GRDC

The Grains Research and Development Corporation is a national organisation with a mandate to plan and invest in R&D for the Australian grains industry. Its primary business activity is the allocation and management of investment in R&D.

GRDC VISION
Driving innovation for a profitable and environmentally sustainable Australian grains industry.

GRDC MISSION
To invest in innovation for the greatest benefit of its stakeholders. This will be achieved by being a global leader in linking science, technology and its adoption, with industry and community needs.

GRDC VALUES
- Commitment and action in meeting our stakeholder/customer needs and exceeding their expectations
- Winning as a team
- Achievement of superior results
- Creativity and innovation
- Openness and trust in dealing with people
- Performance-driven culture
- Ethical behaviour in all our activities
16 April 2005

Senator the Hon. Richard Colbeck
Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
Parliament House
CANBERRA ACT 2600

cc  The Hon. Warren Truss, MP
     Minister for Agriculture, Fisheries and Forestry

Dear Senator

I am pleased to submit for your approval the annual operational plan of the Grains Research and Development Corporation (GRDC) for the financial year 2005–06. This is required under sections 25 and 26 of the Primary Industries and Energy Research and Development Act 1989.

In developing the plan, the GRDC has been conscious of the need to facilitate performance reporting, as required under the Commonwealth Authorities and Companies Act 1997. This is consistent with the GRDC's responsibility to plan and report in an 'outcomes and outputs' framework.

The coming financial year will be the fourth under the corporation's third Five Year Research and Development Plan, Driving Innovation.

Research activities supported in 2005–06 (outlined in this annual operational plan) will contribute to achieving the future directions and objectives set out in Driving Innovation for the period 2002 to 2007. Table 1 indicates how the GRDC's R&D portfolio addresses the Australian Government's National Research Priorities and Rural R&D Priorities.

Section 6 of this annual operational plan explains that estimates of expenditure are indicative. Changes in the operating environment may require the GRDC to vary the total expenditure or specific allocations to secure its objectives. Variations may be required as a result of additional investments not presented here, or as a result of budget revisions arising from changes in levy income.

Yours sincerely

TERRY J ENRIGHT
Chairman

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This year’s plan
The Annual Operational Plan 2005–06 is the fourth such plan devised against the GRDC’s Five Year Research and Development Plan for 2002 to 2007, Driving Innovation. This year, the annual operational plan also reflects a strategic business plan, The Way Forward, devised by the GRDC to translate our broad corporate aims into practical objectives and strategies that are embraced at all levels of the organisation.

After summarising the organisation and its objectives, this operational plan describes how, through a targeted investment portfolio, four output groups and a clearly defined business structure, the GRDC will meet and hopefully exceed the expectations of our stakeholders in addressing Australia’s R&D priorities for the grain industry in 2005–06.

Strategic business plan
In February 2004, the GRDC National Panel decided to prepare a strategic business plan to complement Driving Innovation. The decision was driven by:

- the need to clarify and update the corporation’s strategic direction
- the appointment of a new Managing Director
- the need to improve ownership and understanding of the GRDC’s strategic direction by the whole organisation.

The preparation of the business plan involved input from all levels of the company, including from members of the National Panel, staff and regional panels. Extensive consultation was used not only to canvas ideas but also to foster ownership of the strategic planning process and the resulting plan.

The new strategic business plan, The Way Forward, includes the results of a situational analysis and articulates the organisation’s response to what impacts on the GRDC’s immediate business environment (for example, R&D partnerships) on a day-to-day basis, and what impacts on our broad business environment (for example, grain markets) over time.

The corporation recognises that sound execution is critical to the success of the strategy. This will depend on how it is owned and implemented to meet the needs of stakeholders and exceed their expectations.
Outcomes and structure

The overall outcome targeted by the GRDC remains unchanged: Through its commitment to innovation, an Australian grains industry that is profitable and environmentally sustainable for the benefit of the industry and wider community.

The required outcome of the new business plan is an Australian grains industry in which R&D enables our graingrowers to more effectively:

- compete in the ever-changing global grains industry
- support the Australian Grains Industry Strategic Plan 2005–25, and its impact on the GRDC’s strategic direction
- deliver results in relation to the Australian Government’s National Research Priorities and stated priorities for rural R&D corporations.

The outcomes reflect the corporate vision in Driving Innovation, and are consistent with the Agriculture, Fisheries and Forestry portfolio goal of achieving more sustainable, competitive and profitable Australian agricultural, fisheries, food and forestry industries.

This annual operational plan details how four output groups will contribute to achieving these outcomes in 2005–06. Those output groups are:

1. Varieties
2. Practices
3. New Products

The plan also describes the business structure—including identified pathways to market, lines of business and enabling functions—through which these output groups will meet their objectives. Pages 6 to 8 outline the strategic business plan in terms of:

- key findings
- corporate strategies
- core business processes and enabling functions.

Priorities and performance

The GRDC has identified key priorities for 2005–06, to help to achieve the strategies set out in Driving Innovation and The Way Forward, which include the following:

- the introduction of the National Variety Trials Program
- developing a coordinated national approach to barley breeding
- delivering results on pulses.

All of these deliver on the core strategy of ‘coordinating a national grains R&D agenda/portfolio’, including the reduction of duplication and fragmentation. This plan provides details of the investment priorities for the year, and describes how they relate to the prevailing business environment and the R&D priorities of our key stakeholders.

Performance measurement, at both the corporate and program levels, continues to be a key component of the annual operational plan. Performance indicators for each output group have been identified. Systematic evaluation of these output groups by external consultants has been contracted, to produce assessments of the performance of the output groups and the GRDC overall, to be discussed in the relevant annual report.

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1 The National Research Priorities are: an environmentally sustainable Australia; promoting and maintaining good health; frontier technologies for building and transforming Australian industries; and safeguarding Australia. The Rural R&D Priorities, announced in March 2003, are: sustainable natural resource management; improving competitiveness through a whole-of-industry approach; maintaining and improving confidence in the integrity of Australian agricultural, food, fish and forestry products; improved trade and market access; use of frontier technologies; protecting Australia from invasive diseases and pests; and creating an innovative culture.
The Grains Research and Development Corporation (GRDC) was established in 1990 as a statutory corporation under the Primary Industries and Energy Research and Development Act 1989.

The GRDC’s role is to invest in research, development and related activities to benefit Australian grain growers, the wider grains industry and the Australian community. In doing so, the GRDC invests in research where obstacles to industry’s progress exist and where R&D may be effective in overcoming these obstacles. This includes:

- investigating and evaluating the requirements for R&D in the grains industry
- coordinating or funding the execution of R&D activities
- facilitating the dissemination, adoption and commercialisation of the results of R&D.

The GRDC research portfolio covers a total of 25 leviable crops. These span temperate and tropical cereals, oilseeds and pulses.

The following sections describe how the GRDC is structured to deal with the complexities of investing in R&D on behalf of the grains industry, and approaches the task through clearly defined organisational and investment strategies, linked to rigorous risk management and performance measurement processes.

Structure

Board and management team

A board of nine directors governs the GRDC, while the Executive Management Team, based in Canberra, leads its nationwide operations. As well as advising the GRDC Board, the management team is responsible for realising the Board’s priorities and managing and evaluating R&D investments in the Australian grains industry.

National Panel

The National Panel includes the three regional panel chairs and the GRDC’s executive managers. It is the key body for developing and recommending to the Board the GRDC’s overall corporate strategies and direction. It also develops and recommends investments for the national elements of the research programs. In doing so, the panel considers advice from the teams that manage the GRDC’s R&D investment portfolio. The panel also assists the Board in establishing linkages with local grower groups and research providers.

Regional panels

The GRDC’s three regional panels develop and monitor the strategic directions for the regional elements of the research programs. The panels consider advice from the program teams and advance recommendations on investments with a regional focus to the GRDC Board, via the National Panel. Regional Panels also contribute to some national investment agendas, where this is critical to regional stakeholder interests. The panels also assist the GRDC by establishing linkages with local grower groups and research providers.

Background

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2 Crops with levies are:

Wheat

Course Grains: barley, oats, sorghum, maize, triticale, millet/panicums, cereal rye, canary seed

Pulses: lupins, field peas, chickpeas, faba beans, vetch, peanuts, mung beans, navy beans, pigeon peas, cowpeas, lentils

Oilseeds: canola, sunflower, soybean, safflower, linseed
Strategy

Strategic review

In 2004 the GRDC conducted a significant strategy review that led to the release of the GRDC strategic business plan, *The Way Forward*, in January 2005. This strategic document is both supplementary and complementary to *Driving Innovation*, the GRDC’s Five Year Research and Development Plan for 2002 to 2007, and articulates the GRDC’s response to:

- the complex and dynamic research environment we currently work in
- predictions for industry growth outlined in the Australian Grains Industry Strategic Plan 2005–25
- the rapid changes and consolidation occurring within the grains industry
- the changes occurring within state-based departments of agriculture
- the changing profile of the Australian graingrower.

At all levels of the organisation, the success of the strategy will depend on how it is owned and implemented to meet the needs of stakeholders and exceed their expectations.

