Australian Government

Sugar Research and Development Corporation

Annual Operational Plan 2004 → 2005





Annual Operational Plan 2004–2005

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SRDC Board of Directors 2004-2005

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CONTENTS

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.

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

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 is a funding body focusing 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 providers, with the goal of maximising stakeholder returns on R&D investment.

The Australian sugar industry produces raw and refined sugar from sugarcane. While on average it produces only 3–4% of the world sugar supply, it exports approximately 8–10% of the sugar traded worldwide. While in recent years Australian sugar production has been fluctuating around 5 million tonnes per annum, depending on seasonal conditions, the gross value of cane production has been declining. After dropping below $1 billion in 1999–00, it is forecast to be $775 million in 2003–04.

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's 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.

R&D Plan 2003–2008

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

SRDC worked with sugar industry organisations, research providers 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 6.1.

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

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 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 and 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 2004–05 in relation to these consultations or for any other purpose apart from the conduct of R&D projects (see Section 4.3).

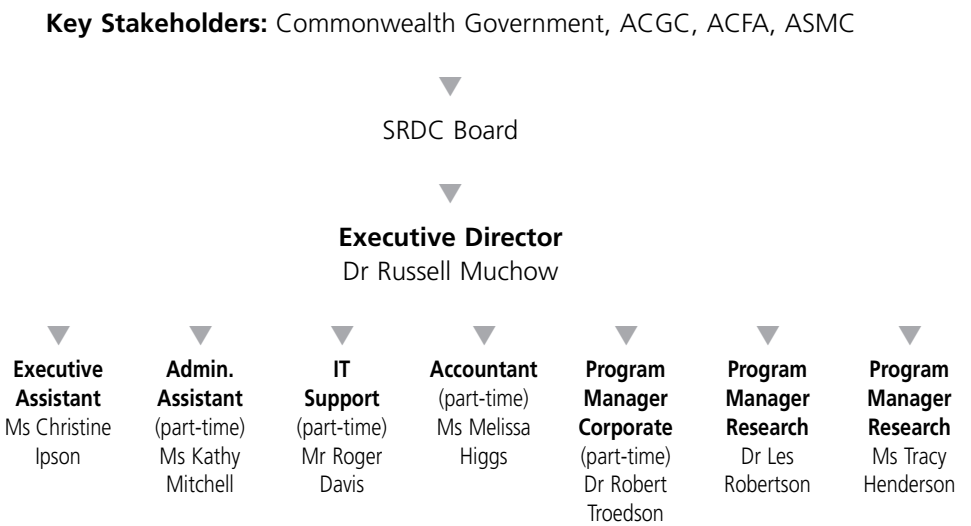
2.4 Responsible Minister — Ministerial power of direction

SRDC is responsible to the Federal Parliament through Senator the Hon. Judith Troeth, 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.

2.5 Corporate Governance Framework

2.5.1 Corporate Structure



2.5.2 Structures, processes, 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 two 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 reviews its R&D activities and management systems at its July meeting each year including a review of progress towards achieving its corporate outputs and outcome. It also considers whether the R&D Plan requires amendment. In addition, it reviews the performance of 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 its internally developed 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.

The Board at its meeting in July 2003 agreed to call for new proposals across all four Programs of the R&D Plan 2003–2008. In August 2003, SRDC advertised nationally for preliminary project proposals for funding to commence in 2004–05, with a due date of 30 September 2003. Seventy-six proposals were received. In October 2003 SRDC convened three Working Parties to consider the 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 Program Managers. In November, the Board considered the proposals and the Working Parties' assessments and agreed to invite 23 full proposals to be submitted by 14 February 2004. The Board also approved a call for Travel and Learning Proposals, due by 14 February, and 23 were received.

Following consideration of the proposals by the Working Parties and the Board in March 2004, the final portfolio of projects (including continuing projects commenced prior to 2004–05) was consolidated by SRDC for submission to the Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry in this Annual Operational Plan.

3. Operating Environment

3.1 R&D Environment

Total funds available for sugar industry R&D in 2003–04 were estimated in October 2003 to be $48.9 million, of which 36% was contributed by the industry. This total consisted of $9.9 million provided by SRDC, $26.7 million from R&D providers including the industry R&D organisations BSES, SRI and Cane Protection and Productivity Boards, and $12.3 million from other sources.

The total funding represents an increase of $2.9 million on that estimated for 2002–03. A combination of events including a low sugar price, poor seasonal conditions in some areas (resulting in lower levy payments to SRDC) and cessation of the special Australian Government funded program CP2002 in 2002–03 have resulted in a reduction in SRDC funds of approximately $5 million. The new CRC for Sugar Industry Innovation through Biotechnology, which commenced in July 2003, provided a significant boost in R&D funding of $10.2 million, although the CRC for Sustainable Sugar Production concluded in June 2003.

In this funding environment, the sugar industry and SRDC in particular face four key challenges over the next two to three years 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 does not have a substantial domestic market for a large proportion of their production. Brazil, in particular, has increased its exports ten-fold over the past six years to more than 12 million tonnes (compared with Australia's total production of 5 million tonnes) and with its low production costs, provides a new benchmark for all countries competing on the international sugar market.

- *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.

- *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 most difficult period in a decade with low sugar prices threatening industry viability. In responding to this challenge, SRDC and R&D providers 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 new 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 new 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.

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 6.

4. THE SRDC R&D PORTFOLIO

4.1 R&D Programs

The R&D Plan 2003–2008 includes four R&D Programs which are described below. This section provides an overview of the Programs and the project portfolio for 2004–05. Greater details of the projects are provided in Section 6, 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 that were approved at the time of preparation of the AOP. Additional projects, within the budget amounts proposed in Section 5, 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 2004–05

Projects to be funded in 2004–05 will target regional and cross-sector decision-making. Several initiatives target the harvest and transport interface to achieve whole-of-system gains in revenue and cost efficiency coupled to piloting processes for participative implementation of change. Market signals are being assessed to develop options for improved harvest payment systems which will promote adoption of harvesting best practice. A whole-of-industry predictive modelling capacity is being developed to assist industry to explore alternative cost-effective production systems. Improvements are being sought to yield forecasting to enhance marketing strategies for the sugar industry, which will contribute to another initiative to develop methods for industry-wide implementation of new technologies. Five projects will support partnerships and planning to enhance socio-economic and environmental performance at specific regional and mill area levels.

Strategies

The strategies addressed in 2004–05, together with the projects funded within them, are listed in Attachment A.

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 best practice 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 adoption 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 2004–05

Integrated solutions to underpin sustainable farming systems will be sought through the development and promotion of practices to restore soil health, foster integrated pest management and develop more sustainable irrigation and fertiliser management practices. These projects will also target improvements in the quality of water leaving farmlands. Several projects will promote the adoption of best management practices in new farming systems. SRDC will also invest in sugarcane plant improvement, through the CRC for Sugar Industry Innovation through Biotechnology, and through projects to develop improved varieties with pest and disease resistance and improved sugar content, through both conventional and biotechnology approaches.

