Australian Government

Sugar Research and Development Corporation

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Annual Operational Plan 2006 → 2007

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1. Introduction

The Sugar Research and Development Corporation (SRDC) is a statutory authority established under the *Primary Industries and Energy Research and Development Act 1989* (the PIERD Act). SRDC's mission is to foster an innovative and sustainable Australian sugar industry through targeted investment in research and development.

SRDC focuses on producing outcomes to benefit the Australian sugar industry and the community. It does not conduct research itself but invests in, and manages, a broad spectrum of research by various research partners, with the goal of maximising stakeholder returns on R&D investment.

It is the intention of the Australian Government that R&D Corporations should provide leadership and be catalysts for change. They should identify needs and opportunities for R&D, including improvements in the adoption of research results, and exploit opportunities to expand the funding and impact of research.

SRDC obtains income from levies paid by the sugar industry, matching funds from the Australian Government, and interest. The levy is set by the Minister on the advice of SRDC's Representative Bodies, and in 2006–07 is expected to remain at $0.14 per tonne of sugarcane harvested, divided equally between growers and millers.

Section 25 of the PIERD Act requires SRDC to develop and prepare a written Annual Operational Plan (AOP). The AOP is required to set out the broad groupings of eligible activities that the Corporation proposes to fund in the year ahead. The AOP must also describe the extent to which these activities address the Corporation's current Research and Development Plan. This document is the SRDC AOP for 2006–07.

In addition, the Annual Operational Plan should incorporate an outcome/output framework to facilitate performance reporting required by the *Commonwealth Authorities and Companies Act 1997*.

SRDC's outcomes and outputs reflect the priorities of industry and government. The outputs of value chain integration, sustainable farming systems, sustainable processing and distribution systems, and building human capacity for change, all contribute to the outcome of a profitable and internationally competitive Australian sugar industry providing economic, environmental and social benefits for rural and regional communities.

SRDC R&D Plan 2003–2008

This Annual Operational Plan is the fourth to be submitted based on the SRDC R&D Plan 2003–2008.

SRDC worked with sugar industry organisations, research partners and government in developing the R&D Plan 2003–2008, which was approved by the Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry on 20 December 2002.

The R&D Plan 2003–2008 was framed within the context of the realities of the state of the industry, while continuing to look to the health and sustainability of the industry in the longer term.

The R&D Plan 2003–2008 gives particular attention to three broad areas — use of an integrated systems approach, improved uptake of existing R&D outputs by the industry, and capacity building to more fully realise the potential of people and partnerships throughout the industry.

The R&D Plan sets out SRDC's Corporate Outcome of *A profitable and internationally competitive Australian sugar industry providing economic, environmental and social benefits for rural and regional communities.*

The R&D Plan also nominates six Key Outcomes that will be delivered during the period of the Plan to contribute to the Corporate Outcome. These are listed in Section 5.1 of this AOP.

The focus of the Plan is systems-based in order to realise the opportunities available from a holistic approach to the industry value chain. Activities developed under the Plan will use novel, multi-disciplinary tools and technologies that integrate across the value chain at mill area and regional levels. They will develop human capacity and associated processes in order to implement more rapid and more radical change across the system as a whole.

The SRDC Board reviews the continuing relevance of the R&D Plan at its July meeting every year, taking into account industry views. In April and May 2005, SRDC conducted Regional Workshops in all regions of the industry. A large majority of participants indicated that the six Key Outcomes of the R&D Plan were appropriate to achieve an innovative and sustainable Australian sugar industry. In July 2005, the Board endorsed the continuing relevance of the R&D Plan, and based the call for projects for 2006–07 on the Outcomes and Programs of the Plan.

2. Corporate Governance

2.1 Enabling Legislation and Legislative Objectives

SRDC was established under the *Primary Industries and Energy Research and Development Act 1989* (the PIERD Act) on 1 October 1990. As an Australian Government Statutory Authority it is also subject to the *Commonwealth Authorities and Companies Act 1997* (the CAC Act).

The objects of the PIERD Act are to make provision for the funding and administration of research and development relating to primary industries with a view to:

(a) increasing the economic, environmental or social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries; and

(b) achieving the sustainable use and sustainable management of natural resources; and

(c) making more effective use of the resources and skills available in the community in general, and in the scientific community in particular; and

(d) improving accountability for expenditure upon research and development activities in relation to primary industries.

2.2 Objectives of SRDC

The objectives of SRDC are directly related to the objects of the PIERD Act. They are to:

- improve the competitive position and cost efficiency of the Australian sugar industry;
- achieve sustainable use and sustainable management of the natural resource base of the sugar industry;
- apply industry, scientific and community resources more effectively to R&D in the sugar industry; and
- manage SRDC resources efficiently and to improve the accountability for expenditure on R&D for the sugar industry.

2.3 Responsible Minister

SRDC is responsible to the Australian Parliament through the Hon. Sussan Ley MP, Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry. The Parliamentary Secretary:

- Approves the five-year Research and Development Plan and the Annual Operational Plan
- Appoints Directors of SRDC on the recommendation of the Sugar Research and Development Corporation Selection Committee
- Appoints the Chairperson and Government Director of SRDC.

The Chair and Executive Director meet formally with the Parliamentary Secretary at least twice annually, to provide direct reporting on significant issues and decisions including the industry outlook and SRDC's R&D portfolio. The Chair writes to the Parliamentary Secretary after every in-person Board meeting. In July each year, the Board reviews the continuing relevance of the SRDC R&D Plan, and advises the Parliamentary Secretary of the outcome of that review.

2.4 Industry Representative Organisations

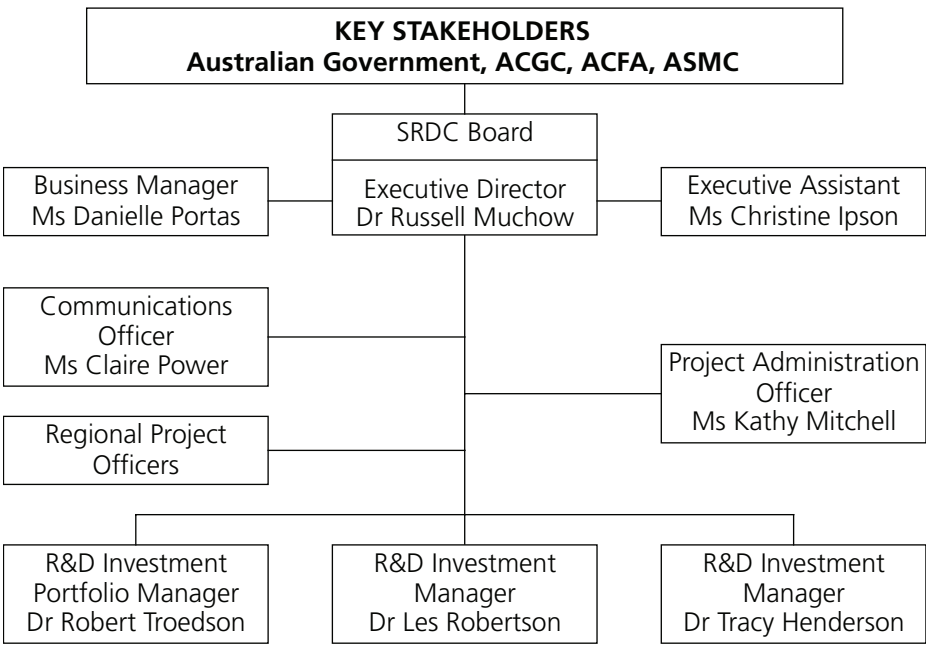
The PIERD Act prescribes the following representative organisations of SRDC:

- Australian Cane Growers' Council Limited (ACGC)
- Australian Cane Farmers' Association Limited (ACFA)
- Australian Sugar Milling Council Proprietary Limited (ASMC)

SRDC is accountable to both the Australian Government and these representative organisations. SRDC meets formally with the representative organisations at least three times each year to discuss SRDC activities, statutory reporting, levy arrangements, R&D priorities and any other matters of mutual interest. No payments are to be made to the representative organisations in 2006–07 in relation to these consultations or for any other purpose (see also Section 4.6).

2.5 Corporate Governance Framework

2.5.1 Corporate Structure



2.5.2 Structures, processes, and controls

The SRDC Board sets the Corporation's strategic direction and delegates responsibility for day to day management to the Executive Director. The Board is committed to governance systems that enhance performance and ensure that SRDC is operating according to accountability provisions of the PIERD Act and the CAC Act. An Audit Committee of three non-executive directors appointed by the Board provides advice to the Board to assist it in fulfilling its responsibilities relating to accounting, reporting and compliance practices of the Corporation.

SRDC's Corporate Governance Framework is outlined on the following pages. It was adopted in its present form in March 2004, and confirmed by the current Board in June 2005 and March 2006.

SRDC Corporate Governance Framework

Leadership

SRDC operates under the direction of a Board. The role of the Board is to approve overall strategy, budgets and large financial decisions. The Executive Director leads the SRDC management team and is accountable to the Board for day to day operation of the Corporation. The Board has two committees — an Audit Committee to provide advice on accounting, financial reporting, compliance practices and risk management, and a Scholarship Committee which provides advice to the Board on policies relating to scholarships and the awarding of scholarships.

The key Board functions are:

- establishing goals, setting strategic direction, approving the annual budget and approving large items of expenditure.
- developing and approving a five year R&D Plan, an Annual Operational Plan and producing an Annual Report.
- establishing and approving policies for the operation of SRDC.
- ensuring that risk assessment and management frameworks are in place to minimise business and financial risk.
- ensuring that R&D resources are allocated to address priority issues effectively.
- ensuring compliance with applicable laws and provisions of the CAC Act.
- ensuring that Directors and staff maintain the highest ethical standards in accordance with the Code of Conduct.
- appointing, appraising, and setting the level of remuneration for the Executive Director.
- evaluating its own performance and that of its committees and SRDC management against agreed indicators.

Planning and Reporting

The five year R&D Plan defines SRDC's core business, indicates broad priorities for R&D and defines the corporate strategy to achieve its outputs and outcome.

The Annual Operational Plan (AOP) specifies the broad groupings of R&D activities that SRDC proposes to fund during the financial year together with an estimate of income and expenditure. The AOP must be submitted to the responsible Minister for approval and a copy forwarded to each of SRDC's Representative Bodies.

The SRDC Portfolio Budget Statement summarises SRDC's outcome, outputs, performance information and financial position each year. It is consistent with the five year R&D Plan and the AOP and is tabled in Parliament.

The SRDC Annual Report gives particulars of R&D activities funded during the year (inputs), and a review of how SRDC has performed in relation to the objects of the PIERD Act, the SRDC R&D Plan and its corporate outputs and outcome. The Annual Report must be submitted to the responsible Minister for tabling in Parliament and provided to each of SRDC's Representative Bodies.

Accountability

As required by Sections 15 and 16 of the CAC Act, the Chair of SRDC advises the responsible Minister in writing of significant events affecting the operation of the Corporation, and the general operations of the Corporation. It is SRDC policy for the Chair and Executive Director to also consult personally with the Minister twice yearly, and to write to the Minister after each in-person Board meeting outlining key decisions taken.

The Chair and Executive Director meet three times each year, in March, July and November, with the Executive of SRDC's three Representative Bodies to discuss SRDC's Annual Operational Plan and Annual Report and investment needs and priorities.

Management

The SRDC Business Process Management System (BPMS) folds active quality assurance into the daily management of SRDC. It is an essential tool in managing risk and controlling fraud and its annual audit is overseen by the Audit Committee.