Key findings

- If Australian graingrowers are to continue to effectively compete in global markets, the GRDC must take the lead role in coordinating and facilitating a national R&D grains agenda/portfolio.
- All of the GRDC (Board, management, staff and panels) must have complete alignment with and ownership of the agreed strategy.
- The GRDC must clearly articulate the strategy to its major customers (growers, Australian Government) as well as relevant sections (conscious of confidentiality) of the grains industry.
- The GRDC must meet and exceed the expectations of its customers. Growers need to understand and appreciate how GRDC delivers tangible value. This will be assessed through an annual survey of growers. The Australian Government needs to value the GRDC for its contribution to Ministerial priorities and for its sound corporate governance. This will be assessed through feedback from the Australian Government Department of Agriculture, Fisheries and Forestry.
- A national grains R&D portfolio must be developed with clearly defined ‘gateways’ and ‘pathways to market’.
- The principal ‘pathways to market’ are: Better Varieties Faster, Better Farming Practices Adopted Faster, New Products and Building Research Capacity.
- The GRDC must achieve Best Operating Practice in its core Business Processes and Enabling Functions.
- The market needs and signals must clearly feed back into and drive the R&D agenda.
- The GRDC agenda must also respond to the issues of sustainability of agriculture, addressing the ‘triple bottom line’ of people (society), planet (environment) and profit (economy).
- Where appropriate, the GRDC will work with private companies and other funding sources to leverage capital and expertise to improve/facilitate better paths to market, including through commercialisation of the outputs of R&D.
- The GRDC must fully embrace the corporation’s Mission, Vision and Values.
- The GRDC must be able to attract and retain top talent.

Implications for structure

In accordance with the key findings from the strategic review, the GRDC restructured its programs around ‘pathways to market’. This reflects a determination to structure around delivery to end-users and customers, rather than around types of crop or areas of research endeavour. It also reflects a decision to increase the number of operational business units and to have each of them driven at the executive manager level.

Also, previously there was only one operational business unit, namely Program Operations which had six programs, each with a corresponding output group, namely Winter Cereals, Crop Improvement, Crop Protection, Sustainable Farming Systems, Product and Service Delivery, and Value-Chain.

Figure 2 (page 10) outlines the relationship between the previous GRDC program structure and the new structure. The changes in program structure also flow through to a change in the executive management structure. Key features of the new structure include the following:

- The first pathway to market is based on ‘better varieties faster’. The Varieties pathway covers all activity where the benefit to stakeholders is delivered through genetic enhancement.
- The second pathway to market is based on ‘better practices adopted faster’. The Practices pathway covers all activity where on-farm benefit is delivered through changes in farming practice rather than through genetic enhancement.
The third pathway to market is New Products, which covers the off-farm benefit flows and corresponds closely to the previous Value-Chain program. The emphasis is on partnering with other sections of the value chain, ensuring that other parts of the chain contribute to the cost and that part of the benefit can be captured by graingrowers.

The fourth pathway is Building Research Capacity. This sits in Output Group 4 Communication and Customer Services. This is a broad, generic pathway where the primary means of delivering benefit is through delivery of information to stakeholders. It closely corresponds to the previous Product and Service Delivery Program, except that all grower group investments have been moved to the Practices pathway. There has also been an increased emphasis on building research capacity.

Core strategies
Figure 1 summarises the corporation’s core strategies identified during the review.

New business approach
The new strategy involves changes in our business approach, which will help the GRDC to actively take the lead role in coordinating and facilitating a national R&D grains agenda and portfolio. Figure 2 shows the relationship between the current and previous structures.

GRDC core business processes and enabling functions
The 2004 strategic review concluded that, to be sustainable, the GRDC must achieve best operating practice within three years in both core business processes and enabling functions. A critical success factor in moving towards this achievement in 2005–06 will be to fully implement the procurement policy and guidelines for the GRDC, and to define business processes for:

- identifying and prioritising R&D requirements
- managing the investment portfolio through the pathways to market
- delivering the outcomes of R&D in products and services
- evaluating the impact of R&D for stakeholders
- designing contract and procurement processes between the various lines of business.

Figure 1: The Way Forward, core strategies

Vehicles (How)
- Better varieties faster
- Better practices adopted faster
- New products
- Building research capacity
- Best operating practices (BOP) in all process and functions
- Assembling alliances, joint ventures and public/private partnerships
- ‘Gateway’ management on pathway to delivery

Arenas (Emphasis)
- Leader in agricultural R&D investment
- Whole of industry approach and buy in
- Reduce national R&D fragmentation and duplication
- Servicing graingrowers with high value technology and information
- Customer focused, performance driven culture
- Path to market – delivery and adoption
- Environment & Sustainability

Differentiators
- Funded by statutory levies
- National mandate & focus
- Independence
- Our people
- Panel system
- Breadth and strength of intellectual property
- Information base to develop products & services
- National “one stop shop” for agricultural R&D business

Core Strategies
Australian grain growers effectively competing in the global grain markets

Market driven R&D
Coordinate national grains R&D agenda/portfolio
Delivering government priorities
Growing and leveraging of total grains R&D investment
Staging (Speed & Sequence)
- Board approved
- Internal alignment
- Achieve BOP
- Verifying the national portfolio balance
- Set the agenda with ‘buy-in’
- Investigate structures
- Monitor implementation and performance
The GRDC will regularly monitor and report on implementation and performance during each of these processes, to ensure the future success of the strategy.

The review also identified the ‘enabling functions’ that equip the organisation to pursue its strategic objectives. Those functions are: Business Strategy and Planning; Information Management Systems; Corporate Communications; Risk Management; Quality System; Human Resources; Finance and Administration; and Corporate Governance. The strategies and aims of each of these enabling functions are discussed in Part 5.

**Strategic priorities**

**Portfolio priorities**

In The Way Forward, the role we perform in order to achieve our strategic outcomes is broken down into four core activities. To succeed, the GRDC must:

1. coordinate a national grains R&D portfolio and agenda
2. deliver against government priorities
3. promote the growth and leveraging of total grains R&D investment
4. promote market-driven R&D.

These four priorities are reflected in the GRDC investment portfolio, and form the basis for the detailed objectives and outputs described in Part 5 of this annual operational plan.

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**Figure 2:** Relationships between the previous and current organisational structures

**Outcome**

Through its commitment to innovation, an Australian grains industry that is profitable and environmentally sustainable for the benefit of the industry and wider community

**PATHWAYS TO MARKET**

- Varieties
  - Winter Cereals Improvement
  - Crop Improvement
  - Crop Protection
- Practices
  - Sustainable Farming Systems
- New Products
  - Value Chain and Business Development
- Communication and Customer Services
  - Product and Service Delivery

**ENABLING FUNCTIONS**

- Corporate Strategy and Program Support
- Corporate Services

**Figure Key and Notes**

- Dark Red – Lines of Business
- Black – Former Business Units and Programs

* A number of investments previously in the Crop Protection Program will be in the Varieties line of business
Business environment

The GRDC has traditionally defined itself in terms of the agricultural production sector of the grains industry. This remains the central reference point of the GRDC’s grower stakeholders. However, changes in the business environment and in the expectations of our stakeholders have broadened the GRDC’s scope of interest.

The nature of the GRDC’s work also has changed, and continues to change. Rather than being driven by proposals from researchers, our approach now relies on scoping and designing investments and negotiating their implementation. We have moved from a ‘grant’ paradigm to an ‘investment’ paradigm. This approach has required changes in processes, skills, workloads and access to networks and partnerships.

The key challenge facing the GRDC in the short-to-medium term is to continue coordinating and facilitating a national approach to grains R&D, so as to ensure a balanced R&D portfolio with reduced areas of fragmentation or duplication. In doing so, the GRDC will continue to foster integration of, and closer links between, grain producers, R&D institutions and downstream markets.

The following are some of the particular issues the corporation will face in the business environment of 2005–06.

- Globalisation of agribusiness and agricultural research is ongoing, producing many new cross-sectional alliances, mergers, acquisitions and joint ventures.
- The GRDC continues to work with its R&D partners to review strategic directions for barley breeding and pulse breeding. These are complex undertakings requiring extensive consultation and careful change management.
- Grower survey results indicate that, whilst most graingrowers are satisfied with the job done by the GRDC, many do not have a good understanding of what the GRDC does and how the benefits of its work are delivered. The GRDC must work to raise grower understanding and strengthen the GRDC brand.
- The Australian Grains Industry Strategic Plan 2005-25 has identified high levels of fragmentation and duplication in numerous aspects of the industry, including infrastructure, grower representation and R&D. The GRDC is in a unique position to work towards less fragmentation and duplication in the research arena.
- With new entrants to grain commodity markets (for example, Eastern Europe) the GRDC needs to work closely with marketers and bulk handlers, to identify and meet the needs of high value grain markets where Australia can secure competitive advantage—this particularly entails a focus on Asia.

Investment priorities

The investment priorities in 2005-06 are guided by the objectives and strategies of each of the four pathways to market described above (and shown in Figure 2). They are also guided by the five key themes of Driving Innovation, being: driving innovation; business driven; linking science, technology and adoption; being a global leader; and sustainability—the ‘triple bottom line’. Outputs consistent with these themes are delivered through each of the GRDC’s pathways to market and enabling functions.

The Australian Government’s National Research Priorities are reflected in the existing GRDC investment portfolio and will be reinforced in new investments, as follows:

- An environmentally sustainable Australia—through GRDC investments in developing practical environmental management systems for graingrowers
- Promoting and maintaining good health—by continuing to invest in research related to the assessment of food safety risks, and on-farm management of food safety, breeding for health related grain traits
- Frontier technologies and building and transforming Australian industries—by continuing to support wheat and barley molecular marker programs and other frontier breeding technologies
- Safeguarding Australia—through collaborative investments to discover and introduce plant genes to defend against pests and diseases, as well as improving pest and disease farming practices.

These are presented in more detail in Table 1.
The GRDC has identified key priorities for 2005–06, which will help to achieve the strategies set out in Driving Innovation and The Way Forward, including the following.

- **National Variety Trials**—Acting upon growers’ demands for independent crop variety evaluation, the GRDC is now restructuring its variety evaluation programs into nationally coordinated variety trials, which are open to all breeding programs and are independently assessed.

- **A coordinated national approach to barley breeding**—The GRDC along with industry is investigating the formation and operation of a more integrated, focused and efficient plant-breeding business, based on sound commercial principles. The opportunities such a business might present include sharing of industry linkages, access to a broader base of biotechnologies, integration of science and innovation capacity, and utilisation of common paths to market across southern Australia.