Strategies

The strategies addressed in 2004–05, together with the projects funded within them, are listed in Attachment A.

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.

Significant 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 2004–05

Projects funded in 2004–05 aim to develop innovative technologies and best management practices for harvesting and milling processes. These include improved harvester design, reduced factory maintenance costs and improved evaporation and crystallisation processes in raw sugar factories. Diversification of the income stream will be expanded through initiatives aimed at improving cogeneration of electricity through improved drying of trash and bagasse and other sources of increased energy efficiency. As well, extraction of natural products from sugarcane, and extraction and fermentation technologies which can lead to improved processes for production of food products and feedstocks such as ethanol, will be investigated through projects in the CRC for Sugar Industry Innovation through Biotechnology.

Strategies

The strategies addressed in 2004–05, together with the projects funded within them, are listed in Attachment A.

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 2004–05

Projects to enhance people's capacity to learn and change in 2004–05 include the development of corporate governance skills in rural women and the ongoing development of industry leadership skills through Continuous Improvement and Innovation workshops and Industry Capacity Building Program in partnership with CSR Sugar. In addition, SRDC will fund 14 postgraduate scholarships at a number of Australian universities, and continue to support the joint RDC programs in farm Occupational Health and Safety and Human Capacity Development. SRDC will also participate in the Innovator of the Year Award (with Queensland Sugar Limited) and will offer the SRDC Research/Extension and Service to Industry R&D Awards. SRDC will participate with the Department of Agriculture, Fisheries and Forestry in offering a sugar industry award as part of the *Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry.*

SRDC will support 15 Travel and Learning Opportunity Projects which will enable industry, research and extension staff to visit other regions or industries or national and international conferences. These projects provide people with the opportunity to learn new and improved approaches to commercial or R&D activities through observing and discussing the work of others.

Strategies

The strategies addressed in 2004–05 together with the projects funded within them, are listed in Attachment A.

4.2 Allocation of Resources among Programs

The R&D Plan 2003–2008 provides a target allocation of resources between programs, which is compared to the proposed allocation for 2004–05 in Table 1. The proposed allocations in 2004–05 are within the target ranges in all programs except Program C. In difficult times and with limited resources, SRDC believes that greater short-term gains in industry performance are available through integrating existing knowledge and building capacity towards whole-of-system solutions than are available through new R&D investment into component research. This thinking is reflected in the allocation of resources in Programs A, B and D near to the top of the target ranges. A key outcome of this targeted investment will be a reliable, increasing and cost-efficient cane supply. This is also one of the most critical needs of mills in the present environment, and which explains the below-target allocation to Program C.

TABLE 1 TARGET ALLOCATION OF RESOURCES ACROSS PROGRAMS AND PROPOSED ALLOCATION FOR 2004–05

Program (Output)	Target Allocation in R&D Plan (%)	Total Funding 2004–05 ($m)	Allocation 2004–05 (%)
A (1) Value Chain Integration	20–25	2.163	23
B (2) Farming Systems	45–50	4.679	50
C (3) Processing and Distribution Systems	15–20	1.175	13
D (4) Industry Capacity	10–15	1.303	14
Total		9.320	100

4.3 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.

In 2004–05, regional offices of the Australian Cane Growers' Council will act as administering organisations for one research project and two travel and learning projects.

Project CG004, *Adopting systems approaches to water and nutrient management for future cane production in the Burdekin*, will be administered by Burdekin Canegrowers and conducted in partnership with researchers in BSES Limited, CSIRO and CSR Sugar. The project will develop, promote and implement best irrigation practices across the Burdekin, using groups of growers who will evaluate the economic and environmental benefits. The project will result in more precise irrigation application, which will reduce the loss of nutrients to run-off and groundwater, and will lower the risk of rising water-tables and a subsequent increase in salinity.

Project CG005, *Value adding and diversification learning tour for Maryborough sugarcane growers*, will be administered by Maryborough Canegrowers and managed jointly with BSES Limited and the Maryborough Cane Protection and Productivity Board. Forty-five growers and advisers from the Maryborough region will travel to the Darling Downs, Kingaroy, Rocky Point and Brisbane to build capacity in diversification options, occupational health and safety management, business management and systems analysis skills. Lessons will be derived from the dairy, beef, small crops and horticultural industries to improve performance on Maryborough district farms.

Project CG006, *Study tour of the Brazilian sugar industry*, will be administered by Babinda Canegrowers. Six young growers from North Queensland will travel overseas to study and learn from the Brazilian sugar industry. Participants will focus on learning about Brazilian farming systems, harvest and transport systems, ethanol and other alternative products, and social and environmental issues. The project will contribute to the development of a capable, knowledgeable and skilled younger generation of sugar industry participants.

5. Outcomes, Outputs and Resourcing

5.1 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 agricultural, 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 6.

5.2 SRDC Outputs

The R&D Plan 2003–2008 specifies four outputs which match the four Programs. Figure 1 shows the contribution of the four outputs to SRDC's overall outcome in 2004–05.

Figure 1 — Relationship between Outcomes, Outputs and Inputs in 2004–05

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 From Independent Sources: $9.367m
Total Cost of Outputs: $9.320m

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: $2.163m (04–05) $1.988m (03–04)	**Total Cost: $4.679m (04–05) $4.953m (03–04)**	**Total Cost: $1.175m (04-05) $1.594m (03-04)**	**Total Cost: $1.303m (04-05) $1.368m (03-04)**

5.3 *Outcome — Resourcing*

The total revenue for SRDC including industry levies and the Commonwealth contribution, and total expenditure for the SRDC outcome are shown in Table 2 along with comparable figures from the 2003–04 AOP.

TABLE 2 2004–05 SRDC BUDGET

	$m 2003–04	**$m 2004–05**
Estimated Crop Size (cane)	36.3 mt	36.8 mt
Levy rate/tonne	$0.14	$0.14
INCOME		
Industry Contribution	5.079	5.152
Commonwealth Contribution	4.800	3.945
Interest / Other	0.160	0.270
TOTAL INCOME	**10.045**	**9.367**
EXPENDITURE		
Continuing Projects	5.453	4.669
New Projects	2.454	2.550
Subtotal		
Contingency for Projects	0.300	0.600
TOTAL PROJECTS	**8.207**	**7.819**
Research Administration	0.469	*
Operation of SRDC	1.168	1.486
Capital	0.059	0.015
TOTAL EXPENDITURE	**9.903**	**9.302**

* From 2004–05 Research Administration is included in Operation of SRDC

5.4 Performance Information for Outcome and Outputs

The effectiveness of SRDC's R&D programs in achieving its overall outcome is assessed by the indicators given in Table 3.

