliver value to growers. However, for many of the outcomes, achieving the necessary practice change at the farm level will also require practice change in other parts of the grains industry.

Where possible, the performance measures to track the progress of key practice changes have been quantified, as shown by the 'key metrics' in figures 6 to 11. For a number of practice changes and outcomes, the development of suitable metrics will require the identification and development of new sources of data about the baseline condition. This is a high priority for the GRDC. As it is achieved further key metrics will be developed. Key performance indicators for each practice change (targets) will be set out each year in the GRDC's annual operational plan.





## 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 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 will interact 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.

Figure 6 details the aspirational and intermediate outcomes for this theme, as well as the performance measures.

Figure 6 Planned outcomes for Theme 1—Meeting market requirements

### Aspirational outcome (10+ years)

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

### Intermediate outcomes (5 years)

#### Outcome

#### Practice changes and key metrics







## 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.

Figure 7 details the aspirational and intermediate outcomes for this theme, as well as the performance measures.

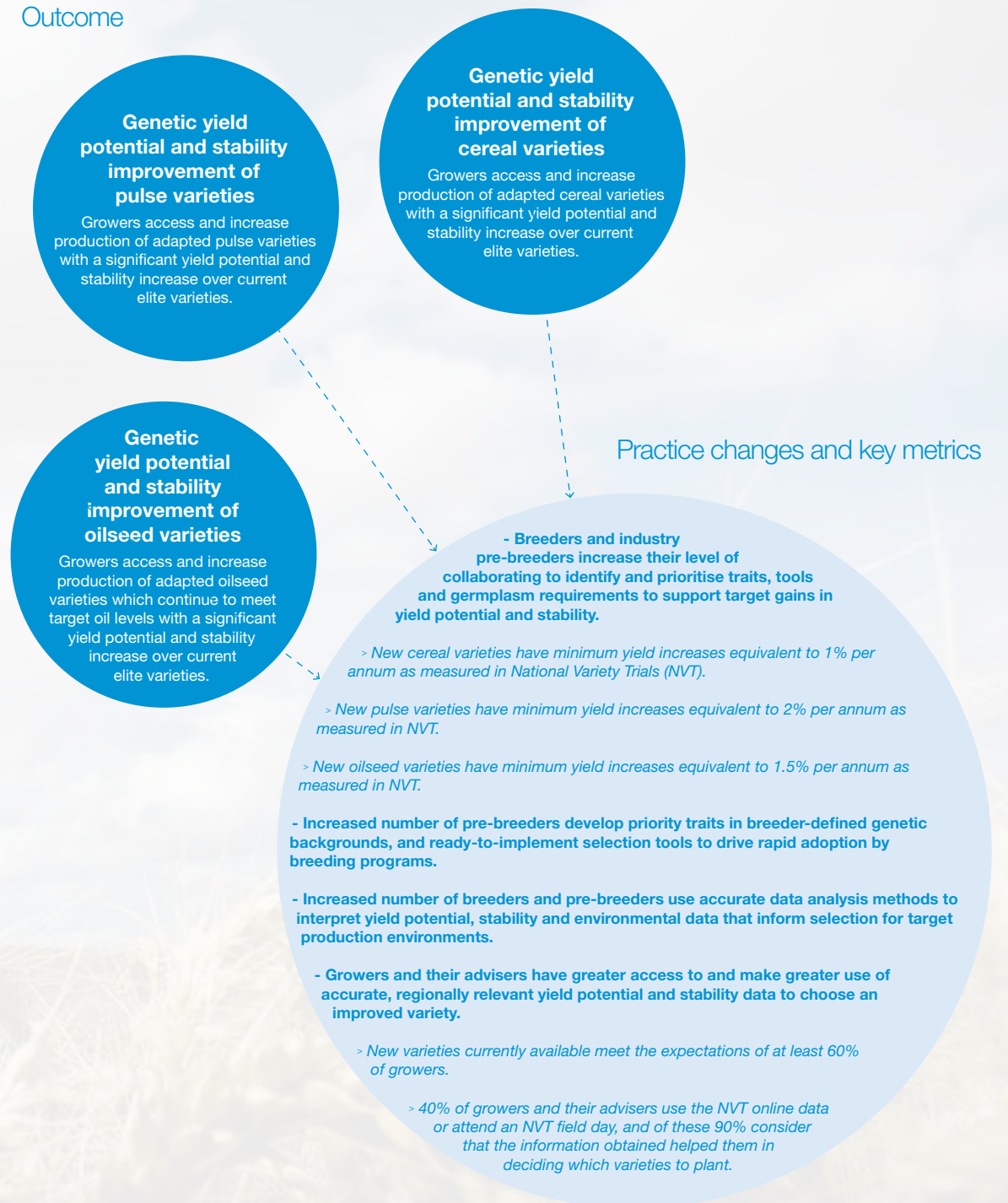
Figure 7 Planned outcomes for Theme 2—Improving crop yield