- ** Delivering on pulses**—The GRDC is working with industry to improve arrangements for pulse breeding in Australia to enhance our ability to develop reliable, broadly adapted pulse crops for rotation with wheat, and to ensure that stakeholder expectations about pulses are realistic. New investments in pulse industry extension will build on the successes of the new breeding arrangements.

- **New products**—The GRDC is developing and implementing a strategy to secure the involvement and co-investment of value-adding companies such as grain marketers and handlers, grain traders and food processors. This could include investments in biotransformation; noodle and dumpling wheat for Taiwan; the Cooperative Research Centre for Innovative Grain Food Products; or the Go Grains nutrition education program.

- **Farming systems**—The GRDC continues to work on achieving stakeholder buy-in to farming systems R&D, by leading grower groups and consultants to the proposed strategy, as well as preparing business, change management and implementation plans.

- **Biological Inputs for Profitable Farming**—The GRDC will invest in a commercialisation project that seeks to both maximise the benefit to growers arising from adoption of the new technology, and to obtain a reasonable return for the GRDC and its research partners.

- **Capacity building**—The GRDC will further progress a strategic review and audit of its investments to determine to what extent the portfolio should be invested in projects to specifically build research capacity (apart from the capacity inherent in normal research projects), and to determine how our research capacity returns value to, and remains with, our stakeholders.

- **Market driven/focus**—The GRDC will promote market-driven R&D to enable Australian grain growers to complete on world markets. This will include several market research undertakings, with a focus on Asia.

- **Proactively addressing the Australian Government research priorities**—The GRDC will continue its concerted efforts to integrate the Australian Government’s National Research Priorities and Rural R&D Priorities for rural R&D corporations into the corporation’s goals and priorities for new investment.

**Investment process**

The GRDC’s 2005–06 investment process is based on a three-stage cycle of strategy review, investment planning and implementation. After undergoing a rigorous review, in consultation with stakeholders, the GRDC Investment Plan 2005–06 was released to the research community in October 2004. This plan included all investments going to tender. The plan provides a clear indication of the GRDC’s investment priorities for 2005–06 that will complement the existing research portfolio and help to achieve the objectives outlined in both The Way Forward and Driving Innovation.

Increasingly, the GRDC is focusing on developing flexible business models and enabling strategic alliances, which provide access to additional capital and allow enhanced management of intellectual property.

The GRDC will continue to link science with business, and to commercialise research outputs where there are clear benefits to stakeholders, and where commercialisation allows further investment in developing good research outcomes.

The GRDC’s procurement process for each investment priority includes open tender as well as limited tender and direct negotiations. Additionally, introduced for 2005-06 investments was an ‘E-Concept’ process. This invites brief proposals via the GRDC website of especially innovative ideas with potential to make major contributions to grain growers’ benefit and profitability. It ensures a pathway through to the GRDC for high originality and innovation.
Annual operational plan

The GRDC’s annual operational plan is published in response to directions given in legislation and by the Australian Government. These are:

- section 25 of the Primary Industries and Energy Research and Development Act 1989, which requires the annual operational plan to describe how the activities planned for the year will satisfy the objectives and strategies outlined in the five-year R&D plan
- a ministerial direction which requires the annual operational plan to:
  - demonstrate a clear link to the outcome–output–input framework identified in the five-year R&D plan
  - include relevant performance information, as the subsequent annual report will require assessment and comment for its report on the GRDC’s achievement of planned outputs and outcomes
- comply with the enabling legislation and be consistent with the reporting requirements outlined in the Commonwealth Authorities and Companies (Report of Operations) Orders 2002 made under section 48 of the Commonwealth Authorities and Companies Act 1997
- a departmental direction which requires consistency with the outcomes, outputs and performance measures specified in the minister’s 2005–06 Portfolio Budget Statements.

Output groups

For the purposes of the annual operational plan and annual report, the GRDC’s operations are divided into output groups. Under the new structure arising from the 2004 strategic review, those four output groups are:

1. Varieties
2. Practices
3. New Products

The GRDC’s ‘outcome and outputs’ relationship is shown in Figure 3.
Performance measurement

As an Australian Government authority, the GRDC reports on its performance as part of the annual budget process, addressing agreed performance indicators set out in the Agriculture, Fisheries and Forestry Portfolio Budget Statements.

The output groups’ performance indicators are tracked by data sources, including annual surveys of the industry and government, covering:

- changes in the level of the Australian Government’s satisfaction (expressed in feedback from the Department of Agriculture, Fisheries and Forestry) with the extent to which the Australian Government’s National Research Priorities and the stated priorities for rural R&D are being addressed
- significant evidence of the GRDC taking a lead role in coordinating and facilitating the national grains R&D agenda
- graingrowers’ assessment of the GRDC’s performance (the target is for the proportion of growers giving a rating of ‘high’ or ‘very high’ performance to increase from 72% to 90% over a three-year period)
- improvements in the performance of the grains industry, measured by Australian Bureau of Agricultural and Resource Economics analyses of industry performance within the industry’s agroecological zones.

Other, corporate-level performance indicators are tracked by:

- assessment of innovation and flexibility in developing contractual relationships with the GRDC’s R&D partners
- assessment of the quality of the GRDC’s corporate governance, measured against Australian National Audit Office best practice guidelines.
Research directions

Stakeholder priorities

The GRDC’s investment portfolio is structured to address the expressed priorities of its key stakeholders, the Australian Government and the Australian grains industry.

**Australian Government**

The stakeholder priorities table below (Table 1) indicates how the GRDC’s R&D portfolio is linked to the Australian Government’s priorities for rural R&D, as announced by Senator the Hon. Judith Troeth, then Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry, in March 2003. These priorities are consistent with and reflect the National Research Priorities that were outlined by the Prime Minister in December 2002.

**Grains industry**

Industry priorities were identified in 2001 through GRDC consultations with the Grains Council of Australia (GCA) and graingrower workshops. Key industry priorities identified were:

- sustainability and resource management
- new and innovative product development
- development of new alliances and links to market
- bringing biotechnology to bear on sustainability and consumer benefit outcomes, to support profitable farming systems and access to premium markets
- effective and targeted transfer and adoption of technology and knowledge for Australian growers
- integrated pest management to minimise the total cost of pests, diseases and weeds, and to maintain options and control strategies
- genetic improvement and regional adaptation of new grain varieties for improved resistance to biotic and abiotic stress, and quality standards for specific end uses.

In addition, the GRDC has responded to strong industry demand for independent crop variety evaluation by establishing a National Variety Testing system in 2004.

GRDC investments in particular activities involving the GCA are discussed in detail in Part 6.

**Targeted research investment**

Each year the GRDC tailors its investment portfolio to best address the research priorities identified by its key stakeholders. Table 1 presents a summary of key investments in 2005–06 that address these priorities.
Priorities Relevant new GRDC investments

**Government**

**NRP-1**: An environmentally sustainable Australia

**RRDP-1**: Sustainable natural resource management.

- A joint project with the newly established Cooperative Research Centre (CRC) for Cotton Catchment Communities, to develop crop management systems that use less chemicals and produce more crop per unit of water used.
- Work to develop and deliver practical tools that enable Mallee growers to take account of seasonal and spatial variability, subsoil constraints, nutrient availability and soil diseases to substantially increase profit and reduce soil and nutrient losses as well as salinity risk.
- A project to develop best-practice guidelines for the use of Atrazine and related chemicals, to significantly reduce the potential for transport off-site.

**RRDP-2**: Improving competitiveness through a whole-of-industry approach.

- Market research partnerships with AWB International and other marketers and bulk handlers.
- The establishment of a National Barley Breeding Program with three regional breeding nodes: in the west, the southeast and the north. This will ensure a nationally coordinated approach to barley breeding in Australia.
- The GRDC is evaluating options for undertaking late-stage evaluation of new pulse varieties at the regional level, including incorporation into the National Variety Trials system established in 2004-05 for cereals.
- Work to ensure a nationally coordinated approach to increasing the adoption of grain storage best-management practices. The focus is on managing grain quality in on-farm storage systems and assisting growers to better understand quality related issues related to end-user requirements.

**NRP-2**: Promoting and maintaining good health

**RRDP-3**: Maintaining and improving confidence in the integrity of Australian agricultural food, fish and forestry products.

- A new initiative on food safety risk management. This project will develop packages containing food safety management advice and distribute them to growers, advisers and other industry members.

**RRDP-4**: Improved trade and market access.

- Projects to develop new wheat varieties with quality attributes that are suited to overseas markets and can compete with Canadian/United States red wheats and hard white wheat in Asia. This project is particularly focused on gaining a share of the sponge and dough bread market in Asia.
- Development of wheat and barley varieties with altered starch qualities suitable for a range of food and industrial applications.

**NRP-3**: Frontier technologies for building and transforming Australian industries

**RRDP-5**: Use of frontier technologies.

- International collaboration to advance the use of doubled haploids in field pea and chickpea breeding programs.
- Projects to identify molecular markers for new sources of disease resistance—against, for example, blotch diseases in bread wheat or crown rot in durum wheat.
- A project to test a new objective grain quality testing method that determines average grain size and the distribution of grain sizes within a wheat sample. A better understanding of the relationship between these attributes and subsequent flour extraction and quality will assist growers to receive fair value for small grain.