TABLE 3 PERFORMANCE INDICATORS AND MEASURES FOR THE EFFECTIVENESS OF SRDC'S ACTIVITIES IN ACHIEVING ITS OUTCOME

Performance information for SRDC Outcome — Effectiveness	
Indicator	**Measure**
1. Economic returns from SRDC investments	1(a) Investment analyses of completed R&D projects demonstrate a benefit:cost ratio greater than 5:1 1(b) Adoption rates benchmarked for at least three technologies per year
2. Environmental returns from a better understanding of environmental management issues, and a reduction of adverse impacts on the industry's production environment and other ecosystems	2. Case studies demonstrating improved 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; and R&D with significant community benefits	3(a) Case studies demonstrating improved health and safety 3(b) Completion of at least two tertiary scholarships and two study tours or conference attendances by industry R&D personnel per year 3(c) The number of producers involved in participative action research increasing each year 3(d) The proportion of total SRDC funding that contributes benefits beyond the sugar industry exceeds 30% 3(e) The proportion of total SRDC funding that contributes significant benefits to rural and regional communities exceeds 20%
4. Alignment of SRDC's priorities and plans with those of the Australian sugar industry and the Australian Government	4. Outputs produced in all sugar industry and government priority areas
5. Compliance with statutory obligations	5. Submission of statutory documents on time and meeting all requirements, as measured by acceptance by the Minister

Performance Information for SRDC's four Outputs in 2004–05 is presented in Table 4.

TABLE 4 PERFORMANCE INFORMATION FOR SRDC OUTPUTS

Output	**Indicator and Measure**
Common to Outputs 1, 2, 3 & 4	*Quality*: • Accountability to SRDC of its research providers through monitoring project milestones, financial reporting requirements and reviews to ensure delivery of output • At least one review completed in each Output.
Specific to individual outputs	
Output 1 — Whole-of-system solutions based on integrated management of the value chain, particularly at mill area and regional levels	*Quantity*: 2 new and 10 continuing contracts (projects) *Price*: Average of $180,330 per project
Output 2 — Sustainable sugarcane production systems based on integrated management of resources at farm level.	*Quantity*: 8 new and 18 continuing contracts (projects) *Price*: Average of $179,960 per project
Output 3 — Flexible, cost-effective systems for sustainable harvest, transport, milling and marketing based on innovative design.	*Quantity*: 4 new and 9 continuing contracts (projects) *Price*: Average of $90,385 per project
Output 4 — Enhanced human capacity for change, learning and innovation in the sugar industry.	*Quantity*: 16 new and 11 continuing contracts (projects) and 3 new and 11 continuing scholarships *Price*: Average of $40,710 per project and an average of $14,270 per scholarship

6. Addressing Targeted Outcomes and Stakeholder Priorities

6.1 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
- An *effective R&D capability* underpinning industry futures.

6.2 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
- 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
- Protecting Australia from invasive diseases and pests
- Creating an innovative culture

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

This section outlines SRDC's planned investment activities in 2004–05 using the six key outcomes of the SRDC R&D Plan as 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.

Outcome 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

Enhancing cane supply is one of the keys to profitability in the sugar industry through maximising returns per unit of costs. This has become more critical in recent years due to lower prices and the impact of drought, disease and alternative land uses on sugarcane production. Whilst acknowledging the economic imperatives, farming practices also need to minimise impacts on the environment and other ecosystems. This requires integrating different elements (including varieties, water and nutrient inputs, pest management and timely operations) into a workable and robust package. 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 this outcome. Those that focus on sustainable water and nutrient management in sugarcane farming systems address both economic and environmental outcomes. However for ease of presentation they will be discussed under Outcome 3, which focuses on environmental sustainability. In practice SRDC views all aspects of farming systems R&D as elements that must be integrated into the whole, and all address the **National R&D Priority** of ***An environmentally sustainable Australia*** and the complementary **Rural R&D Priority** of ***Sustainable natural resource management***.

SRDC's major farming systems investment has been through the Sugar Yield Decline Joint Venture (SYDJV) which commenced in 1993. The SYDJV has designed and verified the benefits of a new 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. A series of long-term rotation experiments will conclude in 2004–05 and there will be a strong emphasis on data analysis, communication and implementation of findings. In a related project, evaluation of new soybean varieties will continue. Several of those varieties are showing higher yields than current varieties and appear to be well-adapted and high yielding from south Queensland through to the Burdekin and Tablelands, as well as being well adapted to the dry season in the far north.

One new project in 2004–05 will boost implementation of the new farming system (minimum tillage, controlled traffic, trash blanketing and legume rotation crops) in the Central district. Groups of growers will cooperatively develop the system to suit local conditions and demonstrate economic and environmental benefits.

This will complement a project which will conclude in 2004–05 which has been collaborating with the BSES PROSPER program to ensure that the momentum of grower groups developed

in SRDC's CP2002 program is maintained. That project has promoted participative involvement by growers and a systems approach to best management practice in which all practices are evaluated for triple bottom line benefits. Surveys have demonstrated that growers who have participated in implementation of change through group processes have seen benefits in profitability. The project will be reviewed in June 2004 to ensure that learnings can be translated to new projects and to other productivity initiatives underway in the industry.

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 a new project will develop means to integrate control of greyback and Childers canegrub into the new farming system 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.

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 will be significantly expanded in 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. Another project in collaboration with the CRC for Tropical Plant Protection will continue to study genetic diversity in strains of the sugarcane smut fungus from south-east Asia, to estimate the risk of new strains appearing and the need for broader screening of resistant varieties.

SRDC is also continuing to support efforts to minimise the impact of existing pests and diseases. A project investigating reliable means to screen for Fiji Leaf Gall (FLG, formerly Fiji Disease Virus) will conclude in 2004–05 and is showing considerable promise after years of frustration at getting poor expression of the disease in trials. The new screening method involves growing plants in pots for 4–5 months, exposing them to infective leafhoppers in a glasshouse for two weeks, and planting them out in the field. This method is providing reliable and consistent disease ratings for new varieties and is likely to be adopted across the entire breeding program.

Managing the impacts of climate variability is an important factor in enhancing the robustness of sugarcane farming systems. SRDC is a partner in the newly-established joint RDC Managing Climate Variability Program which will commission its first projects in 2004–05. 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.

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. SRDC is continuing to invest in R&D for genetic improvement, but 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.

The SRDC R&D Plan targets closer integration of conventional and biotechnological approaches to the breeding of sugarcane varieties. Continuing projects in 2004–05 will address both improved breeding and selection methodologies, and breeding for elite traits, including increased sugar content and resistance to pests and diseases.

A new project will develop 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***.

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 CRC will build on the foundation of biotechnology R&D in the sugar industry which has been strongly supported by SRDC over several years. SRDC funding has supported the development of enabling technologies in transformation, genomics, and molecular markers, and identification of genes for insect and disease resistance, and improved sugar content. In 2004–05 SRDC will support initiatives in the development of gene control sequences, the application of molecular markers to sugarcane breeding, the introgression of new genes from *Saccharum officinarum*, and the use of the sugarcane plant as a biofactory for biopolymers and for production of sucrose derivatives.