### Aspirational outcome (10+ years)

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.

### Intermediate outcomes (5 years)

#### Outcome







## 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 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.

Figure 8 details the aspirational and intermediate outcomes for this theme, as well as the performance measures.

Figure 8 Planned outcomes for Theme 3—Protecting your crop

### Aspirational outcome (10+ years)

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

Figure 8 Planned outcomes for Theme 3—Protecting your crop (continued)

### Intermediate outcomes (5 years)





## 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 will:

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

The investment strategies for this theme will differ across agroecological zones and farming systems, and will be 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.

Figure 9 details the aspirational and intermediate outcomes for this theme, as well as the performance measures.



Figure 9 Planned outcomes for Theme 4—Advancing profitable farming systems

### Aspirational outcome (10+ years)

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.

### Intermediate outcomes (5 years)





## 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.

Figure 10 details the aspirational and intermediate outcomes for this theme, as well as the performance measures.

Figure 10 Planned outcomes for Theme 5—Improving your farm resource base

### Aspirational outcome (10+ years)

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

### Intermediate outcomes (5 years)

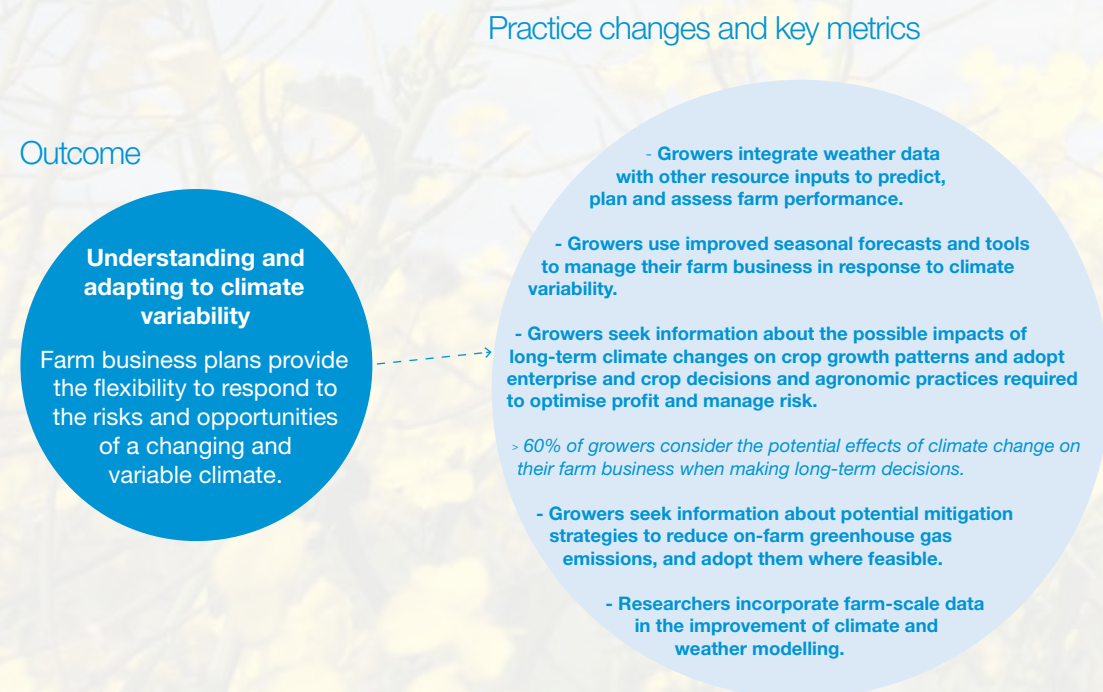


Figure 10 Planned outcomes for Theme 5—Improving your farm resource base (continued)