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3 **NRP** refers to one of the Australian Government’s four National Research Priorities.
4 **RRDP** refers to one of seven Ministerial Priorities for Rural R&D Corporations and Companies.
<table>
<thead>
<tr>
<th>Priorities</th>
<th>Relevant new GRDC investments</th>
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<tbody>
<tr>
<td><strong>Government</strong></td>
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<tr>
<td><strong>NRP-4: Safeguarding Australia</strong></td>
<td>• A project with the newly established CRC for National Plant Biosecurity to develop a farm biosecurity and incursion management framework for the Australian grains industry. This will build on previous work to identify key incursion risks.</td>
</tr>
<tr>
<td><strong>RRDP-6: Protecting Australia from invasive diseases and pests.</strong></td>
<td>• New work to enhance yields in the northern and southern cropping regions through better management of cereal foliar diseases. The projects will identify disease risks and suitable management packages that integrate varietal, cultural and chemical options for disease control in each region.</td>
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<tr>
<td></td>
<td>• Work to improve knowledge of epidemiology of botrytis diseases and integrated management of pulse diseases in Mediterranean environments.</td>
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<tr>
<td><strong>RRDP-7: Creating an innovative culture.</strong></td>
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<td>• Work to develop and deliver rapid soil tests to growers, to improve decision making. The work will target crucial soil characteristics, usually at various depths, that are of most interest to growers, such as water and nutrient levels available for plant growth, soil strength and acidity, and any subsoil constraints. The objective is to have more timely information for fertiliser decisions.</td>
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<td></td>
<td>• New projects to support the professional development of growers, advisers and researchers, to enhance their capacity to support ongoing industry development.</td>
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<tr>
<td><strong>Industry</strong></td>
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<tr>
<td><strong>Sustainability and resource management:</strong></td>
<td>• Work to further develop agronomic and management practices for the use of pastures in cropping systems. The project will emphasise the potential benefits of incorporating a pasture phase into rotations, which include a disease break, better management of herbicide resistance in weeds, increased soil fertility and health, management of salinity with perennial pastures, and increased returns from livestock.</td>
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<tr>
<td><strong>• farming systems and rotations to protect and enhance the soil and water resource base</strong></td>
<td>• Work to further develop and demonstrate the benefits of using raised-bed cropping techniques to manage surface water in waterlogged and saline land.</td>
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<tr>
<td><strong>• genetic improvement for sustainability.</strong></td>
<td>• A project with the CRC for Plant Based Management of Dryland Salinity to assess the commercial potential of perennial wheat in Australia. A scoping study will examine the feasibility of developing a perennial wheat, its path to market and a business case for its development.</td>
</tr>
<tr>
<td><strong>New and innovative product development:</strong></td>
<td>• The development of new cultivars of low-protein, soft-grained wheat varieties for export to niche markets. The project aims to increase the financial return available from growing wheat in regions where it is more difficult to grow high-protein wheats, such as in some parts of the Western Region.</td>
</tr>
<tr>
<td><strong>• identify premium markets to enhance grower returns</strong></td>
<td>• Development of wheat and barley varieties with altered starch qualities suitable for a range of food and industrial applications.</td>
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<tr>
<td><strong>• ensure flow of market signals.</strong></td>
<td></td>
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<tr>
<td><strong>Develop new alliances and links to market.</strong></td>
<td>• Work to develop a closer alliance between Australia’s grains and pork industries. This collaborative project between the GRDC and the new CRC for an Internationally Competitive Pork Industry will explore opportunities to improve the competitiveness of the pork industry while adding value to feed grain products. Relevant areas for research include development of superior feed grain varieties, new tools for grain quality testing, and new supply chain arrangements that lead to more reliable and secure supplies of dietary energy and protein for pork production.</td>
</tr>
</tbody>
</table>
## Table 1: Investments to meet stakeholder priorities

<table>
<thead>
<tr>
<th>Priorities</th>
<th>Relevant new GRDC investments</th>
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<tbody>
<tr>
<td><strong>Industry</strong></td>
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<tr>
<td>Bringing biotechnology to bear on sustainability and consumer benefit</td>
<td>• Projects to identify molecular markers for new sources of disease resistance—against,</td>
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<tr>
<td>outcomes, to support profitable farming systems and access to premium</td>
<td>for example, blotch diseases in bread wheat or crown rot in durum wheat.</td>
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<td>markets.</td>
<td>• A project seeking to identify key traits responsible for efficient water and nutrient uptake</td>
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<td></td>
<td>in the root systems of cereals. This work aims to identify whether the desirable traits</td>
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<td>exist in Australian germplasm collections and investigate the feasibility of incorporating</td>
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<td></td>
<td>such traits into adapted germplasm.</td>
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<td></td>
<td>• New work under the Soil Biology Initiative to exploit genetic variation for root exudate</td>
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<td>production in wheat, to manage soil biology and increase yield.</td>
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<tr>
<td>Effective and targeted transfer and adoption of technology and knowledge</td>
<td>• Work to develop and deliver rapid soil tests to growers, to improve decision making.</td>
</tr>
<tr>
<td>for Australian growers.</td>
<td>The work will target crucial soil characteristics, usually at various depths, that are of</td>
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<td></td>
<td>most interest to growers, such as water and nutrient levels available for plant growth, soil</td>
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<td></td>
<td>strength and acidity, and any subsoil constraints.</td>
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<td></td>
<td>• New work to develop partnerships with agribusinesses, farm advisers and trainers from the</td>
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<td>private and public sectors, to enhance dissemination, diffusion and application of</td>
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<td></td>
<td>knowledge in the grains industry.</td>
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<tr>
<td>Integrated pest management:</td>
<td>• Further investments in IPM for major insect pests of pulses in northern Australia,</td>
</tr>
<tr>
<td>• to minimise total cost of pests, diseases and weeds</td>
<td>including mirids, silverleaf whitefly, pod sucking bugs and <em>Etiella</em>.</td>
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<tr>
<td>• to maintain options and control strategies.</td>
<td>• New work to identify practices to enhance beneficial species for use in IPM strategies for</td>
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<td></td>
<td>broadacre agriculture.</td>
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<td></td>
<td>• A project to demonstrate how a farming systems approach, incorporating crop rotations,</td>
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<td></td>
<td>can help control root lesion nematodes and increase crop yield.</td>
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<tr>
<td></td>
<td>• Work to improve knowledge of epidemiology of botrytis diseases and integrated management of</td>
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<td></td>
<td>pulse diseases in Mediterranean environments.</td>
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<tr>
<td></td>
<td>• A feasibility study on the potential application of novel genetic approaches to control</td>
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<td>pest land snails.</td>
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<tr>
<td>Genetic improvement and regional adaptation of new grain varieties:</td>
<td>• Various projects seeking to develop novel interspecific hybridisation techniques for lupins</td>
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<tr>
<td>• improved resistance to biotic and abiotic stress</td>
<td>and chickpeas. The aim of this work is to be able to transfer desirable traits—such as</td>
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<tr>
<td>• quality standards for specific end uses.</td>
<td>higher protein or oil content, thinner seed coat, herbicide tolerance or disease resistance—</td>
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<td></td>
<td>between related pulse species.</td>
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<tr>
<td></td>
<td>• A project to increase the yield of sorghum by developing new hybrids with greater drought</td>
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<td>resistance, based on the ‘stay-green’ trait.</td>
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<tr>
<td>Independent variety evaluation.</td>
<td>• The GRDC is evaluating options for undertaking late-stage evaluation of new pulse</td>
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<td></td>
<td>varieties at the regional level, including incorporation into the National Variety Trials</td>
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<td></td>
<td>system established in 2004-05 for cereals.</td>
</tr>
</tbody>
</table>
Planned outputs

- Variety testing and performance data made available to Australian graingrowers
- New improved varieties released to the Australian grains industry
- New advanced germplasm and molecular markers developed and incorporated into breeding programs
- New genes with potential importance to the Australian grains industry discovered, and made available for further development following proof of concept
- New breeding technologies developed and made available to researchers and plant breeders
- Variety-specific agronomic information made available to graingrowers
- Industry learning and skills development targeted to enhance research capacity into the future

Objectives

- To develop and commercialise new superior crop varieties with significantly enhanced production and market performance compared to current benchmark varieties in Australia
- To accelerate the rate of gain in key genetic traits of importance to the Australian grains industry
- To improve overall effectiveness and cost efficiency of GRDC-supported crop improvement programs in Australia

Performance indicators for 2005–06

- Crop variety testing—establishment of the National Variety Trials Program in consultation with research partners and industry stakeholders
- Wheat breeding programs—achievement of key milestones for 2005–06
- Barley breeding—establishment of a nationally coordinated program for barley breeding, with strong market links
- Pulse improvement—establishment of a nationally coordinated program for field peas, chickpeas, lentils, and faba beans, with strong market links
- Importation of new wheat germplasm—coordinate arrangements for the introduction and evaluation of CIMMYT (International Maize and Wheat Improvement Centre) germplasm for Australian breeding programs
- Genetic resources centres—establishment of a nationally coordinated project for the curation of crop and pasture plant species for Australian agriculture
- Major research programs—Achievement of key milestones for 2005–06 for the Australian Centre for Plant Functional Genomics, Cooperative Research Centre for Value Added Wheat, Cooperative Research Centre for Molecular Plant Breeding, and the Australian Winter Cereal Molecular Marker Program
Achieving the objectives

Scope

The Varieties output group reaches across the GRDC’s 25 leviable crops, spanning cereal crops (including wheat and barley), summer coarse grains, pulses and oilseeds.

The output group includes GRDC investments in gene discovery, breeding technologies, genetic resources, functional genomics, germplasm enhancement, genetic transformation, plant breeding, crop variety testing, grain quality research, plant pathology (where directly related to breeding), and education.

The output group supports crop improvement for growing domestic industries, as well as for export, with the aim of raising the overall value of the Australian grains industry. The continuing prosperity of the industry depends on the development of new varieties with enhanced yields as well as quality attributes that add value and meet market demands. The latter is being achieved by collaborating with grain marketers and bulk handlers to clarify end-user requirements. Growing superior high-yielding varieties using optimal systems for crop management will lead to increased productivity.

The search for new sources of disease resistance to incorporate into crop plants continues, alongside research to improve our understanding of the processes involved in resistance breakdown.

Investment strategies

Winter cereals

Major investment will continue in 2005–06 in wheat and barley breeding.