Financial Control

SRDC maintains accounts and records of transactions in accordance with accepted accounting principles. Financial statements are prepared in accordance with Schedule 1 of the CAC Act and Australian Accounting Standards.

Risk Management

SRDC's risk management system is detailed in its Risk Management, Fraud Control and Business Continuity Plans. These cover all of SRDC's activities from portfolio to project level including transactions with external providers and contractors.

Monitoring

The SRDC R&D Plan 2003–2008 outlines strategies and performance measures that provide a framework for monitoring activities and measuring corporate performance. At the operational level, the BPMS details processes for monitoring and assessment of SRDC's R&D activities and management performance.

The SRDC Board reviews R&D activities and management systems at its July meeting each year. It conducts a strategic analysis of the investment portfolio, reviews progress towards achieving its corporate outcome and outputs, and considers whether the R&D Plan requires amendment. It also reviews the performance of both the Board and management of SRDC, and considers any changes necessary to policies and operating

procedures, financial reporting, reporting systems and internal controls. These are detailed in the Business Process Management System (BPMS) which incorporates SRDC's quality and continuous improvement mechanism. An internal audit of the BPMS is conducted annually and reported to the Audit Committee and the Board.

During 2004–05 the Board instituted changes in SRDC's project application and assessment processes, to expand the types of projects available and improve the quality of proposals. SRDC invests in four types of projects:

- Research Projects, with Expressions of Interest to be submitted by 15 September, and proponents of selected proposals requested to develop a Full Research Project Proposal in consultation with SRDC, for final submission by the following 21 February, and projects to commence from 1 July.

- Scholarship Projects, for postgraduate study, with applications to be submitted by 15 September for projects to commence from the following 1 January.

- Travel and Learning Opportunity Projects (TLOP), to be submitted by 15 September and 21 April, for activities to be conducted in the following calendar and financial years, respectively.

- Grower Group Innovation Projects (GGIP), to be conducted by grower groups, to be submitted by 21 April for projects to commence from 1 July.

In July 2005, SRDC called for Research Project Expressions of Interest (RPEOIs) in Programs B, C and D of the R&D Plan, for projects to commence from July 2006, as well as Scholarship Projects and TLOPs to commence from January 2006. Following a Value Chain Workshop in October 2005, SRDC called for RPEOIs in Program A of the R&D Plan, to commence from July 2006. In February 2006, SRDC called for GGIPs and TLOPs to commence from July 2006.

Across the four Programs, 88 RPEOIs were received, and 31 Full Proposals were invited. A further eight proposals were invited for commencement in 2005–06. Twelve new TLOPs and four scholarships were awarded from January 2006.

In March 2006, SRDC convened two Working Parties to consider the Research proposals, and provide an assessment to the Board of their attractiveness and feasibility. Members of the Working Parties were drawn from industry, research, marketing and government sectors as well as SRDC Directors and Investment Managers.

Following consideration of the Research proposals by the Working Parties and the Board in March 2006, the portfolio of projects (including continuing projects commenced prior to 2006–07) was consolidated by SRDC for submission in this Annual Operational Plan. GGIPs and TLOPs from the April 2006 call had not been finalised at the date of submission, but budget allocations are indicated in Section 5.3.

3. Operating Environment

3.1 Industry and R&D Environment

The Australian sugar industry produces raw and refined sugar from sugarcane. Income is also derived from by-products including ethanol and molasses, and from generation of electricity. While on average Australia produces only 3–4% of the world sugar supply, it exports approximately 8–10% of the sugar traded worldwide. In recent years, Australian sugar production has been between 4 and 5 million tonnes per annum, depending on seasonal conditions. International sugar prices have increased in 2005–06 after several years of relatively low prices. The gross value of cane production is forecast to increase from $873m in 2004–05 to just over $1 billion in 2005–06.

Total funds available for sugar industry R&D in 2005–06 were estimated in October 2005 to be $50.3 million, of which 37% was contributed by the industry. This total consisted of $11.3 million provided by SRDC, $23.8 million from R&D providers including CSIRO, Universities (including SRI@QUT), BSES Ltd and Productivity Services companies, and $15.1 million from other sources including the CRC for Sugar Industry Innovation through Biotechnology. These levels of funding are similar to those in recent years.

The SRDC R&D Plan 2003–2008 outlines four key challenges that the sugar industry and SRDC in particular are expected to face over the period of the Plan, as follows:

- *Competition and the forces of globalisation*

  While Australia is technologically a very efficient sugar producer, competitors have achieved gains in cost efficiency and total revenue by integrating operations across the value chain and creating more value-added opportunities. In addition, Australia is one of the few major sugar exporters which do not have a substantial domestic market for a large proportion of their production. Brazil, in particular, has increased its exports more than ten-fold over the past six years to more than 19 million tonnes (compared with Australia's exports of around 4 million tonnes) and with its low production costs, provides a new benchmark for all countries competing on the international sugar market. Production is also increasing in Asia, but keeping pace with consumption growth.

- *Availability of new technologies*

  Advances in areas such as Information Technology and Biotechnology may provide the platform for the substantial improvements in profitability required to sustain the industry and ensure its long-term survival. Biotechnology programs are underway in several countries including Brazil, South Africa and the USA, but market pressures are such that no GM cane varieties have been released for commercial production anywhere.

- *Pressure for environmental sustainability*

  Pressure originates from a diversity of sources including world markets, Australian and other national governments, the industry itself, other industries affected by the sugar industry (eg. tourism, fishing) and from the wider community.

- *Expectations of society*

  The sugar industry's neighbouring communities are changing with increasing urbanisation along the east coast, resulting in an expectation of greater social responsibility from the industry in areas such as road safety and public amenity.

The Australian sugar industry and its R&D community continue to face the need for change in responding to international competition and other challenges. In responding to this challenge, SRDC and R&D partners need to address the economic, environmental and social dimensions of sustainability to secure the industry's future.

3.2 Stakeholders

The stakeholders of SRDC include the growers and millers of the Australian sugar industry, the Australian Government, R&D organisations, agribusiness and the rural and regional communities in sugar-growing areas.

In developing its R&D Plan 2003–2008, SRDC consulted its stakeholders to develop the needs and opportunities for R&D during the five years ahead. It took into account:

- Industry priority issues
- Views of R&D Organisations and Agribusiness
- Australian Government Priorities
- Community issues

In the process of developing the R&D Plan, SRDC conducted a series of needs analysis workshops followed by a Delphi process to determine the priority needs of the industry. Further workshops were then conducted in all regions of the industry to seek feedback on the draft priorities, strategies and programs of the Plan. The National and Rural R&D Priorities of the Australian Government are also reflected in the Plan, and details of how SRDC's portfolio addresses those priorities are outlined in Section 5.

Industry stakeholders determined that the industry's principal priorities or needs are:

- Whole-of-industry profitability through exploitation of opportunities for better integration across the value chain to ensure enhanced revenue and increased cost efficiency.

- An economically, environmentally, and socially sustainable industry that has sustainable farming, harvesting, processing, and distribution systems, and efficient and effective marketing systems for Australian sugar.
- An efficient and effective Research, Development, and Extension capacity that collaborates strongly across R&D providers and with the various components of the industry value chain.
- Attraction and retention of people who are talented, well trained and committed to the sugar industry.

These are reflected in the six Key Outcomes of the R&D Plan which are discussed in detail in Section 5. Sugar industry stakeholders at SRDC's regional workshops in April 2005 strongly endorsed the continuing relevance of the priorities and target outcomes of the SRDC R&D Plan.

In March 2006, the SRDC Board approved a consultation process for the development of the next SRDC R&D Plan 2007–2012, to be conducted during 2006–07. The Board anticipates that the new R&D Plan will be submitted to the Parliamentary Secretary for approval in July 2007.

4. Outcomes, Outputs and Resourcing

4.1 SRDC Outcome

The SRDC Outcome was updated for SRDC R&D Plan 2003–2008 to more explicitly reflect the economic, environmental and social benefits from SRDC funded research and development.

SRDC's outcome is:

A profitable and internationally competitive Australian sugar industry providing economic, environmental and social benefits for rural and regional communities

This outcome is consistent with the Agriculture, Fisheries and Forestry portfolio outcome of more sustainable, competitive and profitable Australian agriculture, food, fisheries and forestry industries.

The R&D Plan 2003–2008 specifies six key outcomes which together contribute to the Corporate Outcome. The six key outcomes and SRDC's investments to achieve them are described in Section 5.

4.2 SRDC Outputs

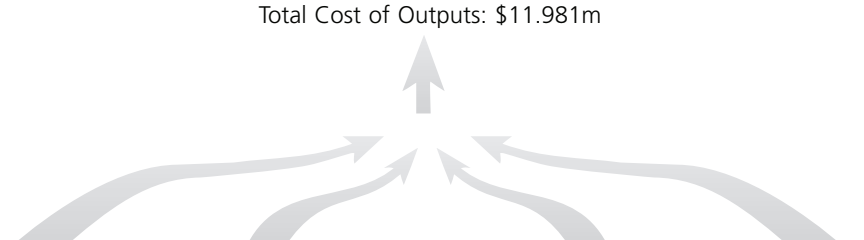
The R&D Plan 2003–2008 specifies four outputs which relate to the four Programs of the Plan. Figure 1 shows the contribution of the four outputs to SRDC's overall outcome in 2006–07.

Figure 1 — Relationship between Outcomes, Outputs and Inputs in 2006–07

Sugar Research and Development Corporation
Chair: Mr Robert Granger
Executive Director: Dr Russell Muchow

Outcome
A profitable and internationally competitive Australian sugar industry providing economic, environmental and social benefits for rural and regional communities.

Total Revenue: $11.304m
Total Cost of Outputs: $11.981m



Output 1: (Program A)	Output 2: (Program B)	Output 3: (Program C)	Output 4: (Program D)
Whole-of-system solutions based on integrated management of the value chain, particularly at mill area and regional levels.	*Sustainable sugarcane production systems based on integrated management of resources at farm level.*	*Flexible, cost-effective systems for sustainable harvest, transport, milling and marketing based on innovative design.*	*Enhanced human capacity for change, learning and innovation in the sugar industry.*
Total Cost: $1.917m	**Total Cost: $5.991m**	**Total Cost: $1.796m**	**Total Cost: $2.277m**

4.3 Outcome — Resourcing

The total revenue for SRDC, including industry levies and the Australian Government contribution, and total expenditure for the SRDC outcome for 2006–07, are shown in Table 1 and compared with the approved budget for 2005–06.

Cash holdings are forecast to decline in 2006–07 due to increased project activity to spend surpluses accumulated in prior years. However, cash at the end of 2006–07 year will remain above $6 million, and above the Corporation's target of 50% of the following year's forecast expenditure.

TABLE 1 SRDC BUDGETS 2005–06 AND 2006–07

	2005–06	**2006–07**
Estimated Crop Size (cane)	37.5 mt	38.24 mt
Levy rate/tonne	$0.14	$0.14
INCOME	**$m**	**$m**
Industry Contribution	5.252	5.356
Australian Government PIERD Act Contribution	4.390	5.356
Australian Government FMS Contribution	0.529	0.142
Interest / Other	0.370	0.450
TOTAL INCOME	**10.541**	**11.304**
EXPENDITURE		
Continuing Projects	6.157	5.916
New Projects	3.605	4.266
TOTAL PROJECTS	**9.761**	**10.182**
Operation of SRDC	1.704	1.799
TOTAL EXPENDITURE	**11.465**	**11.981**

4.4 Allocation of Resources among Outputs

The R&D Plan 2003–2008 provides a target allocation of resources between Programs. Table 2 compares the proposed allocation for 2006–07 to the target allocation. The proposed allocations in Programs B and C are within the target ranges, while those for Programs A and D are below and above, respectively, the target ranges. The targets for Programs A and D were both increased in this R&D Plan relative to the previous Plan. SRDC is promoting greater interest in these two Programs, and expects the allocation to Program A to increase in future years. However the Board has determined to maintain rigorous project selection procedures, and to accept the below-target allocation in Program A in 2006–07, rather than approving additional projects that do not meet SRDC's high standards.