## 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.

Figure 11 details the aspirational and intermediate outcomes for this theme, as well as the performance measures.

Figure 11 Planned outcomes for Theme 6—Building skills and capacity

### Aspirational outcome (10+ years)

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

### Intermediate outcomes (5 years)







## Evaluating progress

Throughout the life of this Strategic R&D Plan, the GRDC will measure, evaluate and report on the progress being made in achieving the aspirational and intermediate outcomes of each of the six investment themes. The frequency of evaluation will match the rate of practice change. Results will be used to alter the investment mix where required, and to make improvements in the management of RD&E investments in order to achieve the outcomes as effectively and efficiently as possible.

The GRDC has developed a 'monitoring, evaluation, reporting and improvement (MERI)' plan for each theme. Each plan includes a set of key evaluation questions that, when tested, will enable the Board and GRDC stakeholders to assess the progress made in relation to the theme. For each question, the plan identifies performance indicators and sources of data that will underpin the evaluation.

Table 5 provides examples.

Table 5 Examples of questions, indicators and data sources used in monitoring, evaluation, reporting and improvement plans

Theme and intermediate outcome	Key evaluation question	Indicators	Sources of data
3 Protecting your crop Cost-effective management of weeds	Are new, cost-effective control methods for weeds, including new chemistries and non-chemical control tactics, being delivered to the industry?	<ul style="list-style-type: none"><li>- Number, type and cost-effectiveness of new control methods approved and available.</li><li>- Level of adoption of new methods.</li><li>- Changes in effectiveness of weed management and in savings and profit achieved.</li></ul>	<p>Australian Pesticides and Veterinary Medicines Authority approvals of new control products.</p> <p>Changes in types, amounts and costs of active ingredients, dollar cost, being used by the industry, based on market survey data.</p> <p>Grower/adviser survey data on use and effectiveness of control methods, adoption of integrated weed management techniques, and returns on investment in new methods.</p> <p>Changes in cost of weed control.</p>
5 Improving your farm resource base Understanding and adapting to climate variability	Are growers and advisers using seasonal forecasts, local climate data and decision tools to predict and plan likely crop and farm performance and in their tactical (seasonal) decisions?	<ul style="list-style-type: none"><li>- Awareness of potential impacts of climate variability.</li><li>- Use of seasonal forecasts and decision tools to manage effects of climate variability.</li></ul>	<p>Grower/adviser/group surveys of awareness and use of weather forecasts and tools.</p> <p>Data from website hits and downloads (for example from the Climate Kelpie and Yield Prophet websites).</p> <p>Availability of collated climate data (rainfall, degree days, frost risk) from local stations on the Bureau of Meteorology website.</p> <p>Survey data on use by growers/advisers of contingency plans and tactics; risk management tools (insurance, forward selling, off-farm income, risk profiling); and risk assessments by banks and other rural lenders.</p> <p>Use of opportunity strategies shown by survey and by change in regional mix of crop types recorded at receival points.</p>

The ongoing evaluation of progress in achieving the outcomes of this strategic plan will be informed and complemented by the regular process of reviewing performance against specific yearly targets, as defined in the annual operational plan and reported against in the annual report, growers' report and other GRDC publications.