The introduction of novel germplasm is recognised as a key contributor to the development of new varieties. The GRDC has been building on international collaborations, through centres such as CIMMYT in Mexico and ICARDA (the International Centre for Agricultural Research in the Dry Areas) in Syria, that have made major contributions to the long-term productivity and sustainability of the national grains industry. The GRDC is putting new arrangements in place to coordinate the introduction and evaluation of new genetic material in existing projects with CIMMYT, and to enhance the delivery of new genetic material to cereal breeding programs.

Investment in new technologies includes funding for the Australian Winter Cereal Molecular Marker Program, which was extended for three years from July 2004, with emphasis on the validation and implementation of markers for breeding programs. Support is also being given to gene discovery for plant improvement, through basic research projects that include a substantial partnership in the Australian Centre for Plant Functional Genomics. Investment is also being made in two cooperative research centres, the Cooperative Research Centre for Molecular Plant Breeding and the Value Added Wheat Cooperative Research Centre, to further enhance the technological base for cereal crop improvement.

Support is also being provided for R&D related to cereal quality. In particular, further investment is being made in projects that aim to eliminate serious grain defects such as pre-harvest sprouting, blackpoint, and late maturity alpha-amylase production. The GRDC is also collaborating with AWB International and other major grain exporters to develop wheat varieties with quality attributes that are suited to Asian markets.

The importance of breeding for resistance to pathogens is also recognised, and genetic approaches to disease control are being supported. A new initiative being developed for support in 2005–06 specifically targets fungal blotch diseases caused by Septoria nodorum and Septoria tritici.

Understanding and manipulation of the genetics of both pest and crop host continue to provide growers with crop varieties that are resistant to key pests and diseases and, through gene discovery, promise new approaches to crop protection. The identification of plant genes that provide protection, and of pest genes that provide targets for novel control technologies, is an important part of this output group.

Long-term investments in major initiatives such as the Australian Cereal Rust Control Program—which brings together the CSIRO, CIMMYT, the University of Sydney and the GRDC in a combined effort to reduce the impact of cereal rusts—continue to prove their worth to Australian graingrowers. In 2005–06, new cultivars planned for release include a Janz-like cultivar with enhanced rust resistance, and a second replacement for the rust-susceptible wheat variety H45. Another long-term investment in the GRDC–CSIRO joint venture Grain Protection Genes will also be maintained.

The GRDC is also supporting the curation of Australia’s collection of plant genetic resources. With support from Australian Wool Innovation Ltd and other organisations, the GRDC is promoting the coordination of crop and pasture plant germplasm collections under a national program to achieve greater efficiencies in their operation.

Canola

The GRDC will continue to support the National Brassica Improvement Program, which is focused on improving the quality, yield, disease-resistance and agronomic performance of canola, as well as progressing the
Planned outputs

OUTPUT GROUP 1: VARIETIES

advance of speciality cultivars (such as varieties high in oleic acid and low in linoleic acid), and promoting *Brassica juncea* for low-rainfall environments. A particular focus of canola breeding programs is identifying new genetic sources of resistance to blackleg. This is needed to re-establish blackleg resistance in canola, which has been breaking down in recent years. The breeders are working closely with other researchers seeking agronomic solutions.

*Sorghum*

Sorghum is well adapted to dry environments, and it is likely that the sorghum genome contains a range of drought tolerance mechanisms. The identification of the genes and gene networks that contribute to that drought tolerance trait could be important both for sorghum and for other crops. Accordingly, the GRDC will continue to invest in a collaborative project with overseas scientists to identify those genes. The project enables Australian researchers to capitalise on significant United States investment and collaboration to assist plant breeders to more efficiently breed sorghum and other crops that perform well in the water-limited environments that are common in Australia.

**Pulses**

Lupins are a significant crop in Australia—they play an important rotational role for the wheat crop, and provide an important cash crop supported by large domestic and overseas markets. Pearl lupin (*Lupinus mutabilis*) is a new lupin species with higher oil and protein content than the more widely grown narrow-leaf lupins. The higher oil and protein content makes it highly attractive to the stockfeed industry and may open up new markets for lupins. Although work on this species is at an early stage, the GRDC will continue to invest in this crop to ascertain its potential. Given increasing interest in lupin protein isolates and concentrates for the human food ingredient and higher protein feed markets, pearl lupins may have an important role to play.

Australia has a large collection of lupin lines across all the species, but this material has not been fully characterised to record all the desirable traits. Therefore, the GRDC will support the further characterisation of this germplasm and create a core collection that represents the diversity within each species. These subsets will subsequently be used by the breeders to obtain germplasm with desirable traits. This has the potential to increase lupin productivity in a large range of environments, and to provide valuable new germplasm for breeding programs.

The GRDC will also invest in two projects that aim to develop viable interspecific hybridisation techniques for chickpeas and lupins. The projects link into work that is already in progress at the University of Western Australia and, if successful, will greatly assist in the development and introduction of desirable traits into pulse-breeding programs.

Vetch is another versatile crop adopted by growers as a pulse rotation in the low-rainfall areas of southern Australia. In some areas vetch is virtually the only reliable pulse option. Substantial progress has been made towards the use of vetch as a multipurpose crop: it has rotational benefits for the cereal crops that follow, is a valuable, high-protein feed grain for the sheep and pig industries, and is a component in export hay. In 2005–06, the program will focus on breeding for increased disease resistance, especially against ascochyta and rust, as well as on breeding a variety with lower anti-nutritional factors. Weed control is often a major problem in the pulse phase of crop rotation, as there are a limited number of selective herbicides capable of controlling weeds without harming pulse crops. Most herbicide trials for pulses have been undertaken on non-acidic soils, but recent studies have found that some herbicides affect pulses differently on acidic, sandy soils. The GRDC will provide support for screening the pulses suited to the western region for their tolerance to a range of herbicides on acidic, sandy soils. The project will build on the existing expertise at the University of Western Australia and be linked to other weed management work in Western Australia to develop a comprehensive herbicide management package for pulses. This will open up new opportunities to increase the use of pulses in crop rotations.

**Commercialisation**

As in previous years, during 2005–06 the GRDC and its research partners will make substantial investments in the breeding of new plant varieties. The intellectual property in these new varieties is co-owned by the GRDC and its research partners. In recent years, a dozen or more new varieties have been commercialised annually and, subject to successful field trials, it is anticipated that a similar number of new varieties will be ready for release in 2005–06.

Where GRDC plant-breeding investments are made with institutional research partners, the GRDC is actively involved in seeking plant breeders’ rights and the commercialisation of each new variety. This activity includes both the selection of licensees and the negotiation of suitable agreements. Where the GRDC invests in plant breeding in the private sector, the private sector company will be responsible for commercialising any new varieties produced, and the GRDC will participate in the commercialisation process through research or equity arrangements, as negotiated.
Planned outputs

- New technology and practices to overcome soil constraints, harness the benefits of soil biota, and extend cropping rotation options
- Integrated farm management practices that enable diverse farming businesses responsive to product prices; protect crops from disease and weed invasion; assist in overcoming subsoil constraints; improve opportunities for nutrient inputs, particularly nitrogen fixation; and allow for weather and climate variability
- Natural resource management practices integrated into viable farming systems that lead to efficient water use and reduced drainage below the root zone; provide for efficient nutrient uptake; improve catchment management of salinity and water quality; and develop new learning methods
- Improved management of weeds, diseases and pests through a better understanding of their biological interactions with crop plants
- Increased diversity of crop protection strategies through understanding and use of the genetics of pest or host
- Improved risk management through rapid identification of and response to threats
- Management options that conform to economic, environmental and social demands

Performance indicators for 2005–06

- Implementation of a stratified survey to measure current on-farm practices such as the use of gypsum and lime for soil amelioration, controlled traffic, precision agriculture, variable rate technology, nutrient budgeting, risk management tools, the monitoring of water use and deep drainage, and the sowing of perennial pasture species
- Faster adoption of new practices, including targeted sustainable on-farm practices and technologies, by graingrowers
- Increased number of farmers involved in grower groups
- Enhanced management options for cereal foliar and root diseases across agroecological zones
- Increased farmer awareness and adoption of weed management practices that delay the development of herbicide resistance
- Identification of new approaches to crop protection, including the use of genetic manipulation of weeds, pathogens, invertebrate pests or crop hosts

Achieving the objectives

Scope

The Practices output group aims to develop optimal farm management practices that, when used to grow superior high-yielding varieties, will lead to increased productivity from sustainable grain production systems. Better farming practices contribute to increased productivity by minimising yield losses caused by a broad and constantly changing spectrum of biotic and abiotic stresses, such as weeds, diseases and invertebrate pests, poor soils and variable climate. The scope of the output group’s activities includes developing and validating new technologies to better manage crop threats before harvest and maintain grain quality after harvest, and integrating those technologies with existing farming practices. The output group also focuses on developing solutions that are cost effective, innovative and diverse.

The increasing complexity of farming systems, and the need to reduce reliance on traditional chemicals due to the development of pest resistance, provide crop protection challenges that demand integrated solutions. Increasingly, the challenge is to integrate control methods not only within pest categories but also across them, in an effort to develop whole-of-farm...
management strategies that reduce crop protection costs.

As we develop a better understanding of the genetics and diversity in both pests and crop hosts, our ability to manipulate pest-host interactions increases, providing farmers with vital alternatives to traditional mechanical and chemical solutions.

Another important focus is slowing the development of herbicide resistance in several important weed species. Research in this area is seeking to develop more sustainable weed management practices to delay the onset of resistance in regions and cropping systems at risk, as well as to develop alternative control strategies where herbicide resistance already exists.

The output group also supports education, training and other capacity-building activities that facilitate on-farm practice change and allow the grains industry to make the best use of new technology.

**Investment strategies**

**New technology**

The development of new technology remains central to an innovative and productive grains industry. Two new crop protection initiatives in 2005–06 seek to capitalise on past successes within and outside the field of agriculture, to extract value for graingrowers. In one project, a model system that has provided valuable advances in human pathology will be the subject of an exploratory study seeking new methods to control plant parasitic nematodes. The second project will explore the feasibility of applying novel genetic techniques to the control of pest land snails.