TABLE 2 TARGET AND PROPOSED ALLOCATION OF RESOURCES ACROSS PROGRAMS AND INDICATIVE NUMBERS OF CONTINUING AND NEW PROJECTS, FOR 2006–07

	Program (Output)				
	A (1): Value Chain Integration	**B (2): Farming Systems**	**C (3): Processing and Distribution Systems**	**D (4): Industry Capacity**	**Total**
Target Allocation in R&D Plan (%)	20–25	45–50	15–20	10–15	
Total Funding 2006–07 ($m)	1.917	5.991	1.796	2.277	11.981
Allocation 2006–07 (%)	16	50	15	19	100
Project Numbers:					
Continuing	13	26	13	32	84
New	7	7	5	1	20
Scholarships	–	–	–	12	12
Total	**20**	**33**	**18**	**45**	**116**

4.5 Performance Information

SRDC's performance indicators and measures are indicated in Table 3.

TABLE 3 PERFORMANCE INFORMATION

Effectiveness — Overall achievement of the Outcome and Outputs	
Indicator	**Measure**
1. Economic returns from SRDC investments in excess of a benefit:cost ratio of 5:1	1(a) Investment analyses of completed R&D and resultant benefits 1(b) Benchmark adoption rates for at least three technologies per year
2. Environmental returns from: • better understanding and managing natural resources • reducing adverse impacts on the production environment and other ecosystems	2. Case studies demonstrating better natural resource management and reduced environmental impacts in quantitative and/or qualitative terms

3. Societal returns from investment in: • industry and public health and safety • human resource capacity and capability • R&D with significant community benefits	3(a) Case studies demonstrating improved OH&S 3(b) At least two tertiary scholarships completed each year and two industry R&D personnel completing study tours or conference attendance 3(c) Number of producers involved in participative action research increasing each year. 3(d) Proportion of R&D funding contributing benefits beyond the sugar industry exceeds 30% of the R&D budget. 3(e) Number of R&D projects contributing significant benefits to rural and regional communities

4.6 Overview of Programs

The R&D Plan 2003–2008 includes four R&D Programs which are described below. Details of R&D activities in the four Programs are provided in Section 5, which describes their relationship to the six Key Outcomes of the R&D Plan and to the National and Rural R&D Priorities of the Australian Government. Attachment A provides a listing of continuing and new projects or project groups that were approved at the time of preparation of this AOP. Additional projects, within the budget amounts proposed in this Section, may be approved subsequently.

Program A Value Chain Integration

This Program is concerned with adding value by making the value chain work better. Significant opportunities exist to optimise the use of whole-of-system resources by exploiting linkages and inter-dependencies across the industry value chain. Optimum solutions need to underpin not only the economic viability of the industry but also its environmental and social sustainability. Particular emphasis will be placed on a whole–of-system approach to harvest and transport, leading to enhanced revenue and cost efficiency.

Outcome

Increased efficiency and overall profitability of the industry as an integral part of sustainable regional development.

Output

Whole-of-system solutions based on integrated management of the value chain, particularly at mill area and regional levels.

Activities in 2006–07

Projects conducted in Program A will contribute to the achievement of Key Outcomes 2 and 5, and will be described in Section 5.

Program B Farming Systems

Sugarcane productivity is essential for the viability of growing, harvest, transport and milling enterprises. Significant opportunities exist to seek improvement based on skilful management of resources (eg. varieties, soil, water, nutrients, pest management inputs, capital and labour) given the variable influences of climate, pest and disease incursion and incidence, repair of soil degradation, cost/price structures and social structures. A systems approach to farming and the development of novel pathways for implementation of more sustainable practices based on participative action research will be vital to achieving profitable, safe and environmentally responsible farming practices.

Outcome

Robust production systems that are both profitable and in harmony with the environment and societal expectations.

Output

Sustainable sugarcane production systems based on integrated management of resources at farm level.

Activities in 2006–07

Projects conducted in Program B will contribute to the achievement of Key Outcomes 1 and 3, and will be described in Section 5.

Program C Processing and Distribution Systems

Technological advance is critical for more efficient processing and distribution systems, but implementation of advanced technologies is conditional on better utilisation of capital and the development of innovative products.

Opportunities exist to improve the design and implementation of harvest, transport, milling and marketing processes consistent with environmental and societal responsibility. These will lead to better utilisation of capital, greater cost efficiency, enhanced product recovery, expanded product range and enhanced product quality.

New opportunities in diversification to broaden the income stream warrant investment commensurate with risk. Investment should be targeted at expanding the product range and exploring opportunities for extraction of novel biomaterials from modified sugarcane varieties.

Outcome

More productive and cost-effective processing and distribution systems in harmony with the environment and societal expectations.

Output

Flexible, cost-effective systems for sustainable harvest, transport, milling and marketing based on innovative design.

Activities in 2006–07

Projects conducted in Program C will contribute to the achievement of Key Outcomes 2 and 4, and will be described in Section 5.

Program D Industry Capacity

This program is concerned with adding value through more fully realising the potential of people throughout the industry. To realise the opportunities arising from innovative R&D, it is important to enhance human skills to address the challenges of the increasingly complex operating environment of the Australian sugar industry. Investing in people and fostering alliances, partnerships and collaborations will be critical to success in integrating system solutions that contribute to a vibrant sugar industry.

Outcome

A skilled human resource base and enhanced industry R&D capacity focussed on delivery of economic, environmental and societal benefits.

Output

Enhanced human capacity for change, learning and innovation in the sugar industry.

Activities in 2006–07

Projects conducted in Program D will contribute to the achievement of Key Outcomes 5 and 6, and will be described in Section 5.

4.7 Projects or Consultancies undertaken by Representative Bodies

The *1998 Consultation Guidelines* require that Annual Operational Plans outline the details of the overall nature, purpose and expected outcome of projects or consultancies undertaken by representative industry organisations.

Previous Annual Operational Plans have listed projects undertaken by regional grower representative organisations. Both the regional and central bodies are separate entities from the Australian Cane Growers' Council, and projects administered by them are not undertaken by the representative body.

No R&D projects will be undertaken by SRDC's Representative Bodies in 2006–07, and SRDC will make no other payments to these organisations.

5. Addressing Targeted Outcomes and Stakeholder Priorities in the SRDC R&D Portfolio

5.1 Six Key Outcomes of the SRDC R&D Plan 2003–2008

The R&D Plan 2003–2008 aims to deliver six Key Outcomes through partnerships between SRDC and its stakeholders. They are:

- An *increasing and more reliable cane supply*, primarily through the implementation of robust farming systems that enhance economic and environmental performance, and are less vulnerable to the impacts of adverse factors such as disease and climate variability;
- *Facilitation of change* which promotes adoption of whole-of-system solutions to *enhance revenue and cost efficiency across the value chain* at mill area and regional levels;
- *Demonstration of environmental sustainability* to the satisfaction of all stakeholders;
- *Diversification of the income stream* from products derived from sugarcane;
- *Enhancement of human capacity and partnerships* between industry, research and regional communities to underpin change, learning and innovation; and
- An *effective R&D capability* underpinning industry futures.

5.2 Australian Government R&D Priorities

The Prime Minister launched the National Research Priorities on 5 December 2002 under four broad headings:

- An environmentally sustainable Australia;
- Promoting and maintaining good health;
- Frontier technologies for building and transforming Australian industries; and
- Safeguarding Australia.

The Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry advised the Government's new priorities for rural research and development on 19 March 2003. The Rural R&D Priorities are framed within the National Research Priorities but give a focus on issues relevant to rural industries. They 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;
- Creating an innovative culture; and
- Protecting Australia from invasive diseases and pests.

5.3 Addressing the R&D Plan Outcomes and the Government R&D Priorities

This section outlines SRDC's planned investment activities in 2006–07. The six Key Outcomes of the SRDC R&D Plan fall into three groups, each with two related outcomes. They provide the framework for an integrated description of how the investments address both the six Key Outcomes and the Australian Government's National and Rural R&D priorities.

Outcomes 1 and 3:

> **1: An *increasing and more reliable cane supply*, primarily through the implementation of robust farming systems that enhance economic and environmental performance, and are less vulnerable to the impacts of adverse factors such as disease and climate variability**
>
> **3: *Demonstration of environmental sustainability* to the satisfaction of all stakeholders**

Enhancing cane supply is one of the keys to profitability in the sugar industry through maximising returns per unit of costs. Narrowing margins due to commodity price fluctuations, impacts of variable climate and alternative land uses necessitate innovation to improve cost-efficiency and profitability. Whilst acknowledging the economic imperatives, farming practices also need to minimise impacts on the environment and other ecosystems. In fact, growers commonly report that modern practices that enhance environmental sustainability also increase profitability. Many elements (including varieties, water and nutrient inputs, pest management and timely operations) must be integrated into a workable and robust farming system. Systems thinking and a focus on the implementation of changed practice are therefore critical to success.

A significant proportion of SRDC's investments, particularly in Program B, are directed towards these outcomes. They address the **National R&D Priority** of ***An environmentally sustainable Australia*** and the complementary **Rural R&D Priority** of ***Sustainable natural resource management***.

Overcoming soil constraints

SRDC's major farming systems investment over the last 13 years has been through the Sugar Yield Decline Joint Venture (SYDJV). The SYDJV has designed, and verified the benefits of, an improved farming system based on minimum tillage, controlled traffic, trash blanketing and legume rotation crops. The farming system delivers consistently higher yields across the crop cycle through improved soil health, coupled with lower fertiliser, labour and machinery costs. The final report of the SYDJV will be delivered in 2006–07, and further studies are underway in several projects that are building on the outputs of the SYDJV. Key ongoing research issues include nitrogen dynamics, nutrient stratification, interface issues between cane and fallow crops, water infiltration and efficiency of use, indicators of soil biological health including free living nematodes, and machinery development. The core farming systems project will assist in coordinating several related initiatives, including other SRDC-funded projects described in the following paragraphs, and the Future Cane project funded by QDPI&F and BSES Limited, which seeks to promote adoption of the improved farming systems developed by the SYDJV.

An earlier SRDC project released a new soybean variety for use as a break crop between sugarcane crop cycles, and further multiplication and release of this variety will proceed in 2006–07. A further project is aiming to provide at least two additional varieties: a small seeded (to give high germination and high vigour), light hilum, long duration, high biomass, nematode, rust and phytophthora root rot resistant replacement for the existing green manure/rotation soybean variety Leichhardt; and a well-adapted, high tofu-quality variety for those growers who seek to access the high-end export markets for beans to north Asia.