# Corporate strategies

The GRDC has developed five key corporate strategies to drive the corporation's performance in managing its RD&E investments:

- **Create value**—Deliver value by investing in programs that address the key industry priorities with the greatest potential returns.
- **Coordinate nationally**—Ensure that programs are nationally coordinated and the Australian grains industry has access to the RD&E infrastructure and capability that it needs for the future.
- **Deliver regionally**—Deliver the outputs of research in innovative products and services relevant to growers and their advisers in each region.
- **Connect globally**—Proactively source new technologies and innovation from around the world for the Australian grains industry.
- **Engage with growers and industry**—Actively listen to and engage with growers and the broader grains industry.

To effectively implement the corporate strategies, the GRDC will work on making its investment processes simpler, more responsive and more transparent to its stakeholders.

Fully implementing the five corporate strategies will ensure that the Australian grains industry is supported by an efficient and effective RD&E community, with excellent international linkages, that is focused on returning value to growers and the wider Australian community.

## Create value

The Australian grains industry is diverse, geographically dispersed and presented with many opportunities and challenges. RD&E in the grains industry is complex and often requires investment over extended periods before outcomes to industry are realised.

It is critical to the future of the grains industry that the national RD&E effort is focused on the priorities that are most likely to give the greatest return on investment to growers, through innovation and global competitiveness. Paying the GRDC levy needs to be the best investment that a grower makes in improving their business. It is, therefore, important that priority research targets are established with industry involvement. Emphasis on regular consultation ensures that local and regional needs are met.

The establishment of themes and investment strategies that cover the breadth of the GRDC's portfolio and focus RD&E investments on the opportunities and constraints that will make the biggest difference and deliver the greatest returns is essential in creating value.

## Coordinate nationally

The GRDC will develop and implement investment strategies consistent with the Grains Industry National RD&E Strategy, which identifies the key capacities and capabilities of R&D agencies and organisations in line with the concept of nationally coordinated research supported by regional development and local extension.

To achieve a highly efficient national grains RD&E sector, the GRDC will work with its partners to:

- build on existing national collaborations
- develop effective relationship models for private–public collaboration
- develop and implement the national RD&E framework for the grains industry
- build national capability for grains RD&E
- align RD&E investment with stakeholder priorities.

## Deliver regionally

Growers need access to the best possible information and research findings to maximise the performance of their businesses. Growers use numerous channels to obtain information, increasingly involving input from agribusiness and private consultants. The GRDC recognises the need to work closely with the private extension sector.

The GRDC has been investing in grains-related RD&E for more than 20 years. During this period the GRDC, with its partners, has generated a considerable quantity of information from research outputs and findings, much of which remains relevant today. Significant improvements in production and profit can be realised if this current information is packaged in easy-to-use products and services that are tailored to growers in local regions.

Typically, research results have been communicated to industry through GRDC Grower Updates, GRDC Adviser Updates, *Ground Cover*, fact sheets, media releases, communication campaigns and the GRDC website. While these remain important communication channels, new information technologies such as mobile phone applications provide an opportunity to communicate the results of GRDC-funded research more effectively.

Networking is a vital element of this strategy. The GRDC's Regional Cropping Solutions networks will listen to the local needs of growers and their advisers, and deliver customised products and services. These networks are the foundation for issue identification, priority setting and adoption of outcomes from RD&E.

## Connect globally

Strengthening international research linkages and developing robust partnerships with both the public and private sectors overseas will be essential to achieving the GRDC's objectives for 2012–17.

Research conducted overseas can provide spillover productivity gains for Australia, through sharing ideas or adapting technology to suit local conditions. Several studies have found that foreign R&D is as important for productivity growth as is domestic R&D, and that foreign research is particularly important to small, open economies such as Australia's. Although the Australian grains RD&E community is highly regarded internationally, in the global context Australia's R&D effort is small, representing only about 2 percent of the worldwide effort.

Internationally, the private sector is dominant in RD&E for maize, soybean and canola and becoming increasingly important in RD&E for wheat, barley and sorghum. The private sector is

also playing a substantial role in the development of new technologies, including new varieties (both GM and conventional), new pesticide chemistries and advanced engineering.

In the public sector, through organisations such as the International Maize and Wheat Improvement Center (CIMMYT) and the International Center for Agricultural Research in the Dry Areas (ICARDA), international syndicates are forming to solve difficult but important challenges such as lifting yield potential to assist sustainable production in developing countries and increasing water-use efficiency.