SRDC also supports several projects through the International Consortium for Sugarcane Biotechnology, which are focussing on gene discovery and enabling technologies relevant

to sugarcane biotechnology worldwide. The CRCSIIB will take over this role from SRDC in 2004–05, but SRDC will continue to support existing projects on the development of gene maps in sugarcane.

Outcome 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

SRDC's investments towards this outcome also address the **Rural R&D Priority** of ***Improving competitiveness through a whole of industry approach***.

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. This Program was given substantially increased funding over the life of the Plan compared to the previous Plan period. Some of SRDC's investments in **Program C**, **Processing and Distribution Systems**, are also directed towards this outcome.

Several continuing projects in 2004–05 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. One project is developing a whole-of-industry predictive modelling capacity which will assist industry to explore alternative cost-effective production systems. This project will integrate expertise and models developed separately for the farming and milling sectors of the industry. The models will enable the industry to explore the consequences of adopting new ventures in a mill region, commencing with pilot studies investigating whole crop harvesting for co-generation, inter-mill cane transfers and whole-of-system impacts of green cane harvesting in the Burdekin.

A major thrust towards this outcome is R&D on whole-of-system impacts of alternative cane supply management systems. Several projects are building on previous work which identified the potential for sustainable economic improvements by redesigning harvest and transport scheduling using systems modelling tools. These projects are applying these tools in case study mill areas, and developing new models to integrate 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. Another project is adding a financial interface and road modelling capacity to the main transport model.

Several projects will focus on improving the efficiency of harvesting. An SRDC-sponsored Harvesting Forum in 2003 concluded that the current payment method for harvesting and the lack of incentives for cane quality were hindering the adoption of best practice harvesting. A key initiative which commenced in 2003–04 is assessing market signals related to harvesting best practice, and developing options for improved payment systems, which will provide incentives for growers, harvesters and millers to negotiate improved economic, environmental and social outcomes.

Two new projects in 2004–05 will also focus on improved efficiencies in harvest and transport. One project based in NSW will seek 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. The other 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.

Several projects are seeking cost and energy efficiencies in factory and storage processes, which will lead to enhanced stream and energy generation from bagasse. Other aspects of improved sugar quality will also be addressed through improvements to factory-based processes for juice separation, clarification, evaporation and crystallisation which lead to cost efficiencies in these processes.

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 Mackay, a "cooperative systems" model is being developed to integrate the links of the value chain in order to add value to its component parts and enhance decision making and, ultimately, to increase regional industry revenue. A pilot program will be conducted in 2004–05 to test implementation of the model. In NSW, an industry system based around whole of crop harvesting to support cogeneration will be evaluated, which will necessitate modified farming, harvesting, transport and milling systems and will contribute to renewable energy production.

A new project in 2004–05 will examine options for extended season length in the Herbert. Potentially, benefits worth $5 million per annum could be realised in the Herbert region through improved utilisation of capital, improved efficiency of harvester scheduling, and improved ratoon performance. The project seeks to demonstrate how similar benefits could be achieved in other regions through the adoption of principles established in the Herbert study. In Tully, SRDC will provide facilitation resources to enable the industry to implement plans developed in the regional vision and planning process conducted in 2003–04, to enhance regional sustainability.

SRDC has contributed to a series of studies to support Australia's role in international trade negotiations, which address the **Rural R&D Priority** of ***Improved trade and market access***. In 2003–04, SRDC supported a study jointly funded by the sugar industries of Australia, Brazil and Thailand, to contribute to the World Trade Organisation Doha Round of negotiations. No further studies are planned in 2004–05 but SRDC will remain responsive to the need for R&D to support the position of the Australian sugar industry in trade negotiations.

One continuing study in 2004–05 will support more effective marketing of Australian sugar through improved yield forecasting. The project is developing an enhanced yield forecasting system through the integration of climate forecasting, remote sensing and crop modelling approaches. Improved yield estimates improve the marketers' capacity to obtain premium prices through forward sales.

Outcome 3: *Demonstration of environmental sustainability* to the satisfaction of all stakeholders

SRDC's investments towards this outcome directly address the **National R&D Priority** of ***An environmentally sustainable Australia*** and the complementary **Rural R&D Priority** of ***Sustainable natural resource management***.

Sustainable use and management of natural resources is a key focus of the SRDC R&D Plan 2003–2008 in the context of delivering triple bottom line benefits to the sugar industry and the Australian community.

In 2003–04 SRDC conducted and published the proceedings of a workshop on *Cane Farming to Improve Water Quality*. This workshop identified current best practice to minimise the impact of the sugar industry on waterways including the Great Barrier Reef lagoon. The findings have contributed to several new initiatives for 2004–05, which target more efficient utilisation of water and nutrient resources and improved quality of water leaving canelands. Together, the new and continuing activities in SRDC's portfolio will assist the industry and the Australian community to address the strategies, priorities and targets in the Australian and Queensland Governments' *Reef Water Quality Protection Plan* of October 2003.

A new project in the Burdekin will develop, promote and implement best irrigation practices using 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.

Another new 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.

Two continuing projects will focus 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 reduces irrigation costs and the risks of rising water tables, salinity, and loss of nutrients to groundwater.

Two new projects in 2004–05 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. A previous SRDC-funded review of nitrogen fertiliser R&D in the Australian sugar industry led to 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. This hypothesis is supported by modelling studies and will be further evaluated in field trials. The second project will extend previous studies in the Herbert and Bundaberg areas that targeted nutrient recommendations to knowledge of nutrient supply characteristics of different soil types. The two projects will be closely integrated and will jointly conduct an annual industry workshop to promote adoption of outputs. Both projects are expected to result in better targeted fertiliser application, lower costs and reduced nutrient losses in off-farm water flows, while maintaining or enhancing sugar yields.

Mill mud returned to sugarcane fields can be a valuable source of nutrients but its use tends to be confined to farms near the mill because of the high costs of transport. Regular applications

to the same fields increases the risks of build-up of heavy metals and loss of nutrients to groundwater. One continuing project is examining ways of reducing the water content through filtering or centrifuging, which would enable cost-effective transport to farms more distant from the mill.

This outcome also addresses the **National R&D Priority** of ***Promoting and maintaining good health***. The primary focus for SRDC investment has been in workplace health and safety. SRDC will continue to participate in the joint RDC program on Farm Health and Safety which runs until 2005–06. One project in this program has examined health and safety issues on sugarcane farms, and the recommendations of that project will be promoted. 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.

One new project in 2004–05 is building on previous research which investigated an improved surface for mill rollers. The grooved surfaces of rolls used for milling prepared cane have a high rate of wear and require regular arc welding to re-build the tips of the grooves. Avoiding the arc-welding, which produces chromium fumes, will significantly improve the health and safety conditions of mill workers. The experimental roll shell surface is composed of a more durable iron material and tungsten hard-facing on the groove tips. It will result in cost savings to mills in addition to the workplace health and safety benefits.