Projects focusing on nutrient management will integrate the considerable body of past knowledge on nutrient requirements of sugarcane with new research which links nutrient management to specific soil and crop characteristics. Optimal fertiliser management is targeted at both improved profitability and minimising losses of nutrients off-farm. Field evaluation is underway of a hypothesis that nitrogen management based on nitrogen losses during the previous crop, including removal in the cane, would lead to better linking of nitrogen application to crop demand, lower nitrogen use, and reduced nitrogen losses to the environment. Related work will extend previous studies in the Herbert and Bundaberg areas that link nutrient recommendations with knowledge of nutrient supply characteristics of different soil types. These projects will be closely integrated and will jointly conduct an annual industry workshop to promote improved nutrient management, which will result in better targeted fertiliser application, lower costs and reduced nutrient losses in off-farm water flows, while maintaining or enhancing sugar yields.

Managing water more sustainably

Two continuing projects are focussing on the interactions between water management and productivity in the irrigation areas of Queensland and the Ord River Irrigation Area in Western Australia. These studies are showing that water use can be reduced in the

latter part of the season with no yield penalties, and even yield benefits where the amount of lodging is reduced. Reduced water use also lowers irrigation costs and the risks of rising water tables, salinity, and loss of nutrients to groundwater. Practical methods of implementing improved irrigation practices in the Burdekin will be developed through groups of growers who will evaluate the economic and environmental benefits in partnership with researchers. Improved precision of irrigation will minimise loss of nutrients to run-off and groundwater and help to avoid rising water-tables and the risk of salinity.

Two new grower-led projects will examine complementary aspects of sustainable water management in the Burdekin River Irrigation Area (BRIA). Rapidly rising saline groundwater is a threat to much of the BRIA, which has been irrigated for cane production for only about 15 years. Groundwater is known to be within 1–2 m of the soil surface in two localities. The first project seeks to identify the relative contributions to groundwater from furrow irrigation, leaking supply channels and large tail-water recycle dams in the region, as the basis of identifying means of reducing ground water accretion.

BRIA farms have been laser-levelled and slopes are very slight. The current farming system is designed for furrow irrigation in very long rows (commonly 1–1.5 km) that do not allow retention of harvest residues, because the trash slows water flow, but are cost-efficient for harvesting and other farm management inputs. The second project will investigate low-pressure overhead irrigation and drip irrigation through trickle tape, as potential solutions that can both reduce the volume of water applied, and allow green cane harvesting to be adopted without shortening row lengths.

A project established early in 2006 will conduct a review of institutional arrangements in the BRIA, with a view to delivering sustainable water management practices in the region with the collaboration of all stakeholders.

A third new project on irrigation management will build on previous work which produced a decision support framework for improved irrigation scheduling. The web-based program is currently being successfully implemented by growers in the Bundaberg area. The project will extend the irrigation scheduling improvements to most major irrigation regions (including the Burdekin, Mareeba, Central, Bundaberg and Maryborough regions), and will evaluate a commercial service for delivery of irrigation scheduling advice in selected areas. Lessons from project CSE009, which investigated means of obtaining broad adoption of innovations from trial programs, will be applied.

A continuing project has established grower-participatory water quality monitoring in sugarcane sub-catchments within the Herbert. Rapid feedback of water quality results from caneland runoff will increase awareness of the relationship between land management practices and water quality, improve the level of consultation and collaboration between Herbert landholders and the community, and validate improved farming practices and risk management procedures for minimising off-site nutrient movement.

A project based in an acid-sulphate soil area in NSW will construct a wetland to assess its ability to control toxic discharges and trap sediments that include nutrients and metal compounds. The wetland will be designed so that sediments can be removed periodically and returned to the land. Monosulphide materials in the sludge will be evaluated for their suitability as a catalyst for removing sulphur in the petrochemical industry.

Enhancing integrated pest management and minimising incursion risks

Canegrubs are the sugar industry's most damaging insect pest. Work will continue to promote adoption of decision support systems for management of greyback canegrub, and to develop means to integrate control of greyback and Childers canegrub into the improved farming systems developed through the SYDJV. The current use of intensive cultivation for control of Childers canegrub is at odds with the promotion of a farming system based on low-cost minimum tillage that also preserves organic matter and soil biodiversity.

A new project in 2006–07 seeks to fill a gap in the management of greyback canegrub in rain-fed areas by investigating options for trap crops. The project will assess the economics of all options tested. Data suitable for use in MRLs and subsequent registration of herbicide desiccants for this purpose will be collected during the project.

This aspect of Outcomes 1 and 3 also addresses the **Rural R&D Priority** of ***Maintaining and improving confidence in the integrity of Australian agricultural, food fish and forestry products***. Raw sugar is a processed commodity with an extremely low risk of medically significant contamination. Previous SRDC–funded research has established that residues of agricultural chemicals are negligible or undetectable. Nevertheless projects addressing integrated past management will generally lead to reduced use of pesticides. IPM for canegrubs can involve replacement of chemical insecticides with the commercial biological control product BioCane, which is based on the Metarhizium fungus. These initiatives are being promoted as part of systems approaches to canegrub control and will enable the sugar industry to maintain its record of sugar products free from chemical contamination. One of SRDC's postgraduate scholarship recipients is studying IPM of rodent pests in sugarcane, which will help to reduce chemical usage in the industry.

To ensure a resilient farming system, it is important to protect the Australian sugar industry from exotic diseases and pests. SRDC's investments in this area address the **National Research Priority** of ***Safeguarding Australia*** and the **Rural R&D Priority of *Protecting Australia from invasive diseases and pests.***

The sugar industry is vulnerable to attack from invading pests and diseases, considering its location in the tropics adjacent to many of Australia's near neighbours. SRDC has supported, and will continue to promote, activities to identify potential risks and establish contingency plans to deal effectively with possible incursions. SRDC has also

invested substantial funding in recent years on diagnostic and taxonomic investigations to assist with insect and disease quarantine, and on development of plans to assist in preparation for and management of any invasion.

The greatest disease risk to the sugar industry in Queensland and NSW is sugarcane smut, which occurs in most other sugarcane-growing regions of the world including the Ord River Irrigation Area of Western Australia and can spread over long distances by wind-blown spores. For several years, SRDC has funded a program of screening sugarcane varieties and advanced clones in Indonesia for resistance to sugarcane smut in partnership with BSES and the Indonesian Sugarcane Research Institute. This program was significantly expanded from 2004–05 to enable the screening of early generation selections from the sugarcane breeding program, which will speed up the identification and release of new elite, smut-resistant varieties. One of SRDC's postgraduate scholarship holders is investigating means of rapid screening for smut reaction of new clones.

Developing improved breeding technologies

Varieties are an important part of a productive farming system. The provision of improved varieties has been a long-term component of the industry's approach to productivity, and has been a key area of investment since SRDC's inception. Several of SRDC's investments underpin genetic improvement through the development of improved breeding technologies. SRDC also recognises that the realisation of such genetic gains will only be possible by combining better soil management with timely management of inputs in an integrated farming system.

One project is developing complex software which requires large computing power to assist breeders to evaluate all known information when making decisions about which varieties to use as parents in the breeding program, and which lines to release as new varieties. Similar software is available for some other crops, but it has not been developed for a crop with sugarcane's genetic complexity. The outcome will be greater industry profitability through a more efficient and effective breeding program which produces elite varieties that are selected either for particular benefits (eg high fibre production for cogeneration) or maximum general benefit across the industry value chain.

This and other aspects of the sugarcane plant improvement program address the **National and Rural R&D Priorities** of ***Using frontier technologies for building and transforming Australian industries***.

One new project which commenced in 2005–06 will seek to better understand the interactions between sugarcane genetics (gene expression) and environment (including water and nutrient management) with respect to sugar accumulation (which is a current gap in knowledge of sugarcane physiology), to use both improved varieties and management practices to increase sugar yield.

Another major continuing project will build on R&D conducted by CSR Sugar and the University of Queensland to develop their "Sugar Booster" technology, which has shown promise of producing the value added-product isomaltulose as well as higher yields of sucrose and other fermentable sugars. This project will also explore pathways for agronomic evaluation and regulatory assessment of GM sugarcane.

SRDC is a core party to the CRC for Sugar Industry Innovation through Biotechnology (CRCSIIB) which commenced in August 2003. SRDC has committed $4.9 million of project funding over seven years from 2003–04. The CRC has considerable potential to rejuvenate the sugar industry and contribute strongly to the national economy through elite sugarcane varieties with high sugar production or which can produce specialist materials such as bioplastics, oligosaccharides, enzymes and pharmaceuticals. The allocation of SRDC funding to projects has not yet been finalised for 2006–07, but one new project will assess the possibility of cross-pollination of genetically-modified (GM) cane with wild canes and grasses, and transfer of modified genes into other species. This information is required before approval could be obtained for commercial release of GM sugarcane. The project will also increase the fundamental knowledge of reproductive biology of sugarcane, which will be valuable more broadly than for GM varieties.

Enhancing genetic yield potential

The SRDC R&D Plan targets closer integration of conventional and biotechnological approaches to the breeding of sugarcane varieties. Projects to be conducted through the CRCSIIB will target breeding for elite traits, including increased sugar content and resistance to pests and diseases.

A new project in 2006–07, in conjunction with the improved farming systems initiatives, will address a demand from growers for information on the varieties that perform best under controlled traffic farming systems. Current varieties were selected under conventional 1.5m row spacings, and new varieties may be needed for wider rows. The project will determine whether changes are needed to variety selection procedures.

Improving farm business and risk management decision-making

A continuing project based in the Herbert and Burdekin in conjunction with FutureCane will increase the level of economic information available to cane farmers in a range of formats, to build their capacity to use economic and profitability data as well as productivity figures in their decision making. This will support benchmarking activities being developed in the Burdekin through other initiatives. SRDC is also developing economic case studies of growers who have adopted innovative farming practices. These growers will discuss the economic and productivity outcomes of their innovations at regional farm-walks and workshops to which other growers are invited. Growers learning from growers improves the credibility of research findings and leads to greater uptake of improved practices by other growers.

Managing the impacts of climate variability is an important factor in enhancing the robustness of sugarcane farming systems. SRDC is a partner in the joint RDC Managing Climate Variability Program which has commissioned a range of projects. One of the approved projects aims to identify advanced climate forecasting systems to improve both short term (seasonal) and long term (decadal) risk management and planning in the sugar industry. A new SRDC project in 2006–07 will determine the skill of a long lead climate forecasting model in the Australian sugar industry, and assess industry demand for a forecasting model that can predict in February the probability of rain during the later half of the harvest season. If successful, the model will be applied in selected regions over a two year period to deliver information that improves decision making and enables more precise marketing forecasts.

Another new project in 2006–07 will provide a web-based decision-support system to optimise returns from the choice and management of varieties. A grower consultative committee will provide input, and access to mill productivity data on approved varieties will be sought to complement trial data. It is hoped that an interactive website will enable growers to add their own experiences with varieties to the information available from trials.

In 2004–05, SRDC contracted with the Department of Agriculture, Fisheries and Forestry to manage, over three years, a major initiative to implement a Farm Management System (FMS) Framework for the Sugar Industry, with funding from the Natural Heritage Trust (NHT). This initiative had five sub-programs, three of which concluded during 2005–06. Activities continuing in 2006–07 include improving the FMS tools and materials to meet the needs of cane growers across the regions, assisting several growers to test FMS on their own farms, and the overall evaluation of the program. The related NHT-funded program led by the CANEGROWERS organisation will continue to raise awareness in cane growers of the economic and environmental benefits of incorporating and integrating a range of initiatives within a management framework that facilitates increased productivity and better environmental outcomes.