A key element in this new strategic direction for the GRDC is the engagement of the international RD&E sector to identify potential opportunities for the GRDC to invest to deliver technology for the benefit of the Australian industry and community. This will also require the identification of Australian partners to test and adapt international technology and deliver it to Australian growers.

The Australian research community has an integral role in connecting globally, through peer review of papers, conferences, research collaborations and the tradition of doctoral students undertaking post-doctoral roles outside their home country. High-quality Australian agricultural research underpins international linkages.

## Engage with growers and industry

The three regional advisory panels have long been recognised as a major strength of the GRDC. The panels, made up of growers, advisers and researchers, consult with industry and advise the GRDC on RD&E needs and priorities.

It is critical that the GRDC further strengthens the links between its regional panels, researchers and industry to increase the opportunity for growers to influence the RD&E agenda. Strengthening these links will ensure that the GRDC has two-way communication with stakeholders about its investments and activities, and will help the GRDC to target the delivery of its products and services.

The GRDC will work to ensure that the regional panels function effectively and complement the more localised activities of the Regional Cropping Solutions networks. This will provide opportunities for growers and advisers to have greater input into issue identification and to be actively involved in the delivery of R&D outcomes.

The GRDC regional panels and Regional Cropping Solutions networks are also well placed to bring researchers together directly with consultants, advisers and growers, to spark innovative ideas by discussing scientific opportunities in conjunction with the practicalities of growing grain profitably and sustainably.





# Organisation

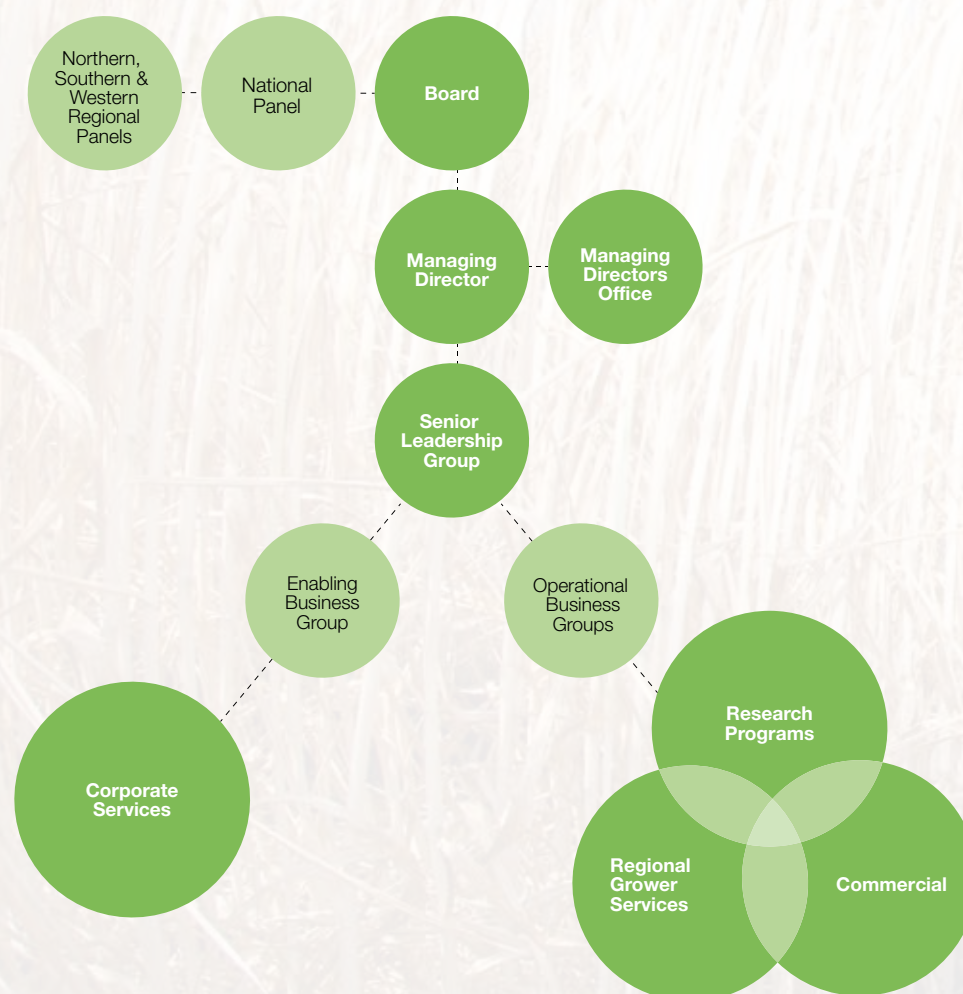
The GRDC's operations are tailored to most effectively apply the organisation's resources to achieve its outcomes.