This outcome 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 pest management will generally lead to reduced use of pesticides. IPM for canegrubs (discussed under Outcome 1) can involve replacement of chemical insecticides with the commercial biological control product BioCane, which is based on the Metarhizium fungus. These initiatives will be promoted in 2004–05 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.

Outcome 4: *Diversification of the income stream* from products derived from sugarcane

The main avenues of diversification being currently pursued in SRDC's portfolio are electricity generation by mills and alternative products under investigation through the CRC for Sugar Industry Innovation through Biotechnology (CRCSIIB). Much of this R&D is also relevant to Outcomes 1 and 2, and has been discussed in that context. This work addresses the complementary **National and Rural R&D Priorities** of ***Using frontier technologies for building and transforming Australian industries*** and the **Rural R&D Priority** of ***Improving competitiveness through a whole of industry approach***.

Projects supporting an enhanced revenue stream through cogeneration are focussing on drying bagasse and trash to improve their energy efficiency. One new project in 2004–05 will examine low-cost ways of storing bagasse and cane trash that promotes the drying of these materials

under prevailing storage conditions. Other projects discussed under Outcomes 1 and 2 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.

Outcome 5: *Enhancement of human capacity and partnerships* between industry, research and regional communities to underpin change, learning and innovation

This Outcome addresses the **Rural R&D Priority** of ***Creating an innovative culture***.

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.

Initiatives commenced in 2003–04 to support leadership development programs will continue in 2004–05. The Industry Capacity Building program conducted in collaboration with CSR Sugar Ltd will be expanded to target additional personnel both within and outside the CSR mill areas. Participants in the current four programs come from the farming, harvesting, milling, marketing, representational and R&D sectors of the industry. Two of the four programs will conclude in 2003–04 and the other two will conclude in 2004–05. SRDC, in partnership with CSR, will sponsor a fifth program to be conducted in 2004–05. SRDC will also sponsor two further Continuous Improvement and Innovation workshops facilitated by experienced QDPI personnel to deliver principles, processes and tools of continuous improvement and innovation, particularly to industry service providers in the northern and southern mill areas. Participants will be supported in conducting a specific learning activity over the following 12 months, which will focus on implementation of change in the context of their own job responsibilities.

A new initiative in 2004–05 will be the conduct of a cultural imprint analysis in the Herbert. The cultural imprint analysis will involve collecting a range of "stories" that describe the way the community works or doesn't work together. The process will include a diverse range of participants from all sectors of the sugar industry and will draw on the expertise of several consultants with expertise in cultural analysis for numerous agricultural industries. 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 is expected to eventually lead to economic, social and environmental benefits to the region through improved communication and engagement among stakeholders.

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 will demonstrate the benefits from, and identify means of achieving, broad adoption of new technologies. Two other projects to assist the delivery of factory technology developed by SRI are also continuing. They aim to increase the capability of sugar mill staff to plan and control factory processes by providing troubleshooting/help manuals and making SRI modelling software accessible via the SRI web site. A new web-based information system portal will be incorporated into the SRI web pages.

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*.

SRDC strongly promoted its call for Travel and Learning Opportunity proposals for 2004–05. While not excluding traditional travel by researchers to workshops and conferences, SRDC targeted capacity building in industry personnel through travel or through exposure to resource people visiting their regions. Of the 15 Travel and Learning Opportunity Projects funded in 2004–05, nine provide opportunities for industry personnel to learn new and different ways of doing things through visiting other regions and/or industries. Two of the projects will focus on women in the industry and two will focus on young people, to address SRDC's goal of building capacity by harnessing the total resources available to the industry. Each Project will incorporate an appropriate communication strategy to ensure that benefits are communicated to the broader industry.

Fifty growers from the Innisfail-Babinda region will participate in a two-day bus trip to the Herbert and Burdekin areas and will be hosted by advisors from the Herbert and Burdekin. The focus of the tour will be how to remain sustainable in a low sugar price environment. The growers will examine the roles of strategic and minimum till, legume use, rotation cropping, and fertiliser regimes in sustainable, profitable farming systems.

Forty-five growers and advisers from the Maryborough region will travel to the Darling Downs, Kingaroy, Rocky Point and Brisbane to build capacity in diversification options, occupational health and safety management, business management and systems analysis skills. Lessons will be derived from the dairy, beef, small crops and horticultural industries. The growers on the trip will communicate their experiences through various means, including the presentation of a poster at the 2005 conference of the Australian Society of Sugar Cane Technologists (ASSCT).

Twenty Burdekin growers will also be "on the road" in 2004–05 to increase their ability to implement sustainable farming systems, grower groups, and cooperative business models and structures. They will travel to Mackay, Bundaberg, the Darling Downs and Emerald. This project was initiated by the Burdekin growers themselves who have recognised the need for significant change in order for the sugar industry to be sustainable.

Eight NSW growers and four extension officers will travel to Victoria to visit members of the Birchip Group, which is a farmer-initiated and managed R&D group which has contributed significant economic, environmental and social benefits to the members of the group. The sugar industry travellers will study the operation of the Birchip group with a focus on their R&D into controlled traffic and reduced tillage.

The Bundaberg Women in Sugar Group was founded in 2000, and 20 women from this group will be travelling in 2004–05 to learn from the cotton industry in Narrabri, NSW. This trip aims to build capacity among the participants in a range of areas including analysis skills and farming systems skills. Lessons from the experience will be shared with others in the sugar industry via presentations, and a poster summarising the experience will be presented at the 2005 ASSCT Conference.

A network for communication among growers has been recently established in the Mackay region, and 33 growers who are leaders within the network will travel to learn about farming systems, action learning, and controlled traffic. A unique feature of this bus trip to the Burdekin (sugar) and Dysart (grain) regions is that two experts from other agricultural industries will be accompanying the growers and BSES extension staff on the three-day bus trip to expose the growers to new ways of thinking and to facilitate dialogue and discussion among participants. This project will deliver improved understanding of technical concepts, and will lead to improved group coordination and transfer of information skills among the participants.

Several women from the Developing Education with Focus on Sugar (DEFOS) group in the Herbert will travel to Warwick to attend the 2004 Queensland Women's Rural Network Conference. The focus of this trip is to build facilitation and financial management skills, and to learn from the experiences of rural women in other agricultural sectors.

A group of 14 young farmers from the Central district will travel with a young BSES Best Management Practice Officer to the Northern sugar industry to learn about alternative farming systems and water quality issues and improve their understanding of environmental issues and rotation crops. The four-day trip will expose the farmers to a range of researchers and growers in the Northern region.

Finally six young growers from North Queensland will travel overseas to study and learn from the Australian sugar industry's number one competitor — Brazil. Participants will focus on learning about Brazilian harvest and transport systems, ethanol and other alternative products, farming systems and social/environmental considerations. The future of the Australian sugar industry depends on a capable, knowledgeable and skilled younger generation and this project aims to build the capacity of six young sugar industry people to contribute to that future.