The program will be evaluated through assessing the impacts to the industry and the wider community from adoption of FMS, determining changes in attitudes to FMS as a result of project activities, determining satisfaction of stakeholders with the FMS projects, and communicating information about effective project management and the social aspect of adoption/non-adoption of FMS.

Facilitating tailored farming systems

Several continuing projects will assist groups of growers to cooperatively develop the new farming system to suit local conditions, and demonstrate economic and environmental benefits. These projects will facilitate the implementation of improved farming systems in four regions: Central (through establishment of new cropping system trials with both existing and new productivity groups, and by developing Best Practice Guidelines for dual-row cropping systems); Innisfail-Babinda (through enhancement of

grower group processes); NSW (through a participative process to collate existing productivity data from the top 20% (by gross $/ha) of farmers, and identify opportunities for broad implementation); and the Ord River Irrigation Area (through grower-managed trials of new farming systems).

Grower Group Innovation Projects (GGIPs) are a new SRDC initiative from 2005–06. They are projects managed by grower groups to develop and build their capability to conduct their own R&D into more profitable and environmentally sustainable sugarcane farming systems. More details are provided under Outcomes 5 and 6. Several GGIPs are examining aspects of improved sugarcane farming systems in various regions of the industry, and are enhancing implementation by growers of outputs of the SYDJV. Topics studied in current GGIPs include controlled traffic, GPS guidance, zero tillage planting, legume rotation crops, nutrient management and soil health.

Outcomes 2 and 4:

> **2: *Facilitation of change* which promotes adoption of whole-of-system solutions to *enhance revenue and cost efficiency across the value chain* at mill area and regional levels**
>
> **4: *Diversification of the income stream* from products derived from sugarcane**

SRDC's investments towards these outcomes address the **National R&D Priority** of ***Promoting and Maintaining Good Health*** and the **Rural R&D Priorities** of ***Improving competitiveness through a whole of industry approach; Maintaining and improving confidence in the integrity of Australian agricultural, food, fish and forestry products; and Improved trade and market access.*** Many investments in milling technologies and diversification options also address the complementary **National and Rural R&D Priorities** of ***Using frontier technologies for building and transforming Australian industries, and Creating an innovative culture***.

Program A of the R&D Plan 2003–2008, **Value Chain Integration**, provides a specific focus for investment in R&D directed towards whole-of-system solutions. SRDC's investments in **Program C, Processing and Distribution Systems**, are also directed towards these outcomes.

Developing options for enhanced value chain efficiencies

Several projects in 2006–07 will focus on opportunities to increase the value of the industry through integrated action across the value chain, which lead to greater gains than could be achieved through action in the individual profit centres alone.

A major thrust towards this outcome is R&D on whole-of-system impacts of alternative cane supply management systems. Several recent projects demonstrated the potential for sustainable economic improvements by redesigning harvest and transport scheduling using systems modelling tools. New models have integrated knowledge of geographical

harvesting, causes of cane and sugar losses, transport schedules and numbers of harvest and transport units, to implement change in the harvest and transport systems. SRDC conducted a synthesis of previous value chain projects in the Australian and overseas sugar industries, which contributed to a workshop in 2005–06 to identify and action new opportunities in value chain research. The SRDC publication *Value Chains in the Australian Sugar Industry*, which was launched by the Parliamentary Secretary, The Hon. Sussan Ley MP, in March 2006, summarised the outputs of the synthesis and the workshop. Several new projects approved for 2006–07 are derived directly from initiatives identified at the workshop.

Implementing regional value-chain improvements

A series of projects is focussing on the facilitation of change through regional or mill area plans. In Mossman, a regional partnership with a broad range of industry and community stakeholders is targeting improved adoption of best practice in cane production, including by accreditation of "eco-efficient" farmers, efficiencies in harvest and transport by pursuing whole-of-system strategies and outcomes, and supporting tree planting as part of the Douglas Shire Sustainable Futures Strategy.

In NSW, an industry system based around whole of crop harvesting to support cogeneration is being evaluated, which will necessitate modified farming, harvesting, transport and milling systems and will contribute to renewable energy production. A new project in 2006–07 seeks to utilise existing data to provide real time harvester information to growers, harvesters and millers to improve the communications across, and the efficiency of, the Harwood Mill value chain. This project builds on an SRDC Travel and Learning Opportunity Project in 2005–06 that enabled Harwood district harvesting stakeholders to work together to identify priorities for future improvements. The project outputs are expected to be relevant to other mill areas.

In the Herbert, benefits worth $5 million per annum could be realised through extended season length through improved utilisation of capital, improved efficiency of harvester scheduling, and improved ratoon performance. A substantive new project in 2006–07 will build on this and other previous initiatives to improve operations across the Herbert value chain. The industry has demonstrated commitment to achieving the project objectives, as a special levy will be collected to enable industry to contribute to the cost of this project. The project will focus on achieving both social "capacity building" outcomes, and technical outcomes, and will clarify how the social issue of engagement across the value chain will be achieved.

A new project to optimise road transport scheduling in the Maryborough district will build on previous work to improve efficiencies across the harvest-transport-milling interface. The project team will include on-the-ground stakeholders, in particular growers, harvesters, mill and community representatives. A strong emphasis on the delivery of change will be implemented to ensure that benefits are realised.

A new project in the Burdekin seeks to utilise NIR data and productivity data to improve measurement and feedback systems across the Burdekin value chain. The project has potential to contribute to providing market signals to all stakeholders. The ultimate outcomes include improved efficiency of growing, harvesting, and milling operations leading to economic, social and environmental benefits. If successful, this project could have significant implications for many other regions of the Australian sugar industry. The project will evaluate precision agriculture systems to examine the causes of yield variability and assess possible solutions.

New work in the Tully mill region will apply existing technologies (SugarMax and Harvest Max) to the Tully district to optimise harvest and transport operations to maximise CCS and yield. The project will involve key individuals from the Tully growing and milling sectors. It will consider social R&D support to address the social/people issues, and will build on experiences in implementing SugarMax in other regions.

SRDC will seek to combine elements of two proposals to enable both social and technical outcomes to be achieved by the one new value chain project in the Innisfail–Babinda region. There may be some delays in finalising the project due to the damage from cyclone Larry. The project will seek to implement improved harvest and transport operations in the Mourilyan, Innisfail, and Babinda mill areas. The aim will be to capture some of the $0.91/t gains identified in previous studies as possible through improved harvest and transport operations. The project will also seek to improve relationships between key sectors in the Innisfail–Babinda sugar industry value chain.

Implementing more cost-efficient harvesting systems

Harvesting is a major linking point in the sugarcane value chain, and improved harvest efficiency has potential for economic and environmental benefits. In February 2005, the then Parliamentary Secretary, The Hon. Senator Richard Colbeck, launched the SRDC publication *Cane Harvesting to Improve Industry Performance*. To support this initiative SRDC invited proposals for Harvesting Group Innovation Projects (HGIPs) for 2005–06, and many of these will continue in 2006–07.

Two HGIPs underway in the Herbert are seeking to improve the cost-efficiency of harvesting through monitoring of time and costs spent in each paddock, and through incentive systems that encourage farmers to improve the layout of their farms and contractors to improve the quality and quantity of the product. Another project in the Mackay area is developing a web-based cane loss forecasting tool to enable growers and harvesting contractors to identify the true value of harvesting best practice, and provide a basis for the sharing of the additional revenue that its adoption will create.

Two projects in the Bundaberg area are investigating complementary approaches to reducing sucrose losses during harvesting. One project is showing promise in developing equipment to rapidly measure in-field sucrose loss, which has been effectively invisible to growers and harvesters. This will enable rapid feedback to harvester operators, which

should increase adoption of harvesting techniques that are known to reduce sucrose losses. The other aims to develop a modified rotary pinch chopper system which can be retrofitted to existing commercial harvesters. This system will reduce juice losses though synchronisation of chopper and feedtrain speeds.

A continuing project based in NSW is seeking to demonstrate that harvest and transport costs can be reduced to $4 per tonne of cane through a range of measures including trialling automated harvest recording and feedback and establishment of a single, integrated harvesting cooperative in each mill area. Another project will build on current best practice harvesting initiatives through implementing harvester modifications to ensure that harvester component speeds are synchronised with ground speeds. This will lead to reduced sugar loss and stool damage, and higher harvested yields in the current crop and subsequent ratoons. With the increasing emphasis by some mills in transporting additional leaf and tops along with cane billets to the mill for electricity generation, increased transport costs (bulkier and lighter bin contents) are an issue of interest to millers in particular. A new project will evaluate a different harvester chopper arrangement that produces a cleaner cut (possibly reducing cane loss) and also allows shorter cane billets for better packing and hence higher transport bin weights.

A continuing project based in NSW but operating in several regions seeks to achieve improvements in cane quality and reductions in cane loss by equipping harvester operators with a real-time display of their performance against Harvest Best Practice (HBP) guidelines. Harvester operators will learn what is expected in different circumstances to comply with HBP, and compliance reports will be able to be used as key performance indicators in harvester contracts. Another project based in the Burdekin will create a benchmarking system to enable harvest groups to compare their performance with other groups. The resulting information will enable groups to improve their performance by determining how changes in harvest group structures and arrangements will impact on harvesting costs, and test value chain integration options and harvesting cost models.

In Mossman, a new payment system for growers and harvesters that equalises payments over the season will be evaluated in the 2005 season, leading to improvements in transport efficiency through maximising quantities of cane delivery within geographic zones, and maximising sugar production within groups and individual farms through more efficient scheduling.

Enhancing cost-efficiency in milling and transport systems

Several projects are seeking improved sugar quality and efficiency of extraction through improvements to factory-based processes for juice separation, clarification, evaporation, precipitation, and crystallisation, which will lead to cost efficiencies in these processes. Benefits include increased compliance with premium grade sugar criteria, reduced scaling in evaporators and increased capacity of evaporators. Adoption of syrup clarification will lead to increased compliance with quality specifications, reduced

costs of producing high pol sugars, increased recovery of sucrose and an opportunity to supply niche markets within Australia and overseas. Improved mud filtration systems will reduce the cost of transporting mill mud back to the canefields and enable it to be transported to more distant farms, reduce the capital cost of mud filtration, and improve sugar recovery.

With deregulation of sugar marketing arrangements, individual mills have greater responsibilities in managing impurities in raw sugar. A new project will undertake a review of recent R&D including student research. An industry workshop to discuss the findings from the review and agree on future pathways will also be supported by SRDC.

Evaluation of a new cleaning formulation will, if successful, lead to reduced operating costs for chemical cleaning, reduced labour, simplified handling and storage of chemicals, and improvements in occupational health and safety.

Diversifying industry income streams

Improved cost and energy efficiencies in factory and storage processes will also lead to enhanced steam and energy generation from bagasse. A project investigating low cost and energy efficient ambient drying of large-scale bagasse and trash stockpiles will lead to increased power export capability, new revenue streams and profitability of cogeneration projects that involve the stockpiling of bagasse and trash for out of season power generation.

Other projects discussed earlier in this section are investigating whole crop harvesting and/or expansion of season length, which will, among other benefits already described, result in greater amounts of bagasse and trash available for electricity generation.

Studies conducted through the CRCSIIB are investigating means of producing specialist materials such as bioplastics, oligosaccharides, enzymes and pharmaceuticals in elite sugarcane varieties, and extraction and fermentation technologies which can lead to improved processes for production of foodstuffs, nutraceuticals and feedstocks such as ethanol. The Sugar Booster project discussed under Outcomes 1 and 3 will investigate production of alternative high value sugars.