Through the GRDC structure, the strengths of the GRDC's highly committed staff are enhanced by the depth of experience of its directors and the diverse knowledge and skills of its advisory panel members. All aspects of the GRDC's performance and accountability are underpinned by robust corporate governance policies and practices.

## Structure

Figure 12 sets out the organisational structure of the GRDC.

Figure 12 Organisational structure







Board

The GRDC Board, headed by the Chair, oversees corporate governance, sets strategic direction and monitors the ongoing performance of the corporation and the Managing Director.

The Board has combined expertise in business management strategy; corporate governance; commodity production, processing and marketing; finance; risk management; management and conservation of natural resources and the environment; R&D administration; science, technology and technology transfer; intellectual property management; and public administration.

Board members are appointed by the Minister for Agriculture, Fisheries and Forestry on the recommendations of an independent selection committee.

Panels

The GRDC’s advisory panels help to ensure that GRDC investments are directed towards the interests of all its stakeholders and deliver benefits as relevant products and services in each grain-growing region. The efforts and expertise of this network of growers, advisers and researchers are crucial to the GRDC’s success.

The National Panel:

- addresses national RD&E priorities across the GRDC’s investment portfolio and makes recommendations to the Board
- assists the Board to maintain links with grain growers, the Australian Government, state and territory governments and research partners.

The National Panel is composed of the chairs of the three regional panels, the Managing Director and the GRDC’s executive managers.

The Northern Regional Panel, Southern Regional Panel and Western Regional Panel represent Australia’s three grain-growing regions. Each regional panel:

- identifies and monitors regional and national grains industry issues that are relevant to the region
- interacts with grower groups, research advisory committees and other interested parties in the region to exchange information
- identifies and develops priorities for RD&E investment and recommends these to the National Panel

- keeps growers and advisers in the region informed about the GRDC’s strategic direction, investment portfolio and research projects
- assists staff in monitoring the effectiveness of the investment portfolio.

The regional panels are composed of grain growers, agribusiness representatives, researchers and the GRDC’s executive managers.

Senior Leadership Group

The Senior Leadership Group is responsible for advising the Board, realising the Board’s priorities, and managing and evaluating the GRDC’s investments in RD&E.

The Senior Leadership Group is composed of the Managing Director and the executive manager of each of the GRDC’s four business groups.

Business groups

The GRDC’s business activities are conducted by three operational business groups and an enabling business group.

Table 6 provides details of each group.