Outcome 6: An *effective R&D capability* underpinning industry futures

This Outcome is also a focus of Program D and addresses the **Rural R&D Priority** of ***Creating an innovative culture***. Within Program D, SRDC seeks to promote more effective coordination of R&D activities across industry and R&D providers, to enhance the performance of the R&D system through evaluation, review and feedback, and to encourage a broad range of R&D providers. SRDC wishes to facilitate enhanced skills in R&D personnel.

SRDC requires all R&D project proponents to nominate in their proposals the means they will use to implement change and deliver project outcomes. SRDC conducts workshops annually in December to assist investigators who have been invited to submit full proposals to integrate adoption and evaluation into project design. This process is intended to also build capacity in investigators through developing an ethos of, and skills in, evaluation.

Industry participation in SRDC's Travel and Learning Opportunity projects was described in Outcome 5. The remaining six Travel and Learning Opportunity projects in 2004–05 target increased capacity among researchers and advisers. These projects will also incorporate an appropriate communication strategy to ensure that benefits are communicated to the broader industry.

Enhanced capacity among the milling sector to conduct *needs analysis* will result from a project involving SRI staff Mr Geoff Kent and Dr Ross Broadfoot and Mr Richard Clark from QDPI. Needs analysis workshops will be facilitated by SRI staff for each of the four North Queensland milling companies — Mossman Central Mill, Mulgrave Central Mill, Bundaberg Sugar and Tully Sugar. The project will also identify priority research needs to guide future investment decisions.

BSES researchers will travel with Northwatch and QDPI staff to deliver training in key potential sugar industry pests and diseases to operational quarantine staff in North Queensland. The project will increase the capacity of quarantine staff to minimize the possibility of an introduction of a cane pest or disease into Australia. A field manual of key pests and diseases in South East Asia and Papua New Guinea will be produced and distributed to AQIS, QDPI, Northwatch, Sugarcane Agricultural Service Groups, regional mills, BSES extension officers and Canegrowers offices in North Queensland.

The International Society of Sugar Cane Technologists (ISSCT) triennial conference is the most comprehensive international meeting for sugar researchers. Rick Beattie from NSWSMC and NSW grower Robert Quirk will present a paper on sugarcane production on acid sulphate soils to the 2005 Conference in Guatemala and will travel on to Brazil to investigate cogeneration and environmental management activities. Senior BSES extension officer Peter McGuire will also attend the ISSCT Conference followed by a visit to the Louisiana sugar industry to investigate frost management and controlled traffic.

Dr Anne Rae of CSIRO Plant Industry and the CRCSIIB will participate in the International Workshop on Plant Membrane Biology in Montpellier, France, in July 2004. Dr Rae will present her research findings and learn from presentations and discussions with other researchers working on plant membrane biology. The ultimate outcome is that Dr Rae's work will contribute to the development of sugarcane varieties with higher sugar content.

SRDC postgraduate scholar Kimberly Ritter will travel to the Plant and Animal Genome Conference in San Diego, California, USA in January 2005 to present her research findings and learn from others in the international arena working on related topics. Ms Ritter's greater understanding of sugarcane genetics will also contribute to the production of varieties with increased sugar content.

SRDC will continue its postgraduate scholarship program in 2004–05. Eleven continuing postgraduate scholars are studying in a range of disciplines including plant breeding and biotechnology, insect and rodent pest management, nitrogen management and water quality in sugar catchments, environmental codes of practice, and harvester design. Four of these are expected to conclude in 2004–05 and three new scholarships will be offered. SRDC will also participate in the Innovator of the Year Award (with Queensland Sugar Limited) and will offer the SRDC Research/Extension and Service to Industry R&D Awards, which 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.

ATTACHMENT A

PROJECTS AND SCHOLARSHIPS IN 2004–05

Project	Title	Duration	Contact	Funds 2004–05
Program A	**Value Chain Integration**			
Strategy A1	***Develop knowledge, technologies and implementation processes to optimise the use of whole-of-system resources***			
Continuing Projects				
CSE004	Improving yield forecasting capability to enhance market strategies for the Australian sugar industry	Sep-02–Sep-05	Dr Yvette Everingham	$112,186
CVA002	Managing Climate Variability Program	Sep-03–Sep-07	Dr Barry White	$40,000
MAS001	A regional partnership approach to developing a sustainable sugar cane system	Jul-03–Sep-07	Mr Allan Rudd	$77,842
MSA003	A cooperative systems model for the Mackay regional sugar industry	Jul-03–May-05	Mr Geoffrey Fleming	$90,000
NSC005	Implementing an integrated sugar system in NSW	Jul-03–May-06	Mr Rick Beattie	$76,000
New Projects				
BSS264	Adoption of an optimal season length for increased industry profitability	Jul-04–May-07	Mr Lawrence DiBella	$85,001
Strategy A2	***Facilitate sustainable whole-of-system change using a cooperative approach across the industry value chain***			
Continuing Projects				
BSS261	Measurement and feedback systems for improving market signals for harvesting	Jul-03–Sep-05	Mr Trevor Willcox	$144,207
CSE003	Adoption pathways for alternative cane supply options across the sugar industry	Jul-02–Jul-05	Dr Andrew Higgins	$67,842
CSE005	Integrating and optimising farm-to-mill decisions to maximise industry profitability	Jul-02–Jul-06	Dr Andrew Higgins	$172,657
CSE009	Moving from case studies to whole of industry: Implementing methods for wider industry adoption	Jul-03–Aug-07	Dr Yvette Everingham	$201,238
CSE010	Integrated value chain scenarios for enhanced mill region profitability	Jul-03–Sep-05	Dr Peter Thorburn	$300,870

Project	Title	Duration	Contact	Funds 2004–05
New Projects				
NSC006	Achieving world's best practice harvesting and transport costs for the NSW sugar industry	Jul-04–May-07	Mr Rick Beattie	$125,569
Total for Program A				**$1,493,412**

Program B Farming Systems

Strategy B1 Develop knowledge, technologies and implementation processes to underpin sustainable farming systems

Continuing Projects				
BSS202	Resource assessment for sustainable land development and management of new canegrowing areas	Jan-99–Sep-04	Dr Andrew Wood	$45,592
BSS260	Enhanced delivery of PROSPER to achieve adoption of Best Management Practices in the Queensland sugar industry	Dec-02–Aug-05	Mr Eoin Wallis	$150,000
CPI005	Adapting soybean for profitable rotations in sugarcane farming systems	Jul-02–Sep-05	Dr Andrew James	$40,000
CSE001	Increased profitability and water use efficiency through best use of limited water under supplementary irrigation	Sep-00–Sep-05	Dr G Inman-Bamber	$92,660
CSE007	Implementation of irrigation practices for profitable resource efficient sugarcane production in the Ord	Sep-02–Sep-06	Dr G Inman-Bamber	$112,342
New Projects				
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	$54,050