A continuing project is developing novel biodegradable composite materials for the packaging industry. If successful, the project will establish a new sustainable commercial opportunity for the local sugar industry that potentially can replace non-degradable fossil fuel based packaging and building materials.

Two new projects in 2006–07 will investigate aspects of furfural and fuel production from bagasse. One will compare a new process for production of furfural from bagasse with an existing technology that is being implemented at Proserpine Mill. Proserpine Mill will be involved in the project, but the outputs will have strategic value for all Australian mills. The other project, also in collaboration with Proserpine Mill, will support a Masters student to investigate high-value products from the waste residue of the Suprayield process.

Outcomes 5 and 6:

> **5: *Enhancement of human capacity and partnerships* between industry, research and regional communities to underpin change, learning and innovation**
>
> **6: An *effective R&D capability* underpinning industry futures.**

These Outcomes address the **National and Rural R&D Priorities** of ***Using frontier technologies for building and transforming Australian industries*** and the **Rural R&D Priority** of ***Creating an innovative culture***. They also address the **National R&D Priority** of ***Promoting and maintaining good health***.

Program D (**Industry Capacity**) of the SRDC R&D Plan 2003–2008 is specifically devoted to building the human capacity for change, learning and innovation in the sugar industry.

Building leadership and management capacity

Several initiatives to support leadership development programs will continue in 2006–07. A continuing project will apply a leadership program developed for rural industries in southern Australia to participants from the sugar industry. The Leading Industries Program will target 60 young people who have the potential to positively impact the future of the industry. The outcome is people who are aware of their skills, how the industry system works, and the various opportunities for industry involvement.

SRDC conducted its first Generation Next Forum in February 2006, where around 40 younger industry participants interacted with leaders from all sectors of the industry, and learnt skills in change management and innovation. Participants will undertake an industry project as an outcome of the Forum. This initiative will continue in 2006–07.

An innovative project commenced in 2004–05 to conduct a cultural imprint analysis in the Herbert. A range of "stories" have been collected that describe the way the community works or doesn't work together. These provide initial learnings which will be used to initiate dialogue with stakeholder focus groups about how to progress on larger industry issues such as rationalisation and economies of scale. This novel approach will deliver the opportunity for sugar industry people in the Herbert region to improve the efficiency and effectiveness of their joint operations, and will lead to economic, social and environmental benefits to the region through improved communication and engagement among stakeholders.

A continuing project aims to improve the economic, social and environmental performance of 70 cane farming businesses in the Isis cane supply area by building the capacity of these families to cope with and adapt to change and fostering their ability to implement improved business planning and management skills. As part of Isis Target 100, the project will apply the QDPI Building Rural Leaders program which delivers specialised, interactive, grower-friendly workshops on change and action learning.

SRDC will contribute to several initiatives in partnership with Department of Agriculture, Fisheries and Forestry and other Rural R&D Corporations, including the Department of Agriculture, Fisheries and Forestry's *Industry Partnerships Corporate Governance for Rural Women Initiative*, the *Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry*, and the *Cooperative Venture for Capacity Building for Innovation in Rural Industries*.

Enhancing an industry culture of continuous learning and improvement

A continuing project is assessing means of moving from case studies to broad industry implementation of new technology, and will use climate forecasting and crop simulation models as pilot technologies. The project is demonstrating the benefits from, and identify means of achieving, broad adoption of new technologies.

Three continuing research projects are focussing on enhancing and supporting the roles of women in the industry. One project is seeking to increase participation of women as active members, and in leadership roles, within the CANEGROWERS organisation. Another is building on current women's networks in the Herbert region and aiming to build capacity in leadership and communication. The third project is seeking to achieve a better understanding of the role and participation of women in industry and community-based sustainability initiatives. It will identify and implement practical strategies for improving women's involvement in the sugar industry in at least two case study regions, in the wet tropics and Bundaberg. Through this, the project will seek to achieve an improved capacity of sugar communities to deal with change, and more effective capacity building strategies to encourage an increased uptake of sustainable farming practices.

A continuing project is demonstrating the outcomes that can be achieved through productivity focused incorporated grower groups, by investigating and documenting the options for grower groups to become a registered entity or incorporated body, and by working with a pilot group. The project seeks to demonstrate how participative R&D combined with action learning can deliver greater productivity, profitability and sustainability outcomes in shorter periods of time than current sugar industry extension tools. A related project in the same mill area (Plane Creek) will build the capacity of the grower group in areas such as working in groups, project management, evaluation, science research and presentation of findings. The project will seek to generalise the results of the research in order to develop a model for farmer groups which sets out a hierarchy of capacities and skills needed, the likely barriers encountered, and suggests ways to overcome these.

In 2004–05 SRDC inaugurated Excellence in Grower Group Awards and Grower Group Innovation Projects. Excellence in Grower Group Awards are made in conjunction with SRDC's Regional Workshops in April each year to recognise innovation in grower groups.

Grower Group Innovation Projects (GGIPs) are for grower groups to develop and build their capability to conduct their own research and development into more profitable and

environmentally sustainable sugarcane farming systems. SRDC has allocated $450,000 for new GGIPs in 2006–07. Funding per project of up to $40,000 per year for two years is available for grower groups to enhance the skills of people within the group; the implementation of smart farming systems; the business profitability of group members; and their environmental performance. Funding can be used for a range of activities, including acquiring equipment for sharing within the group to test potentially better farming systems, group coordination and meetings, hosting workshops/ field days and hiring people to enhance group skills. Applications for new GGIPs were received in April 2006. These will be assessed in May 2006 and approved projects will commence from July 2006.

SRDC has promoted Travel and Learning Opportunity Project (TLOP) initiatives with two calls for proposals annually from 2004–05, with up to $200,000 funding available per year. SRDC is targeting capacity building in industry people through travel or through exposure to resource people visiting their regions, in addition to travel by researchers to workshops and conferences. SRDC provides partial funding for these activities, with partnership funding required from those travelling or from other organisations. Twelve TLOPs were approved in October 2005, for activities during calendar 2006. Applications for activities during 2006–07 were received in April 2006, and will be assessed in May 2006.

Five projects in the Innisfail/Babinda, Burdekin and NSW regions will conduct workshops or other activities to enhance learning among industry participants on topics including developing a learning culture, investigating alternative rotation crops, developing facilitator skills, community engagement, and understanding industry payment arrangements.

Several projects involve travel by industry participants to learn from people in other regions and/or industries. Around 50 Innisfail–Babinda harvester contactors and other stakeholders will examine harvesting operations being undertaken in the Herbert region, particularly multiple row preparatory tractors (mutipliers), and dual row harvesting. Another group of growers from north Queensland will travel to southern cane growing areas, including NSW, with a focus on farm management, adult learning principles, and development of knowledge, skills and understanding through action learning. Mill engineers from NSW will travel to northern and central mills to explore advances in cogeneration, milling train setup, evaporator and heater configurations, high mud loadings, maintenance, and environmental management.

Fostering targeted continuing education

Other TLOPs target increased capacity among researchers and advisers through attendance at conferences. These projects incorporate an appropriate communication strategy to ensure that benefits are communicated to the broader industry.

SRDC will continue its postgraduate scholarship program in 2006–07. Twelve continuing postgraduate scholars are studying in a range of disciplines including plant breeding and biotechnology, rodent pest management, soil health, nitrogen management and water quality in sugar catchments, environmental codes of practice, exotic pest threats, bagasse fractionation and alternative uses, and harvester decision support systems. Three of these are expected to conclude in 2006–07, and three new scholarships will be offered. SRDC conducted its first Scholarships Forum in February 2006, where scholarship recipients were able to report on their projects in the context of the wider industry. This initiative will be repeated in 2006–07.

SRDC will conduct a review in 2006–07 of the Innovator of the Year Award (with Queensland Sugar Limited) and the SRDC Research/Extension and Service to Industry R&D Awards, which have been offered for several years to recognise excellence in research and/or extension in the sugar industry, and honour exemplary service in the support of R&D to benefit the industry.

Improving health and safety

SRDC is a participant in the RDC Joint Venture for Farm Health and Safety. Healthy Farm Families workshops developed through the joint venture will be conducted in the Burdekin and Herbert regions in May 2006, and subsequently in other regions depending on demand. Several other projects conducted by the joint program will also be relevant to sugarcane growers, including all-terrain vehicle safety and injury prevention, children's safety on farms, and incentives for adoption of safe farm work systems.

Improving the effectiveness of R&D systems

A continuing project will provide data to calculate key performance indicators for the innovation and change in the milling sector, including cost comparisons, implementation of environmental management, new products, and enhanced management skills.

A new project in 2006–07 will develop a Sugarcane Research Experiment Management System. This will create a database of results from physiological and agronomic experiments in the Australian sugar industry, and facilitate the utilisation of this resource by stakeholders. The project team will develop options for how the system can be adapted for data from a wide range of projects, enable industry access, and be maintained beyond the life of the project.

Allocation of SRDC investments across National and Rural R&D Priorities

Table 4 summarises SRDC investments allocated to each of the National and Rural R&D Priorities within the Outcome groups discussed in this section.

TABLE 4. COMPOSITION OF GOVERNMENT RESEARCH PRIORITIES ATTRIBUTED TO EACH OUTCOME GROUP ($'000 AND % VALUES) — 2006–07

National Research Priorities (NRP)	**An Environmentally Sustainable Australia**		**Promoting and Maintaining Good Health (strengthening Australia's social & economic fabric)**						**Frontier Technologies for Building and Transforming Australian Industries**				**Safeguarding Australia**			
Rural Research & Development Priorities (RRDP)	*Sustainable Natural Resource Management*		*Improving Competitiveness through a Whole of Industry Approach*		*Maintaining & Improving Confidence in the Integrity of Australian Agricultural, Food, Fish and Forestry Products*		*Improved Trade and Market Access*		*Use of Frontier Technologies*		*Creating an Innovative Culture*		*Protecting Australia from Invasive Diseases and Pests*		*Other Research*	
	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%
Program B: Outcomes 1 and 3	2,636	44	240	4	120	2	–	–	1,737	29	1,078	18	180	3	–	–
Programs A and C: Outcomes 2 and 4	144	4	2,450	66	90	2	112	3	401	11	516	14	–	–	–	–
Program D: Outcomes 5 and 6	205	9	46	2	23	1	–	–	68	3	1,890	83	46	2	–	–
TOTAL	2,985	25	2,736	23	233	2	112	1	2,206	18	3,484	29	226	2	–	–

ATTACHMENT A

PROJECTS AND SCHOLARSHIPS IN 2006–07
APPROVED AT APRIL 2006

Project	Title	Duration	Contact	Funds 2006–07
Program A	**Value Chain Integration**			
Strategy A1	***Develop knowledge, technologies and implementation processes to optimise the use of whole-of-system resources***			
Continuing Projects				
BSS264	Adoption of an optimal season length for increased industry profitability	Jul-04–Sep-07	Mr Lawrence DiBella	$61,000
CSR033	Benchmarking harvest group practices in the Burdekin	Jul-05–Nov-07	Dr Lisa McDonald	$52,509
CVA002	Managing Climate Variability Program	Sep-03–Sep-07	Dr Tracy Henderson	$40,000
MAS001	A regional partnership approach to developing a sustainable sugar cane system	Jul-03–Sep-07	Mr Allan Rudd	$40,096
NSC005	Implementing an integrated sugar system in NSW	Jul-03–May-08	Mr Rick Beattie	$50,000
New Projects				
CHC002	Development of a real time information system for Clarence harvesters	Jul-06–Sep-07	Mr Peter Rose	$41,600
CSR038	Increasing in-mill NIR effectiveness and communicating data to all sectors for improved decision making in the sugarcane value chain	Jul-06–Jul-09	Dr Lisa McDonald	$131,000
JCU027	Defeating the autumn predictability barrier	Jul-06–Jun-09	Dr Yvette Everingham	$71,920
MSF002	Implementing integrated harvest-transport-milling logistics through adoption of optimised road transport scheduling	Jul-06–Jun-08	Mr Peter Downs	$59,300