Table 6 GRDC business groups

Mandate	Priorities
Operational business groups	
Research Programs	
Create value for Australian grain growers by investing in R&D programs that address key grains industry priorities, enhance competitiveness and sustainability and generate the greatest potential return for growers and the wider community. Ensure that R&D programs are nationally coordinated and integrated with extension so that the Australian grains industry has access to a highly capable and effective RD&E sector with the infrastructure and capability to meet future industry needs.	<ul style="list-style-type: none"><li>- Design R&amp;D programs focused on addressing issues identified by stakeholders.</li><li>- Deliver R&amp;D outcomes that are adoptable and therefore have an impact at the farm level.</li><li>- Provide scientific advice to stakeholders to assist in the identification of issues.</li><li>- Provide national coordination and regional linkages that ensure that R&amp;D is focused and adoptable.</li><li>- Ensure that R&amp;D capability is maintained in core areas.</li></ul>
Commercial	
Access and develop innovation from Australia and overseas to ensure that it is commercialised in such a way that the overall benefit to Australian grain growers is optimised.	<ul style="list-style-type: none"><li>- Expand the GRDC’s global reach in order to increase the availability of technology to the Australian grains industry.</li><li>- Invest in R&amp;D and commercialisation in commercial grain technologies and commercial farm technologies that meet industry priorities and provide the greatest benefit to the GRDC’s stakeholders.</li><li>- Take the lead in identification, scoping, undertaking market assessment and assessing the value of GRDC commercially orientated investments.</li><li>- Ensure that the GRDC’s investment in intellectual property and commercial enterprises continues to be focused on providing a return on investment.</li><li>- Identify the opportunities provided within the GRDC R&amp;D portfolio to form more commercial partnerships to deliver benefits to the Australian grains industry.</li></ul>
Regional Grower Services	
Deliver the outputs of research in innovative products and services that meet the needs of growers and their advisers in each region.	<ul style="list-style-type: none"><li>- Understand growers’ needs (listen to what is important).</li><li>- Develop new and improved grower-orientated products and services.</li><li>- Deliver high-value regionally relevant products and services to growers and advisers.</li><li>- Evaluate the performance and impact of GRDC products and services on growers’ performance.</li></ul>
Enabling business group	
Corporate Services	
<p>In the context of the GRDC delivering benefits to its stakeholders, provide:</p> <ul style="list-style-type: none"><li>- the supporting services required for the GRDC to plan, conduct, report on and assess the effectiveness of its operations</li><li>- processes to assist the operational business groups to achieve their objectives</li><li>- support for effective governance of the GRDC by the Board.</li></ul>	<ul style="list-style-type: none"><li>- Plan to satisfy corporation objectives.</li><li>- Establish business processes to optimally support all business groups in the GRDC.</li><li>- Provide services to the operational business groups (human resources, information technology, records management and evaluation).</li><li>- Report for risk and compliance purposes.</li><li>- Perform financial forecasting, reporting and budgeting.</li><li>- Provide legal advice to the corporation.</li><li>- Conduct performance evaluation, including impact assessment.</li><li>- Perform portfolio and business analysis.</li></ul>





# Corporate governance

The *Primary Industries and Energy Research and Development Act 1989* (PIERD Act) sets out the legislative framework and rules for the establishment and operation of the GRDC.

As well as its responsibilities under the PIERD Act, the corporation has accountability and reporting obligations set out in the *Commonwealth Authorities and Companies Act 1997*, the Commonwealth Authorities (Annual Reporting) Orders 2011 and annual Commonwealth Authorities Companies Orders (Financial Statements).

Corporate governance within the GRDC is guided by the Australian National Audit Office's *Better Practice Guide: Public Sector Governance*.

Table 7 sets out the key elements of the GRDC's corporate governance framework and Table 8 identifies required accountability outcomes and mechanisms for evaluation.