The development of immuno-contraceptive technology for the control of mouse plagues will continue in 2005–06 through the GRDC partnership with the Cooperative Research Centre for Pest Animal Control (to be replaced in July 2005 by the Cooperative Research Centre for Australasian Invasive Animals). Existing long-term investments in the Cooperative Research Centre for Australian Weed Management and the Crown Rot Initiative will be maintained.

New investments in real-time and near-real-time soil testing will assist growers to be more efficient in their on-farm operations. Major investments in 2005–06 will also include ongoing projects on applying precision agriculture; improving nutrient management; identifying ways to overcome surface and subsoil constraints; managing natural resources (especially through the Grain and Graze program); and managing climate variability and risk. Better training of growers—in ways to measure the level of soil water available for crop growth and make management decisions accordingly—is another focus for the year, with workshops planned for southern and western Australia.

A major review to be carried out in 2005–06 will conduct an audit of relevant emerging technologies in each GRDC agroecological zone and subzone. The findings will be used to explore and prioritise investment options on the basis of their likely returns to the industry. The emerging technologies deemed most likely to improve whole-of-farm profitability while protecting and enhancing the resource base will subsequently be selected for investment support and promotion to growers. The emphasis will be on achieving increased profitability and sustainability for the greatest number of growers collectively managing the largest area of cropping land.

It has long been believed that grower groups play an important role in increasing the on-farm adoption of better practices by providing a network of farmers willing to help validate new technologies and practices, and integrate them with existing farm management practices, in various regions. A major review and development of a business case in 2004-05 has identified and documented the many benefits that arise from the GRDC’s ongoing investment in grower groups across Australia. The business case has provided a basis for continued investment in 2005-06.

**Agronomy**

Canola production in Australia has declined in recent years. To address this, the GRDC will continue to invest in research to identify and develop solutions to the key constraints to canola production. New projects will look specifically at agronomic factors such as paddock nutrition, subsoil acidity and lack of root penetration. This work complements an existing GRDC-supported project, undertaken by Oilseeds WA, that works with growers and industry to provide production packages for high-, medium- and low-rainfall environments of Western Australia.

Recognising that grain production makes up only part of mixed-enterprise farming operations in many parts of Australia, the GRDC is continuing to explore opportunities to collaborate with research organisations dedicated to related agricultural enterprises. Mixed-enterprise farms in southern cropping regions mostly comprise grain–livestock production systems, whereas in the north cotton is often grown in rotation with grain crops. Following the tradition of the Grain and Graze program, which was established to study agronomic issues common to grain and livestock producers, the GRDC is set to become a partner in the new Cooperative Research Centre
This new partnership will identify research areas of common agronomic interest to the grains and cotton industries, including chemical use, soil health and water availability.

Similarly, since pasture remains a major use of land in rotation with grain crops, a business case is being prepared for investment in pasture research collaborations with organisations dedicated to livestock industries (such as Australian Wool Innovation Ltd, Meat and Livestock Australia, the Rural Industries Research and Development Corporation, and Dairy Australia). The business case will look beyond species improvement to examine the whole pasture value chain. This study will form the basis for collaborative, whole-of-farm approaches to pasture research in future.

**Integrated control methods**

Improved understanding of the biology of pests (weed, disease and invertebrate) remains fundamental to the investment strategy for crop protection. Application of this knowledge through integrated management practices increases the efficacy of control and reduces reliance on single, reactive pest control options.

One of the principal benefits of an integrated approach is improved sustainability of farming systems. For example, herbicides have given farmers unprecedented control over the weed burdens that reduce crop yield. However, biological systems do not forgive over-reliance on any single management tool, such as herbicides, and the grains industry is rapidly approaching the point where diversity of weed management practices, rather than percentage weed control in any one year, will determine success.

Integrated control methods are also being sought to address disease threats such as the breakdown of blackleg resistance in canola. Blackleg disease remains the major threat to the sustainability of the Australian canola industry and the GRDC continues to invest in work to discover the reasons for the breakdown and search for a solution. This includes identifying new sources of genetic resistance to blackleg, as well as developing better management packages.

**Biosecurity**

Incursions are a constant threat to agriculture, and changing farm practices create new opportunities for existing organisms to flourish. The ability to detect and respond rapidly to new and emerging pest threats is critical to sustaining Australian export markets and a competitive advantage. The newly formed Cooperative Research Centre for National Plant Biosecurity will provide an important vehicle for GRDC investments seeking to develop tools that detect and respond to new crop threats.

**Commercialisation**

At the farm level, the majority of the Practices outputs are delivered as pest management recommendations and other practical advice on the sustainable management of crop threats. Most of these outputs are delivered straight to growers through the GRDC and its partner research organisations (notably state agencies, cooperative research centres and grower groups), with no commercial value extracted on the way.

Similarly, a number of predictive models developed in GRDC-funded projects are widely used by agricultural advisers and consultants, but none is sold commercially. Examples include the Ryegrass Infestation Management tool and models that guide weed management practices to minimise the development of herbicide resistance.

A commercial PreDicta B soil-borne pathogen test was enhanced in 2004 by the addition of a crown rot analytical tool.

An area expected to deliver a commercial return for the GRDC and its partners involves biological inputs for farming systems. The GRDC has made significant investments in soil biology research between 2001 and 2007. Part of that expenditure has been directed towards the development of new biological soil inoculants for cereal and other crops. A business case recently developed as part of a related commercialisation project, Biological Inputs for Profitable Farming, seeks to maximise the benefit to growers arising from adoption of this new technology, as well as to obtain a reasonable return for the GRDC and its research partners. Commercialisation options have been assessed and the best way to proceed will be determined in 2005–06.
Planned outputs

- Grain market intelligence and value chain analysis to improve the market orientation of GRDC investments and Australia’s competitive performance
- Sustainable grain storage technologies to support efficient industry logistics and grain marketing
- Quality management strategies and technologies to assist industry, including growers, to assess and manage grain quality
- Food safety management strategies and technologies to improve public health outcomes and reduce market risk
- New food, feed and industrial products to improve grower margins and Australia’s competitive performance
- Initial investigation of technologies to assist growers in the analysis on-farm of soil and grain properties

Performance indicators for 2005–06

- Commencement of a situational analysis of on-farm grain storage, taking into account the needs of growers, identifying storage options and the impacts that they could have on other value chain participants
- Collaboration with three or more value chain participants, ensuring that Australian grain participates more effectively in Asian markets
- Commercial evaluation and testing of biological inputs for profitable farming, enabling final commercialisation arrangements to be established
- Development of a business case for the commercialisation of a suite of new grain fumigants, and the commercialisation of these fumigants through to the negotiation of suitable licensing arrangements

Achieving the objective

Scope

The New Products output group targets opportunities both pre- and post-farm gate, by investing in R&D in new grain food products and new farm products and services, providing growers with additional options in farm management and marketing.

A key component of the work of the output group is delivering products to growers, through bundling GRDC co-owned intellectual property, accessing external intellectual property and preparing robust business cases to facilitate the commercialisation of new products.

The identifying features of this output group include a market-driven approach to managing investment, the attraction of international collaborators and co-investment by third parties, as well as a portfolio of investments that require significant capital and time before their R&D produces outcomes ready for delivery and adoption.
Activities are solidly focused on innovative and leading-edge R&D that gives rise to the development of novel technologies.

Overall, New Products will work closely with other GRDC output groups to identify investments that can be successfully promoted from the early stages of R&D to clear pathways to market.

**Investment strategies**

**New uses**

Investments in new grain products for food and other uses will be a focus for this output group throughout 2005–06. New Products will continue the GRDC investment in the Cooperative Research Centre for Innovative Grain Food Products. Several opportunities for co-investment in functional foods will be explored, with a continuing strategy to develop niche products that can provide increasing levels of differentiation.

Similarly, several opportunities relating to new grain products for industrial use will be explored. The GRDC–CSIRO four-year joint investment in the development of crop biofactory technology and products will commence. In the coming year the work will be focused on the areas of industrial oils, complex monomers and protein biopolymers, as well as intellectual property development, which will serve to attract future third-party investors.

The Premium Grains for Livestock Program will continue as a collaboration with end-use industries. This year will see the finalisation of the database compilation, and the commencement of database interrogation to identify grain characteristics that are closely related to end-use characteristics. NIR (near-infrared) calibrations will be refined, and the GRDC will work on programs to look at more effective breeding for selected feed grains. Also as part of a larger collaborative program involving industry and end-use companies, 2005–06 will see New Products finalising the commercialisation of lupin-based products for aquaculture needs.

**Quality testing**

A continuing key objective will be the development of grain quality testing using near-infrared (NIR) and mid-infrared (MIR) technologies. These measurement tools are designed to enable growers to maximise the value of their grain crops or improve their input or management practices. A scoping study will be undertaken to determine what measurements are most useful to growers, and whether third-party-owned intellectual property can be accessed and adapted for on-farm use by growers and their advisers.

**Storage**

Grain storage will continue to be a key investment area for the GRDC, managed by New Products. Maintaining the effective use of phosphine is a priority for stored-grain research, and a major initiative will be to define phosphine priorities for the whole grains industry, including growers, researchers and bulk handlers.

The study of chemical strategies for the management of grain storage pests will be ongoing in 2005–06 in all regions.

Most notably, the phosphine resistance monitoring and management investment will continue, as stored-grain pests continue to develop resistance to phosphine and other chemicals.

A major investment in optimising grain yield and quality by exploring the use of integrated high-moisture harvesting and grain storage strategies will continue this year. Research in this area has the potential to reduce the risk of harvest downgrading, resulting in an overall positive impact on grower profitability.