Project	Title	Duration	Contact	Funds 2006–07
Strategy A2	***Facilitate sustainable whole-of-system change using a cooperative approach across the industry value chain***			
Continuing Projects				
CSE005	Integrating and optimising farm-to-mill decisions to maximise industry profitability	Jul-02–Jul-06	Dr Andrew Higgins	$35,000
CSE009	Moving from case studies to whole of industry: Implementing methods for wider industry adoption	Jul-03–Oct-07	Dr Yvette Everingham	$178,822
HGP004	Demonstrate the true value of harvesting best practice and provide the basis for the sharing of the additional revenue created by its adoption	Jul-05–Mar-07	Mr Jim Crane	$40,000
HGP006	Improved harvesting efficiency in farming systems	Jul-05–Feb-07	Mr Brian Tabone	$40,000
HGP007	Siding roster optimisation in the Herbert	Jul-05–May-07	Mr Franco Zaini	$15,000
HGP008	Incentive price harvesting signals versus traditional payment system	Jul-05–May-07	Mr Anthony Girgenti	$15,000
MAS002	Improving harvest efficiency in the Mossman Central Mill area	Feb-05–Apr-07	Mr Daryl Parker	$16,763
NSC006	Achieving world's best practice harvesting and transport costs for the NSW sugar industry	Jul-04–May-07	Mr Rick Beattie	$124,728
New Projects				
CGH002	Exploring and implementing enhanced value adding opportunities in the Herbert industry	Jul-06–Jun-09	Mr Peter Sheedy	$228,450
CGT001	Development and implementation of harvest management planning tools for the Tully district	Jul-06–Jun-09	Mr Trent Stainlay	$47,000
CSE018	Integration of harvest and transport in a unified Innisfail Babinda supply chain	Jul-06–Jun-08	Dr Andrew Higgins	$132,150
Total for Program A				**$1,420,338**

Project	Title	Duration	Contact	Funds 2006–07
Program B	**Farming Systems**			
Strategy B1	***Develop knowledge, technologies and implementation processes to underpin sustainable farming systems***			
Continuing Projects				
CG013	Growers working together to improve water quality in the Herbert Sugar Industry	Jul-05–Aug-08	Dr Tim Wrigley	$97,026
CG018	A review of institutional arrangements in the Burdekin Irrigation Area with a view to managing sustainable farming practices in the region	Mar-06–Apr-07	Dr Tim Wrigley	$74,675
CPI009	New soybean varieties for fallow cropping of sugarcane fields	Jul-05–Oct-08	Dr Andrew James	$74,216
CSE007	Implementation of irrigation practices for profitable resource efficient sugarcane production in the Ord	Sep-02–Sep-06	Dr Geoff Inman-Bamber	$22,600
DPI015	Enhancing an economic way of doing business in the cane industry	Jul-05–Aug-08	Mr Neil Sing	$80,000
UNW003	Development of a constructed wetland for improving water quality in sugarcane drainage, and ensuring its community acceptance and industry adoption	Jul-04–May-07	Assoc Prof Mike Melville	$27,496
WCA001	Development of a precision spot spray system using spectral analysis and plant identification technology	Jul-06–May-07	Mr John Rowe	$90,000
New Projects				
BSS294	Whole-farm planning for management of varieties to maximise productivity and reduce losses from diseases	Jul-06–Jun-09	Mr Barry Croft	$164,348

Project	Title	Duration	Contact	Funds 2006–07
Strategy B2	***Improve the genetic performance of the sugarcane plant for increased sugar production in diverse environments and for the generation of new products***			
Continuing Projects				
BSS256	Reducing the Australian sugar industry's genetic vulnerability to sugarcane smut	Jul-02–Apr-07	Mr Barry Croft	$45,834
BSS265	Smut-proofing the Australian industry — ensuring a reliable cane supply through reduced genetic vulnerability to sugarcane smut	Jul-04–Apr-10	Mr Barry Croft	$91,789
BSS267	Maximising whole-of-industry benefits from the Australian sugarcane improvement program through an optimal genetic evaluation system	Jul-04–Sep-07	Dr Xianming Wei	$213,217
CSE014	Increased CCS, cane yield and water use efficiency by exploiting interactions between genetics and management	Jul-05–Aug-09	Dr Geoff Inman-Bamber	$313,815
ICB009	Map-based cloning of a rust resistance gene in sugarcane	Jul-02–Jul-06	Dr Robert Troedson	$0
UQ040	Extending Sugar Booster technology into multiple sugarcane cultivars for optimal deployment by Australian industry	Jul-05–Aug-10	Dr Robert Birch	$387,917
New Projects				
BSS296	Evaluation of genotypes for a controlled-traffic farming system	Jul-06–Dec-10	Dr Barry Salter	$172,385
CRC005	Understanding the reproductive biology of sugarcane to manage the safe release of genetically modified cultivars	Jul-06–Jan-10	Dr Graham Bonnett	$170,000

Project	Title	Duration	Contact	Funds 2006–07
Strategy B3	***Implement integrated solutions for sustainable sugarcane production by using a systems approach to best practice***			
Continuing Projects				
BSS257	GrubPlan 2: Developing improved risk assessment and decision-support systems for managing greyback canegrub	Jul-02–Jan-07	Dr Peter Samson	$30,000
BSS266	Optimum canegrub management within new sustainable cropping systems	Jul-04–Mar-09	Dr Peter Samson	$158,525
BSS268	Accelerated adoption of best-practice nutrient management	Jul-04–May-08	Dr Bernard Schroeder	$168,952
BSS269	A new cropping system for the Central District	Jul-04–Oct-08	Mr Errol Sander	$116,014
BSS286	Improved sugar-cane farming systems	Jul-05–Dec-08	Dr Alan Garside	$562,199
CSE011	Improved environmental outcomes and profitability through innovative management of nitrogen	Jul-04–May-08	Dr Peter Thorburn	$286,337
CSE012	Adopting systems approaches to water and nutrient management for future cane production in the Burdekin	Jul-04–May-08	Dr Peter Thorburn	$225,514
GGP004	Implementation of improved sugarcane farming systems in the Clare area of the Burdekin	Jul-05–May-07	Mr Paul Hatch	$3,000
GGP005	Healthy farming in the upper Haughton	Jul-05–Mar-07	Mr Vince Papale	$15,500
GGP006	Precision farming with controlled traffic and GPS guidance system	Jul-05–May-07	Mr Col Vassallo	$40,000
GGP007	Controlled traffic farming systems for the North Coast Grower Group	Jul-05–Feb-08	Mr John Fox	$19,000
GGP009	Implementing zero-till planting systems in the NSW sugar industry	Jul-05–Mar-07	Mr Alan Munro	$5,000
IBS002	Specialist grower groups enhancing BMP packaging & adoption in Innisfail & Babinda districts	Jul-05–Sep-07	Mr George Bugeja	$44,496

Project	Title	Duration	Contact	Funds 2006–07
WAA003	Evaluation and Implementation of modified farming systems in the ORIA	Jul-05–Aug-09	Dr Joe Sherrard	$98,633
New Projects				
BSS297	Delivering web-based irrigation management	Jul-06–Sep-09	Mr Tony Linedale	$141,737
FPP047	Building grower capacity to understand and better manage groundwater	Jul-06–Jul-09	Mr Vince Papale	$110,640
MAF002	Evaluating alternative irrigation for a greener future	Jul-06–Jun-11	Mr Chris Hesp	$89,220
PCS002	Enhancing trap cropping techniques for greyback canegrub in rain-fed cane	Jul-06–Mar-09	Mr Aaron Cauchi	$27,699
Total for Program B				**$4,167,784**

Program C Processing and Distribution Systems

Strategy C1 Develop enhanced capability in analysing and optimising processing and distribution systems

Continuing Projects				
QUT004	Commercial evaluation of alternative juice clarification processes	Jul-05–Dec-06	Dr William Doherty	$53,942
QUT011	Factory trials with a novel cleaning formulation	Mar-06–Apr-07	Dr William Doherty	$28,567
New Projects				
QUT013	Review of impurities in raw sugar	Jul-06–Dec-09	Dr Les Edye	$90,000

Strategy C2 Develop and implement innovative technology and best management practices that enhance revenue, and improve capital utilisation and environmental performance in harvest, transport, milling and marketing systems

Continuing Projects				
AGX001	Harvester best practice on-board expert system and monitoring	Jul-05–Aug-07	Mr Robert Crossley	$59,596

Project	Title	Duration	Contact	Funds 2006–07
BSS270	Regional adoption of alternative harvester configurations for sustainable harvesting efficiency	Jul-04–Sep-07	Mr Cam Whiteing	$169,180
GGP008	Overcoming barriers to controlled traffic adoption — Managing traffic during conversion to controlled traffic farming systems	Jul-05–May-07	Mr Brian Stevens	$16,000
HGP003	Modified rotary-pinch chopper system for improved harvesting efficiency	Jul-05–May-07	Mr Mike Smith	$72,000
HGP005	Develop and assess adaptability of different row spacings for harvester fronts	Jul-05–Dec-06	Mr Joe Linton	$20,000
QUT005	Determination of factory benefits from full implementation of syrup clarification	Jul-05–Sep-06	Mr Rod Steindl	$20,702
QUT012	Improving the cost-effectiveness of mud filtration through modern technology	Jan-06–Dec-07	Dr Ross Broadfoot	$84,686
SRI136	Low cost and energy efficient ambient drying of large-scale bagasse and trash stockpiles for increased industry income from power	Jul-04–Sep-06	Dr Phil Hobson	$40,457
SRI141	A preliminary assessment of methods to measure in-field sugar loss	Mar-05–Jan-07	Dr William Doherty	$16,636
New Projects				
NSC012	Single drum harvester chopper development	Jul-06–May-09	Dr Bruce Lamb	$129,900
QUT014	Recovery of sucrose part 2	Jul-06–Dec-07	Mr Kameron Dunn	$109,339
Strategy C3	***Diversify the income stream from the products of sugarcane, primarily by broadening the product base***			
Continuing Projects				
JCU025	Thermoformable biodegradable composite material from sugar cane bagasse fibre	Oct-05–Oct-07	Prof Chris Berndt	$75,030

Project	Title	Duration	Contact	Funds 2006–07
New Projects				
QUT015	Pilot scale development and evaluation of an improved process for furfural and fuel production from bagasse	Jul-06–Jun-08	Dr Les Edye	$103,539
QUT016	High value products from furfural waste residue	Sep-06–Sep-08	Dr Les Edye	$22,215
Total for Program C				**$1,111,789**