Table 7 Elements of the GRDC corporate governance framework

Element	Description
Accountability	<p>Through its Board, the GRDC is accountable to the Australian Parliament through the Minister for Agriculture, Fisheries and Forestry. The GRDC formally reports to grain growers through their representative organisation, Grain Producers Australia.</p> <p>The GRDC also communicates with stakeholders through a range of channels, including:</p> <ul style="list-style-type: none"><li>- regular meetings with and reports to the Department of Agriculture, Fisheries and Forestry</li><li>- publications and online content</li><li>- consultation with grower groups, agribusiness and R&amp;D partners</li><li>- a grower survey, conducted every two years</li><li>- conferences, workshops, grower updates and similar activities.</li></ul>
Audit processes	<p>Independent internal and external audits are applied to the GRDC's financial, risk, fraud, quality and RD&amp;E management.</p>
Environmental management	<p>The GRDC reports annually on its performance in relation to ecologically sustainable development and other matters outlined in the <i>Environment Protection and Biodiversity Conservation Act 1999</i>.</p>
Financial control	<p>The GRDC maintains accounts and records of transactions and affairs in accordance with accepted accounting principles generally applied in commercial practice, and with legislative requirements.</p>
Fraud and risk management	<p>As part of the quality management system, the GRDC's fraud and risk management framework includes processes for project, program and portfolio-level risk management, general compliance and operational risk management, financial risk management, and prudential guidelines for business ventures.</p>
Freedom of information and privacy	<p>The GRDC complies with the <i>Freedom of Information Act 1982</i> and the <i>Privacy Act 1988</i>.</p>
Monitoring performance	<p>The GRDC monitors and measures performance to continually improve its effectiveness and efficiency. The Board, management and all staff are set performance objectives each year. Performance against these objectives is reviewed regularly.</p>
Planning and reporting	<p>The elements of the GRDC's corporate planning and reporting approach include:</p> <ul style="list-style-type: none"><li>- strategic R&amp;D plan—sets out the GRDC's high-level goals, strategies and performance measures for a five-year period, developed in consultation with stakeholders and approved by the Minister</li><li>- investment plan—informs potential research partners about some of the GRDC's new investment priorities for the next financial year and invites interested parties to submit research proposals</li><li>- annual procurement plan—makes procurement information publicly available through the Australian Government's AusTender procurement management website</li><li>- annual operational plan—specifies the annual budget, resources and research priorities that give effect to the strategic R&amp;D plan during a given financial year</li><li>- portfolio budget statements—as part of the Australian Government budget process, summarises the planned outputs, outcomes, performance information and financial statements for a given financial year</li><li>- annual report—provides information on GRDC activities and their performance in relation to the goals set in the annual operational plan and portfolio budget statements for a given financial year</li><li>- growers' report—provides performance information to growers on R&amp;D activities for a given financial year</li><li>- stakeholder report—meets legislative requirements for reporting to the grains industry's representative organisation, Grain Producers Australia.</li></ul>

Element	Description
Policies and procedures	<p>The GRDC Operating Manual, which is available to the Board and all staff members, describes the corporation's:</p> <ul style="list-style-type: none"><li>- policies and procedures</li><li>- roles and responsibilities (including those of the Board and Board committees)</li><li>- Code of Business Conduct and Ethical Behaviour</li><li>- approval authority schedule, which includes delegations</li><li>- general guidelines.</li></ul>
Quality management system	<p>The GRDC's Quality Management System has ISO 9001:2008 quality assurance accreditation. The GRDC applies systematic processes designed to demonstrate clear leadership on quality and to promote quality assurance to stakeholders and others with whom the GRDC is involved.</p>

Table 8 GRDC accountability outcomes and evaluation measures

Outcome	Measures
Governance arrangements are supporting: <ul style="list-style-type: none"><li>- sound decision-making</li><li>- strong accountability</li><li>- total compliance with the <i>Primary Industries and Energy Research and Development Act 1989</i>, the <i>Commonwealth Authorities and Companies Act 1997</i> and other relevant legislation and regulation</li><li>- open and constructive interaction with the GRDC's representative organisation.</li></ul>	<p>Accurate and timely external reporting.</p> <p>Financial control.</p> <p>Compliance with legislation and regulations.</p> <p>Timely and responsive reporting to the representative organisation to provide it with the information and support it needs to carry out its governance role.</p>
Stakeholders understand the GRDC's strategy and what is to be achieved	<p>Research agencies' co-investment proposals recognise the GRDC's strategic direction.</p> <p>Grains industry participants see a consistent approach to GRDC activities.</p> <p>The GRDC collaborates on and participates in cross-sectoral strategies where they intersect with GRDC strategy.</p> <p>The Australian Government sees benefits being delivered for the broader community.</p>
Individual and team performance effort as well as organisational culture is aligned with the GRDC's strategic direction.	<p>Roles are clear and responsibilities are linked through to GRDC's objectives.</p>
The GRDC's information systems enable continuous knowledge creation for the benefit of the GRDC's stakeholders.	<p>Data capture and use continually create new knowledge supporting product and service development.</p>







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