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				
BSS250	Improving selection systems and data analysis in sugarcane breeding programs	Jul-00–Jan-06	Dr Xianming Wei	$124,697
BSS255	Improving the plant breeding selection system for Fiji disease resistance	Jul-02–Dec-05	Mr Barry Croft	$54,808
BSS256	Reducing the Australian sugar industry's genetic vulnerability to sugarcane smut	Jul-02–Apr-07	Mr Barry Croft	$87,130

Project	Title	Duration	Contact	Funds 2004–05
BSS258	Assessing the impact that pathogen variation has on the sugarcane breeding program	Jul-02–May-05	Dr Kathy Braithwaite	$9,000
CRC002	Application of molecular markers to sugarcane breeding	Aug-04–Jun-08	Dr Phillip Jackson	$260,000
CTA028	Evaluation and re-structuring of regional selection programs to maximise efficiency and speed of cultivar release	Jul-97–Jul-04	Dr Scott Chapman	$44,097
CTA047	Introgression of new genes from Saccharum officinarum	Jul-99–Jul-04	Dr Phillip Jackson	$13,808
ICB008	A sugarcane gene map	Jul-01–Jul-04	Dr Robert Troedson	$15,000
ICB009	Map-based cloning of a rust resistance gene in sugarcane	Jul-02–Oct-05	Dr Angelique D'Hont	$0
ICB010	Validation of single nucleotide polymorphisms (SNPs) in sugarcane ESTs as useful genetic markers	Jul-03–Jul-04	Professor Robert Henry	$2,350
UQ039	Gene control sequences for metabolic engineering in sugarcane	Jul-02–Feb-06	Dr Robert Birch	$100,000
New Projects				
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	$40,465
BSS267	Maximising whole-of-industry benefits from the Australian sugarcane improvement program through an optimal genetic evaluation system	Jul-04–May-07	Dr Xianming Wei	$250,000

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–Jul-06	Dr Peter Samson	$141,536
YDV002	Sugar Yield Decline Joint Venture (Phase 2)	Jul-99–Jun-05	Dr Alan Garside	$609,143
New Projects				
BSS266	Optimum canegrub management within new sustainable cropping systems	Jul-04–Mar-09	Dr Peter Samson	$149,925

Project	Title	Duration	Contact	Funds 2004–05
BSS268	Accelerated adoption of best-practice nutrient management	Jul-04–Sep-07	Dr Bernard Schroeder	$75,000
BSS269	A new cropping system for the Central District	Jul-04–Oct-08	Mr Chris Aylward	$150,000
CG004	Adopting systems approaches to water and nutrient management for future cane production in the Burdekin	Jul-04–May-08	Mr Robert Cocco	$220,343
CSE011	Improved environmental outcomes and profitability through innovative management of nitrogen	Jul-04–Jun-08	Dr Peter Thorburn	$258,000
Total for Program B				**$3,099,946**

Program C Processing and Distribution Systems

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

Continuing Projects

SRI122	The functional relationship between juice properties, operating conditions and heat transfer in Roberts evaporators	Jul-02–May-05	Dr Darrin Stephens	$50,000
SRI123	Crystallisation studies in a pilot batch vacuum pan	Jul-02–May-05	Dr Ross Broadfoot	$120,000
SRI132	The application of microwave sensors to cane quality assessment and bagasse moisture measurement	Jul-03–Sep-04	Dr Les Edye	$12,573
SRI133	Reduced cane analysis costs via on-line analysis of first-expressed juice	Aug-03–Sep-04	Dr Austin Schultz	$25,098
SRI134	Low moisture mill mud for more cost effective return to cane fields	Jul-03–Sep-04	Mr Rod Steindl	$11,262
SRI135	Adding a financial interface and road modelling capability to the TOTools suite of programs	Sep-03–Dec-04	Dr Matt Schembri	$10,000

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

SRI107	Improved transfer to mills of technology developed by the Sugar Research Institute	Jul-00–Aug-04	Dr Graeme Bullock	$19,352

Project	Title	Duration	Contact	Funds 2004–05
New Projects				
BSS270	Regional adoption of alternative harvester configurations for sustainable harvesting efficiency	Jul-04–Sep-07	Mr Rodney Davis	$75,000
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	$110,423
SRI137	Factory trial of modified long life roll shell surface	Jul-04–May-06	Dr Gaye Davy	$116,165
SRI138	Increase the energy efficiency and revenue of sugar factories	Jul-04–Jun-05	Dr Ross Broadfoot	$99,742
Strategy C3	***Diversify the income stream from the products of sugarcane, primarily by broadening the product base***			
Continuing Projects				
CRC003	Use of sugarcane as a biofactory for production of biopolymers	Apr-04–May-08	Dr Stevens Brumbley	$184,375
CRC004	Sucrose derivative production in sugarcane	Sep-03–Dec-05	Dr Stevens Brumbley	$120,000
Total for Program C				**$953,990**

Program D Industry Capacity

Strategy D1	***Enhance people's capacity to learn and change***			
Continuing Projects				
ARP010	Australian Rural Leadership Program — Course 10	Jan-03–Jan-05	Mr John Quantrill	$0
CSR029	Building capacity to lead and implement regional transformation in the sugar industry	Jul-03–Dec-04	Mr Ian Sampson	$150,000
DHC001	Innovating and Developing Human Capacity in Rural Industries (joint RDC program)	Jul-01–Jul-06	Ms Tracy Henderson	$20,000
SRI130	Technology transfer — more skilled factory staff via troubleshooting/help manuals and access to SRI modelling software	Jul-03–Sep-06	Mr Rod Steindl	$71,088

Project	Title	Duration	Contact	Funds 2004–05
New Projects				
BSS271	Building young farmers capacity for change in the Central district	Jul-04–Apr-05	Mark Craig	$5,600
BSS272	Controlled-traffic study tour of the Birchip Cropping Group by the NSW farming systems steering committee	Jul-04–May-05	Mr Peter McGuire	$9,900
BSS273	Frost management, controlled traffic with wet harvests and co-generation management in Louisiana and Guatemala and attend ISSCT	Jul-04–May-05	Mr Peter McGuire	$8,000
BSS275	Enhancing capacity of the Bundaberg women in sugar group — Contrasting sugar and cotton	Jul-04–May-05	Ms Palmina Bonaventura	$5,315
BSS276	Learning and innovation bus tour for Central district grower group leaders	Jul-04–Oct-04	Joe Muscat	$10,000
CG005	Value adding and diversification learning tour for Maryborough sugarcane growers	Jul-04–Apr-05	Mr Frank Sestak	$5,000
CG006	Study tour of the Brazilian sugar industry by young leaders of the Babinda sugar industry	Jul-04–Mar-05	Ms Sarah Standen	$10,000
CSR030	Herbert cultural imprint analysis — A pathway to greater understanding and co-operation in decision making	Jul-04–Jun-06	Mr Gavin Hughes	$94,738
CSR031	Opportunities for Burdekin growers to learn about sustainable farming systems, grower directed research and cooperative farming models	Jul-04–Oct-04	Dr Lisa McDonald	$10,000
DEF001	Herbert River women participating in the Queensland Rural Women's Network 2004 State Conference	Jul 04–Dec-04	Ms Josie Vecchio	$4,500
IBS001	How are Herbert and Burdekin growers dealing with low sugar prices — A study tour for Innisfail Babinda growers	Jul-04–Jun-05	George Bugeja	$5,600
NSC007	Travel to the International Society of Sugar Cane Technologists Conference (ISSCT) in Guatemala in January 2005 and study tour of Brazil	Jul-04–Apr-05	Mr Rick Beattie	$9,800
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-07	Ms Tracy Henderson	$2,000