Program D Industry Capacity

Strategy D1 Enhance people's capacity to learn and change

Continuing Projects				
ABC002	Developing a learning culture within ABC.	Sep-05–Aug-06	Mr Bryan Granshaw	$2,000
ABC004	A learning experience to adopt overlap cropping of beans and cane	Jan-06–Aug-06	Mr Joe Linton	$2,000
AFF001	Corporate governance for rural women	Jul-02–May-07	Dr Tracy Henderson	$7,500
BSS278	Sugar industry training on community engagement	Jan-05–Dec-06	Mr Peter McGuire	$3,450
BSS287	Enhancing grower groups in the Australian sugar industry	Jul-05–Sep-07	Mr Robert Sluggett	$33,366
BSS291	Travel for keynote speakers to attend the Queensland Best Practice Harvesting	Jan-06–Aug-06	Mr Lawrence DiBella	$0
BSS292	Investigating marketing strategies and alternative cropping by the Mackay District Young Farmers Group	Feb-06–Aug-06	Mr Joe Muscat	$2,000
BSS293	Mackay district grower group leaders and young farmers attendance at 2006 ASSCT Conference	Feb-06–Aug-06	Mr Joe Muscat	$1,235
CG008	Targeted Planning for Profit: A grass roots program to build grower skills to manage change and implement integrated future planning	Feb-05–Feb-07	Ms Judy Skilton	$35,114

Project	Title	Duration	Contact	Funds 2006–07
CG014	Enhancing the Isis women in sugar group's knowledge and capacity to address industry issues	Jul-05–Aug-06	Ms Nicole Kirk	$0
CG015	Enhancing the knowledge of the CANEGROWERS Grain in Cane group — Investigating other Grain in Cane enterprises	Jul-05–Aug-06	Mr Allan Dingle	$1,510
CGH001	Where are the women?	Jan-06–Dec-07	Ms Sherry Kaurila	$44,741
CMC001	CANEGROWERS' strategy for women and teams	Jan-06–Aug-07	Ms Cathy McGowan	$46,631
CSE016	Sugar communities and resilience to change: Opportunities for enhancing women's participation in sustainability initiatives	Nov-05–Nov-08	Dr Emma Jakku	$104,278
CSR030	Herbert cultural imprint analysis — A pathway to greater understanding and co-operation in decision making	Jul-04–Sep-06	Mr Gavin Hughes	$45,237
CSR035	Soils and irrigation workshops — training for farmers and trainers	Oct-05–Aug-06	Dr Lisa McDonald	$2,160
CSR037	Improving the skills of CPI facilitators to interact with grower groups	Sep-05–Aug-06	Dr Lisa McDonald	$2,000
DHC001	Innovating and Developing Human Capacity in Rural Industries (joint RDC program)	Jul-01–Jul-06	Dr Tracy Henderson	$40,000
DPI018	FNQ grower farming systems tour of Southern Qld & Northern NSW	Mar-06–Nov-06	Mr Terry Reid	$2,000
FMS003	Farm Management Systems for the Sugarcane Industry, Sub-program 3: FMS training course	Feb-05–Mar-07	Mr Don Chambers	$108,545
GGP002	Development of an integrated wallaby management strategy	Jul-05–Apr-07	Mr Mick Andrejic	$20,000
IBS003	Innisfail / Babinda harvester contractors travel to the Herbert	Aug-05–Aug-06	Mr Bill Horsford	$0
LDI001	Developing the leadership capacity of the Australian Sugar Industry	Jul-05–Aug-08	Ms Cheryl Phillips	$72,887

Project	Title	Duration	Contact	Funds 2006–07
MAS003	Mossman representatives participating in the 2006 APEN and ASSCT Conferences	Dec-05–Aug-06	Mr Daryl Parker	$0
NSC011	Bringing together innovative engineers from the NSW and Northern/Central regions	Jan-06–Aug-06	Mr David Moller	$0
QUT009	Workshops for sugar factory staff to explore opportunities for increased revenues, efficiencies and reduced operational and maintenance costs	Feb-06–Aug-06	Dr Ross Broadfoot	$0
RDA002	Grower Group Awards	May-05–May-09	Dr Robert Troedson	$108,000
RDA004	Regional Innovation Awards	May-06–Jun-07	Dr Tracy Henderson	$4,800
REL001	Building grower capacity in steps	Mar-06–May-08	Dr Kate Roberts	$45,650
Strategy D2	***Foster targeted continuing education, attraction and retention of human capital throughout the industry value chain***			
Continuing Projects				
AFF002	Science and Innovation Awards for Young People	Mar-03–Sep-08	Dr Tracy Henderson	$14,000
AU002	Participate in the international conference on lepidopterous stemborers	Oct-05–Aug-06	Ms Katherine Muirhead	$0
BSS279	Improving extension capacity	Jul-05–Aug-06	Mr Dale Chapple	$1,205
CPI010	Accessing international expertise in sugarcane biotechnology	Jul-05–Oct-06	Dr John Manners	$2,000
QUT003	An integrated pest management strategy for climbing rat in the far-north Queensland sugarcane production system	Jul-05–Aug-08	Dr John Wilson	$47,425
QUT006	The 2006 Appita Conference — value adding of bagasse	Mar-06–Aug-06	Mr Tom Rainey	$0
SRD003	Generation Next Forum	Jul-05–Apr-07	Dr Tracy Henderson	$90,000
STU039	E Meier — The availability of nitrogen in GCTB soils in the wet tropics and its impact on productivity and profitability	Mar-01–Jan-07	Dr Mal Wegener	$0

Project	Title	Duration	Contact	Funds 2006–07
STU042	K Ritter — An investigation of the genetic, biochemical and molecular basis of sugar accumulation in sugarcane	Mar-02–Aug-06	Dr Ian Godwin	$0
STU049	P Wulf — Self-regulatory codes of practice & their effectiveness in achieving best environmental management practices within NQ primary industries	Jul-03–Jan-07	Prof Geoff McDonald	$24,000
STU050	Mira Durr — Microbiology of acid sulfate soils in agricultural environments	Mar-04–Jan-07	Prof Ian White	$16,000
STU052	Kylie Anderson — Invasion potential of Eumetopina flavipes, vector of Ramu Stunt Disease of Sugarcane	Jun-05–Jun-08	Dr Bradley Congdon	$42,923
STU053	Su Yin Tan — Studies on bagass fractionation using ionic liquids	Mar-05–Mar-08	Prof Doug MacFarlane	$32,000
STU054	Matthew James — Integrating the harvest, transport and milling value chain by implementing a novel data infrastructure and decision support system	Dec-05–Jan-09	Dr Duncan Campbell	$32,000
STU055	Karen Benn — The motivators and barriers to the adoption of more sustainable farming practices	Sep-05–Jul-08	Dr Janice Elder	$26,950
STU056	Kenji Osabe — Development and application of a mature stem specific promoter in sugarcane	Feb-06–Jul-09	Dr Robert Birch	$32,000
STU057	Tom Rainey — Improved bagasse fibre properties for the manufacture of paper, board and composite materials	Feb-06–Jul-09	Dr William Doherty	$35,000
STU058	Jane Churchill — Rapid screening tools for smut reaction in sugarcane varieties	Jan-06–Jan-09	Dr Serge Kokot	$32,000
STU059	Anna Satje — Improving the cation retention capacity of cane-growing soils using high activity clays	Mar-06–Sep-09	Dr Paul Nelson	$37,980

Project	Title	Duration	Contact	Funds 2006–07
Strategy D3	***Promote safe healthy workplaces through the adoption of appropriate OH&S work practices***			
Continuing Projects				
OHS002	Farm Health and Safety R&D Program 2002 — 2006	Jul-02–Sep-06	Dr Les Robertson	$20,000
Strategy D4	***Promote more effective coordination of R&D activities across industry and R&D providers, and enhance the performance of the R&D system through evaluation, review, and feedback***			
Continuing Projects				
FMS005	FMS program 5. Evaluation of FMS	Nov-04–Mar-07	Dr Lisa McDonald	$15,914
GGP001	Group Innovation projects liaison and support	Aug-05–Jul-07	Dr Robert Troedson	$120,000
RDA001	Innovator and R&D Awards	Jul-03–May-08	Dr Tracy Henderson	$12,000
SRI140	Documenting changes in the performance of the Australian sugar industry milling sector 2003–2008	Jan-05–Jan-08	Dr Geoff Kent	$0
WS009	Assessment of regional R&D needs and opportunities	Jul-03–Jun-08	Dr Tracy Henderson	$55,000
New Projects				
CSE017	Sugarcane research experiment management system	Aug-06–Aug-11	Dr Sarah Park	$62,049
Total for Program D				**$1,485,550**

ATTACHMENT B

ORGANISATIONAL IDENTIFIERS IN PROJECT CODES

Project Codes	Organisation
ABC	Advance Burdekin Collective
AFF	Department of Agriculture, Fisheries and Forestry
AGX	Agtrix Pty Ltd
AU	Adelaide University
BSS	BSES Limited
CG	CANEGROWERS
CGH	CANEGROWERS Herbert River
CGT	CANEGROWERS Tully
CHC	Clarence Cane Harvesters
CMC	Cathy McGowan Consulting
CPI	CSIRO Plant Industry
CRC	CRC for Sugar Industry Innovation through Biotechnology
CSE	CSIRO Sustainable Ecosystems
CSR	CSR Sugar Ltd
CVA	Managing Climate Variability Program
DHC	Rural R&D Corporations Developing Human Capacity Program
DPI	Queensland Department of Primary Industries and Fisheries
FMS	Farm Management Systems initiative
GGP	Grower Group Innovation Project
HGP	Harvesting Group Innovation Project
ICB	International Consortium for Sugarcane Biotechnology
IBS	Innisfail-Babinda Cane Productivity Services Limited
JCU	James Cook University
LDI	Leading Industries
MAF	Mulgrave Area Farm Integrated Action
MAS	Mossman Agricultural Services
MSA	Mackay Sugar Cooperative Association
MSF	Maryborough Sugar Factory
NSC	New South Wales Sugar Milling Cooperative Ltd.
OHS	Rural R&D Corporations Farm Health & Safety Program

ORC	Ord River Canegrowers
PCS	Plane Creek Productivity Services
QUT	Queensland University of Technology
RDA	SRDC-sponsored Awards
REL	Roberts Evaluation Limited
SRD	SRDC-Managed activities
SRI	Sugar Research Institute
STU	SRDC Student Scholarships
UNW	University of New South Wales
UQ	The University of Queensland
WAA	Western Australia Department of Agriculture
WS	SRDC Workshops
YDV	Yield Decline Joint Venture

ATTACHMENT C

ABBREVIATIONS AND ACRONYMS

ACFA	Australian Cane Farmers' Association Limited
ACGC	Australian Cane Growers' Council Limited
AOP	Annual Operational Plan
ASMC	Australian Sugar Milling Council Proprietary Limited
ASSCT	Australian Society of Sugar Cane Technologists
BPMS	Business Process Management System
BSES	BSES Limited
CAC Act	Commonwealth Authorities and Companies Act 1997
CCS	Commercial Cane Sugar
CRC	Cooperative Research Centre
CRCSIIB	CRC for Sugar Industry Innovation through Biotechnology
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HBP	Harvesting Best Practice
FMS	Farm Management Systems
GGIP	Grower Group Innovation Projects
HGIP	Harvesting Group Innovation Projects
IPM	Integrated Pest Management
NSWSMC	New South Wales Sugar Milling Cooperative
PIERD Act	Primary Industries and Energy Research and Development Act 1989
QDPI&F	Queensland Department of Primary Industries and Fisheries
R&D	Research and Development
RDC	Research and Development Corporations
RPEOI	Research Project Expression of Interest
SRDC	Sugar Research and Development Corporation
SRI	Sugar Research Institute
SYDJV	Sugar Yield Decline Joint Venture
TLOP	Travel and Learning Opportunity Project