Another endeavour in relation to grain storage will be the investigation of novel storage technologies such as harvest bags. Novel storage has the potential to deliver greater flexibility to growers and can form part of an important, integrated grain harvest–storage strategy.

**Commercialisation**

The Biological Inputs for Profitable Farming Project is an example of bundling the intellectual property developed by a number of GRDC research partners and combining that with intellectual property owned by an external party or parties. The resulting technology is designed to reduce the grain production losses due to soil disease, and to improve productivity through growth promotion mechanisms. It is expected that, following a period of commercial testing and evaluation, commercialisation arrangements will be completed in 2005–06.

As a supporting function, market intelligence will continue to inform the overall direction of the output group, and will be incorporated in decision-making and investment strategies across the New Products portfolio.
**Planned outputs**

- Effective communication infrastructure in place, including a range of newly developed and existing mechanisms that can deliver targeted information to different stakeholder groups as required
- Information, products and services that maintain or increase GRDC's competitive advantage and are considered relevant and timely by GRDC's segmented customer base
- Critical mass of research capacity in Australia that is dedicated to meeting the current and future research needs of the Australian grains industry—this includes consideration of R&D facilities and infrastructure, but is particularly focused on building human research capacity
- Strong links between domestic agricultural research centres, including state departments of agriculture, universities, cooperative research centres, the CSIRO, breeding companies and public–private joint ventures
- Strong links between researchers and their target audiences—such as grower groups, other R&D extension agents and individual growers—in order to facilitate learning and allow the industry to make the best use of research outcomes
- Talented students and researchers being attracted to and staying in agricultural disciplines
- Successful completion of an audit of skills, capabilities and research capacity presently available to support the domestic grains industry
- Publication of an audit report that accurately maps existing research capacity and identifies future needs, to include details of the levels and types of support available from all parties (the GRDC and research partners) that contribute to existing research capacity
- A new strategy in place to address the research capacity needs of the industry, specifying how research capacity is to be strengthened, by whom (responsibility) and by when (timeline); the milestones to be achieved along the way; and resourcing issues
- The research capacity requirements of GRDC stakeholders and research partners identified via consultation and incorporated into the new strategy

**Objectives**

- To deliver targeted and integrated information on research outputs arising from the GRDC's total R&D investment to all stakeholders
- To facilitate effective communication of GRDC's R&D outcomes to all its identified customer segments
- To build critical mass in research capacity in collaboration with GRDC's research providers that is able to maintain high-quality research standards and deliver against current and future needs of the Australian grains industry
- To identify the best means to attract and retain talented students and researchers in agricultural disciplines—such as breeding, agronomy and entomology—which benefit the grains industry

**Performance indicators for 2005–06**

- An increasing proportion of growers adopting new varieties and practices over the past two years due to GRDC activities, identified through an ongoing tracking survey of graingrowers
- An increasing level of customer satisfaction with GRDC organisational performance as a whole, and with the delivery of new and relevant information, products and services in particular, assessed by annual survey of GRDC stakeholders
- Greater utilisation of GRDC training and travel awards, and enhanced communication and extension of the knowledge and experiences gained
Achieving the objectives

Scope
A strategic review of the GRDC research portfolio carried out in 2004 reinforced the case that maximum benefits are delivered to Australian grain growers via two distinct pathways: through having better crop varieties adopted faster, and through having better farming practices adopted faster. Effective communication of information on these two key pathways is essential to facilitate faster adoption. Accordingly, the Communication and Customer Services output group strives to deliver information on new crop varieties, new farming practices and other products and services that arise from all GRDC research activities.

The GRDC also recognises that grain growers are very diverse in their communication and extension needs, and that information needs to be tailored to meet the specific needs of growers in different regions. Accordingly, the output group has established a series of GRDC Communication Catchments throughout the Australian grain belt that reflect industry demographics, farming systems and production attributes that are unique to each catchment. These allow specific pieces of information that are relevant to particular regions to be bundled together as information packages and delivered in a targeted way to specific segments of the GRDC’s large customer base.

The output group is also responsible for developing and implementing strategies to build research capacity in the agricultural disciplines of breeding and agronomy, as these are the two areas that most benefit the grains industry. Other important disciplines such as entomology are targeted as required. Capacity-building activities supported through this output group include PhD and post-doctoral research scholarships, grains industry training and research awards, short-term courses, conference sponsorships, and travel awards to allow individuals to attend national and international conferences. All of these activities assist in allowing the best use to be made of the latest research.

Investment strategies

Communication and customer services
Australian grain growers are the GRDC’s main target audience for the delivery of information on R&D outcomes. However, it is becoming increasingly important to build relationships with the growing network of intermediaries who can act as extension agents and thus help achieve faster adoption of GRDC research outcomes. This network includes agribusinesses, private consultants, farm advisers and grower groups who provide technical and strategic agronomic advice alongside traditional public sector providers. Opportunities to develop closer alliances between the GRDC and these organisations will be further explored in 2005-06, including with:

- individual growers through the improved delivery of packaged information;
- agribusinesses and advisers through the distribution of products and services and targeted adviser research updates; and
- State agencies and private organisations through the development and distribution of products and services.

This existing resource base is also well suited, and must be utilised more effectively, to test and promote the adoption of new varieties and practices at the regional level. This will add value to the GRDC’s total R&D investment by bringing together a range of complementary skills and resources in new combinations from the existing network to enhance technology transfer on farm.

Research Capacity
During 2005-06 the output group aims to develop and implement a new strategy to build critical mass in research capacity to support the grains industry. The steps involved include carrying out a review of existing research capacity, identifying what is needed to strengthen existing capacity, and developing and implementing a strategy to deliver what is needed.

An essential part of this work will be to gain a better understanding of why talented individuals are less inclined to pursue careers in agricultural disciplines and to identify the best means to address any disincentives. This is a prerequisite for being able to attract and retain talented students and researchers in agricultural disciplines.

Another key objective for 2005-06 is to encourage growers to take advantage of the travel and training programs to enhance learning, the sharing of experiences and communication between growers.
Enabling functions

The strategic planning review conducted by the GRDC in 2004 identified the corporate activities that equip the organisation and its individual output groups to deliver their agreed outcomes for stakeholders. Those ‘enabling functions’ are

- Business Strategy and Planning
- Information Management Systems
- Corporate Communication
- Risk Management
- Quality System
- Human Resources
- Finance and Administration
- Corporate Governance.

Figure 4 summarises the GRDC Value Chain, including the enabling functions and core business processes. These will be re-designed with a view to Best Operating Practice within 3 years.

These enabling functions provide essential support for all the corporation’s responsibilities under the Primary Industries and Energy Research Development Act 1989 (PIERD Act) and the Commonwealth Authorities and Companies Act 1997 (CAC Act).

The following sections set out the strategies and aims for each enabling function, both for 2005–06 and for the long term.

Figure 4: The Way Forward, GRDC Value Chain, including the enabling functions and core business processes.
### Business Strategy and Planning

**Objective**
To have a clearly defined and implemented business strategy that is owned by the Board, management, staff and panels; is fully aligned to industry needs; and is understood and supported by stakeholders.

**Long-term strategies**
- Maintain high-level support for the five-year plan *Driving Innovation* and ensure any revisions maintain *Driving Innovation’s* original intent.
- Present the strategic business plan to the Board, modify the plan as necessary, and implement agreed strategy whilst achieving full buy-in by the Board, management, staff and panels.
- Achieve full implementation of strategy, including stakeholder buy-in and support.
- Ongoing monitoring of progress relative to the strategic plan and an annual review of any need for change.

**Strategies for 2005–06**
- Ensure all reviews are completed and any changes impacting the strategic plan are fully incorporated.

**Expected outputs in 2005–06**
- Both *Driving Innovation* and *The Way Forward* maintain consistency.

**Expected outcomes in 2005–06**
- Strategic plan that remains current and relevant.
- Successful strategy implementation.

### Information Management Systems

**Objective**
To support R&D management and the business requirements of the organisation.

**Long-term strategies**
- Provide business systems that meet the requirements of the organisation.
- Provide maintenance and support for desktop computers and servers.
- Maintain the GRDC website.
- Facilitate the procurement of equipment.
- Develop and implement a project management system (PMS).
- Develop and implement a records management system (RMS).
- Develop and implement a knowledge management system for use by GRDC stakeholders as well as the GRDC itself.

**Strategies for 2005–06**
- Develop, implement and maintain an effective PMS.
- Develop, implement and maintain an effective RMS.
- Develop and complete an information technology business continuity plan (to guard against loss of information technology systems).