Project	Title	Duration	Contact	Funds 2004–05
RDA001	Innovator and R&D Awards	Jul-03–May-08	Dr Russell Muchow	$12,000
STA001	Student Travel Awards	Jul-03–May-08	Ms Tracy Henderson	$3,000
STU031	H Fengdou — Improved selection systems and data analysis for sugarcane breeding	Jan-02–Apr-05	Dr Phillip Jackson	$12,000
STU033	D Ward — Strategic baiting protocols for rodents in sugarcane	Feb-00–Sep-04	Dr John Wilson	$0
STU037	C Brosnan — Expression modulating sequences for preventing transgene silencing in genetically-engineered sugarcane	Apr-01–Jan-05	Dr Bernie Carroll	$14,500
STU038	N Flint — Sublethal and long term effects of poor water quality on freshwater and estuarine	Jan-01–Oct-04	Prof Richard Pearson	$0
STU039	E Meier — The availability of nitrogen in GCTB soils in the wet tropics and its impact on productivity and profitability	Mar-01–Jan-05	Dr Mal Wegener	$0
STU041	C Ngo — Molecular analysis of suckering and tillering in sugarcane	Jul-02–Jul-05	Dr Christine Beveridge	$29,000
STU042	K Ritter — An investigation of the genetic, biochemical and molecular basis of sugar accumulation in sugarcane	Mar-02–Jul-05	Dr Ian Godwin	$19,333
STU048	M James — Application of engineering principles and computer modelling skills to harvester	Jan-03–Jan-05	Dr Duncan Campbell	$14,500
STU049	P Wulf — Self-regulatory codes of practice & their effectiveness in achieving best environmental management practices within NQ primary industries	Jul-03–Jul-06	Prof Geoff McDonald	$29,000
STU050	Mira Durr — Microbiology of acid sulfate soils in agricultural environments	Mar-04–Jan-07	Dr Ben Macdonald	$32,000
STU051	Brendan Dyer — An integrated pest management strategy for climbing rat in the far-north Queensland sugarcane production system	Jul-04–Jul-06	Dr Peter Allsopp	$46,000
WS008	Continuous improvement and innovation workshop	Sep-03–Dec-04	Ms Janice Timms	$4,500
New Projects				
BSS274	Sugarcane-oriented quarantine training program	Jul-04–May-05	Dr Mohamed Sallam	$3,000

Project	Title	Duration	Contact	Funds 2004–05
CPI007	Participation in the International Workshop on Plant Membrane Biology	Jul 04–Sep-04	Dr Anne L Rae	$2,525
CPI008	Travel to attend the Plant and Animal Genome Conference	Jan-05–Jan-05	Miss Kimberley Ritter	$4,410
STU052	New Postgraduate 2004	Jan-04–Jul-06		$32,000
STU053	New scholarship from January 2005	Jan-05–Jan-05		$16,000
STU054	New scholarship from January 2005	Jan-05–Jan-05		$16,000
STU055	New scholarship from January 2005	Jan-05–Jan-05		$16,000
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	Ms Tracy Henderson	$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				
WS009	Assessment of regional R&D needs and opportunities	Jul-03–Sep-07	Ms Tracy Henderson	$20,000
WS010	Building capacity in evaluation theory and practice	Oct-03–Dec-04	Mr Bill Andrew	$20,000
Strategy D5	***Develop systems analysis skills of people within the industry***			
New Projects				
SRI139	Developing needs analysis skills to determine the research, development and extension needs of the four North Queensland sugar milling companies	Jul-04–Nov-04	Mr Geoff Kent	$4,970
Total for Program D				**$792,279**
Grand Total all Programs				**$6,339,627**

ATTACHMENT B

ORGANISATIONAL IDENTIFIERS IN PROJECT CODES

Project Codes	Organisation
AFF	Department of Agriculture, Fisheries and Forestry
ARP	Australian Rural Leadership Program
BSS	Bureau of Sugar Experiment Stations
CG	Canegrowers
CPI	CSIRO Plant Industry
CSE	CSIRO Sustainable Ecosystems
CSR	CSR Sugar Ltd
CTA	CSIRO Tropical Agriculture
CVA	Managing Climate Variability Program
DEF	Development, Education with a Focus on Sugar (DEFOS)
DHC	Rural R&D Corporations Developing Human Capacity Program
ICB	International Consortium for Sugarcane Biotechnology
IBS	Innisfail-Babinda Cane Productivity Services Limited
MAS	Mossman Agricultural Services
MSA	Mackay Sugar Cooperative Association
NSC	New South Wales Sugar Milling Cooperative Ltd.
OHS	Rural R&D Corporations Farm Health & Safety Program
RDA	SRDC R&D Awards and Innovator Awards
SRI	Sugar Research Institute
STA	Student Travel Awards
STU	SRDC Student Scholarships
UNW	University of New south Wales
UQ	The University of Queensland
WS	Workshops
YDV	Yield Decline Joint Venture

ATTACHMENT C

ABBREVIATIONS AND ACRONYMS

ACFA	Australian Cane Farmers' Association
ACGC	Australian Cane Growers' Council
AOP	Annual Operational Plan
AQIS	Australian Quarantine Inspection Service
ASMC	Australian Sugar Milling Council
ASSCT	Australian Society of Sugar Cane Technologists
BSES	Bureau of Sugar Experiment Stations
CAC Act	Commonwealth Authorities and Companies Act 1997
CCS	Commercial Cane Sugar
CP2002	Cross-Program: Accelerated Enhancement of Productivity and Profitability for the Australian Sugar Industry
CRC	Cooperative Research Centre
CRCSIIB	CRC for Sugar Industry Innovation through Biotechnology
CSIRO	Commonwealth Scientific and Industrial Research Organisation
NSWSMC	New South Wales Sugar Milling Cooperative
PIERD Act	Primary Industries and Energy Research and Development Act (1989)
QDPI	Queensland Department of Primary Industries and Fisheries
R&D	Research and Development
RDC	Research and Development Corporations
SRDC	Sugar Research and Development Corporation
SRI	Sugar Research Institute