**Expected outputs in 2005–06**
- Demonstrated advancement of the corporation’s computerised systems.

**Expected outcomes in 2005–06**
- Efficient, effective and stable computerised systems that enable corporation staff to do their jobs effectively and efficiently by providing easy internal and external communications via reliable email facilities and internet-based mechanisms.
Corporate Communications

Objective
To inform all customers of the corporation’s goals, strategies and achievements

Long-term strategies
- Assist industry development by supplying current information on R&D activities and results
- Introduce effective external and efficient internal communication processes
- Increase the grains industry’s awareness of the GRDC’s activities, largely through integrated campaigns coordinated across all business units
- Create an effective feedback loop from customers to the GRDC, to measure effectiveness and improve performance

Strategies for 2005–06
- Further develop and improve corporate communications

Expected outputs in 2005–06
- All reporting requirements met on time and within budget
- Delivery of information demonstrated through informal and formal feedback

Expected outcomes in 2005–06
- Planning and reporting documents (annual report, annual operational plan and portfolio budget statements) published and submitted on time
- Timely and effective delivery of information products and services to GRDC customer segments

Risk Management

Objective
To ensure risks are identified, assessed and appropriately managed

Long-term strategies
- Manage risks at the project, business unit and strategic levels of the organisation
- Maintain an effective risk management system
- Continually monitor and update the risk management plan and the fraud control plan, to reflect changes in the operating environment
- Include risk management in performance measures for all staff

Strategies for 2005–06
- Continue to maintain an appropriate risk control environment
- Monitor strategic risk assessment actions to ensure implementation
- Ensure business risk action plans are in place and monitored at monthly Executive Management Team meetings

Expected outputs in 2005–06
- Board-approved fraud control and risk management plans for the corporation

Expected outcomes in 2005–06
- Agreed action plans implemented on time
- No fraud-related issues
Quality System

Objective
To be recognised as a quality-driven organisation, through quality leadership, continuous improvement and appropriate accreditation

Long-term strategies
- Maintain ISO 9001:2000 accreditation (which was renewed in 2004–05) with no major non-conformances and with any minor non-conformances closed out in agreed timeframes
- Demonstrate clear leadership on quality and the benefits to be derived from continuous improvement
- Raise business improvement forms for all areas of quality failure, including customer complaints and process failures

Strategies for 2005–06
- Further develop ownership of quality assurance procedures
- Promote quality assurance to ensure that it is effectively used for continuous business improvement

Expected outputs in 2005–06
- Satisfactory internal and independent audit reports in relation to the corporation’s ISO 9001:2000 quality accreditation system demonstrating compliance with the Australian standard

Expected outcomes in 2005–06
- An efficient and effective certified quality system that is embraced by staff as the way the GRDC carries out the administration of its business to ensure a standard of product and service which meets customer and stakeholder needs

Human Resources Management

Objective
To have best practice in human resources (HR) management clearly focused on delivering business objectives

Long-term strategies
- Review the GRDC organisational structure in view of portfolio analysis
- Ensure GRDC positions are correctly graded and remunerated
- Introduce competency-based performance appraisals
- Ensure all staff have clearly defined management objectives, critical success factors and performance indicators
- Ensure reward systems are clearly linked to management objectives, critical success factors and key performance indicators
- Conduct training skills needs analysis
- Introduce a formal succession planning process
- Achieve a performance-driven and customer-focused culture
- Conduct a review of the use of consultants

Strategies for 2005–06
- Continue to ensure the successful implementation of the critical success factors and performance indicators
- Continue to develop and achieve a focused, motivated and performance-driven culture

Expected outputs in 2005–06
- Staff fully trained in organisational competencies
- Compensation programs fully aligned to performance

Expected outcomes in 2005–06
- Competent and well-trained staff contributing to the achievement of the corporation’s objectives
Finance and Administration

Objective
To have accounting and investment functions managed in accordance with board and statutory requirements

Long-term strategies
- Maintain a monitoring system through the Finance and Audit Committee and Internal Audit Program
- Develop a budget and reporting framework to foster financial responsibility at the business unit level
- Ensure that the corporation is able to meet the funding requirements of the annual operational plan

Strategies for 2005–06
- Ensure effective financial management
- Introduce improved financial management reports
- Introduce improved formats for budgets and variance analyses
- Encourage staff involvement leading to greater awareness of budget setting, compliance and variance analysis

Expected outputs in 2005–06
- Demonstrated expenses less than or equal to budget
- Implementation of variance analysis reporting and corrective actions

Expected outcomes in 2005–06
- Full compliance, including a 2005–06 administration budget finalised and controlled within budget
- A new structure implemented within existing budgets
- Effective management of costs and variance analysis

Corporate Governance

Objective
To have a robust system of governance

Long-term strategies
- Develop a business reporting and responsibility framework to enhance organisational performance
- Meet statutory requirements in relation to annual operational plans, annual reports and investment plans
- Ensure the operating manual reflects the requirements of the Board and the Executive Management Team and is understood and implemented by appropriate staff
- Manage compliance through appropriate control systems and an ethical business culture

Strategies for 2005–06
- Continue to ensure compliance with reporting requirements under the PIERD Act and the CAC Act
- Promote and update the board-approved GRDC Operating Manual

Expected outputs in 2005–06
- Further implementation of the board-approved GRDC Operating Manual
- Board members and all staff trained in relevant procedures
- New policies introduced as required

Expected outcomes in 2005–06
- Competent and well-trained board members and staff contributing to better operating practice
Estimates of income

Figure 5 shows the break up of the GRDC’s forecasted income for 2005–06. Australian Government contributions for 2005–06 are expected to be $43.10 million.

Levy contributions in 2005–06 are predicted to be $52.40 million. Figure 6 shows the sources of GRDC’s levy income in percentage terms, by leviable crop. GRDC’s other income is predicted to be $10.00 million in 2005-06, which includes interest on investments and royalties.

The levy revenue in 2005–06 is based on several assumptions. These assumptions include:

- wheat production to be 22.60 million tons
- the average price of Australian Premium White (APW) wheat to be $180.00 per ton free on board (FOB)
- the gross value of grains production to be $7.30 billion
- 2004–05 levy rates to continue in 2005–06.

Estimates of expenditure

The GRDC Board has approved the maintenance of annual expenditure of $128.00 million (based on 2004–05 real dollars). This implies that annual expenditure will be $131.50 million (based on dollars of the day) in 2005–06, increasing at 3% per annum thereafter. The Board has adhered to this position for the following reasons:

- Over many years, industry forecasters have consistently underestimated the growth and robustness of the grains industry. This has resulted in a history of excessively pessimistic reserve forecasts, consequent conservatism in expenditure, and failure to bring the reserves into the prudential range.
- There is ‘upside’ potential, not only in terms of production, but also in terms of exchange rate and price.

Table 2 summarises the GRDC’s estimates of expenditure for 2005–06. These figures are indicative only. Changes in the GRDC’s operating environment may require the corporation to vary the total expenditure or specific allocations to secure its objectives.
Figure 7 shows the percentile break-up for the proposed expenditure in 2005–06. The total forecast expenditure on new investments for 2005–06 is $24.70 million.

**Figure 7: Break-up of the proposed $131.50 million expenditure for 2005–06**

<table>
<thead>
<tr>
<th>R&amp;D investments</th>
<th>2005–06</th>
<th>2005–06</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Varieties</td>
<td>59.60</td>
<td>45.4</td>
</tr>
<tr>
<td>2 Practices</td>
<td>34.20</td>
<td>26.0</td>
</tr>
<tr>
<td>3 New Products</td>
<td>11.00</td>
<td>8.3</td>
</tr>
<tr>
<td>4 Communication and Customer Services</td>
<td>9.70</td>
<td>7.4</td>
</tr>
<tr>
<td>Strategic investments</td>
<td>4.00</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**Management**

| Employees | 5.50 | 4.2 |
| Suppliers | 7.50 | 5.7 |
| Total     | 131.50 | 100.0% |

1 ‘Strategic investments’ includes $2 million for ‘Emerging issues’.
2 ‘Suppliers’ includes depreciation and amortisation.

The GRDC looked at the following two key income scenarios for 2005–06:

**Scenario 1** is the baseline case, which is based on the Australian Bureau of Agriculture and Resource Economics (ABARE)’s current 2005–06 grains production forecasts and AWB Ltd’s estimated APW wheat’s price. The APW price is lower than the price currently estimated by ABARE. The baseline scenario demonstrates that GRDC’s gross reserves would be $60.60 million in 2005–06, below the lower prudential limit of the reserves policy, which is $67.70 million.

**Scenario 2** projects an optimistic price forecast for APW wheat, as projected by ABARE. The optimistic scenario also forecasts a higher price for barley, and higher production for both wheat and barley. Scenario 2 shows that the projected income in 2005–06 would be $116.10 million, which is about 12% higher than the baseline. The optimistic scenario demonstrates that GRDC’s gross reserves would be $72.70 million in 2005–06, above the lower prudential limit of the reserves policy.

The GRDC’s proposed payment to the GCA for its participation in consultations with the corporation during 2005–06 is $210,120.00. These funds will be used to meet the GCA’s costs in preparing for and attending consultative meetings with the GRDC to assess the GRDC’s performance against the industry’s expectations.

The GRDC will also continue to invest in the project National Partners in Grain, in which the GCA acts as the lead agency. The proposed investment for 2005–06 is $190,000.00. This project will provide a nationally coordinated, strategic approach towards increasing the technical knowledge and skills of women and young people in the grains industry.

The GRDC will also continue to provide financial support for the Grains Week Conference coordinated by the GCA.
List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABARE</td>
<td>Australian Bureau of Agriculture and Resource Economics</td>
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<td>APW</td>
<td>Australian Premium White</td>
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<tr>
<td>CAC Act</td>
<td>Commonwealth Authorities and Companies Act 1997</td>
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<td>CIMMYT</td>
<td>International Maize and Wheat Improvement Centre</td>
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<td>CRC</td>
<td>Cooperative Research Centre</td>
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<tr>
<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organisation</td>
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<tr>
<td>GCA</td>
<td>Grains Council of Australia</td>
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<td>GRDC</td>
<td>Grains Research and Development Corporation</td>
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<tr>
<td>ICARDA</td>
<td>International Centre for Agricultural Research in the Dry Areas</td>
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<td>IPM</td>
<td>integrated pest management</td>
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<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<td>MIR</td>
<td>mid-infrared</td>
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<tr>
<td>NIR</td>
<td>near-infrared</td>
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<tr>
<td>PIERD Act</td>
<td>Primary Industries and Energy Research and Development Act 1989</td>
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<td>PMS</td>
<td>project management system</td>
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<tr>
<td>R&amp;D</td>
<td>research and development</td>
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<tr>
<td>RMS</td>
<td>records management system</td>
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</table>
Key Contacts

Chairman—Mr Terry J Enright

Managing Director—Mr Peter Reading

Executive Managers:

- Varieties—Mr John Harvey
- Practices—Mr Greg Fraser
- New Products—Mr Vince Logan
- Communication and Customer Services—Mr Victor Dobos
- Corporate Strategy and Program Support—Mr Morris Lloyd
- Corporate Services—Mr Gavin Whiteley