2022/23

SUGAR RESEARCH AUSTRALIA LIMITED

ANNUAL REPORT

2022/23

Sugar Research Australia®

Sugar Research Australia Ltd.

sugarresearch.com.au

ABN 16 163 670 068 | ISSN 2203--7705

T 07 3331 3314
E sra@sugarresearch.com.au

Suite A Level 10
300 Queen Street
Brisbane QLD 4000
PO Box 133
Brisbane QLD 4001
Australia

Disclaimer: In this disclaimer a reference to 'SRA', 'we', 'us' or 'our' means Sugar Research Australia Limited and our directors, officers, agents and employees. Although we do our very best to present information that is correct and accurate, we make no warranties, guarantees or representations about the suitability, reliability, currency or accuracy of the information we present in this publication, for any purposes. Subject to any terms implied by law and which cannot be excluded, we accept no responsibility for any loss, damage, cost or expense incurred by you as a result of the use of, or reliance on, any materials and information appearing in this publication. You, the user, accept sole responsibility and risk associated with the use and results of the information appearing in this publication, and you agree that we will not be liable for any loss or damage whatsoever (including through negligence) arising out of, or in connection with the use of this publication. We recommend that you contact our staff before acting on any information provided in this publication.

Warning: Our tests, inspections and recommendations should not be relied on without further, independent inquiries. They may not be accurate, complete or applicable for your particular needs for many reasons, including (for example) SRA being unaware of other matters relevant to individual crops, the analysis of unrepresentative samples or the influence of environmental, managerial or other factors on production.

Acknowledgements: SRA acknowledges and thanks its investors, including levy payers (sugarcane growers and millers), the Commonwealth Government and the Queensland Government.

Southern grower Robert Quirk and SRA Weed Scientist Emilie Fillols at the Wardell Pre-Emergent Herbicide Workshop.

ACKNOWLEDGEMENT OF COUNTRY

Sugar Research Australia acknowledges the traditional custodians of the lands where we operate and conduct our business. We pay our respects to ancestors and Elders, past and present.

We are committed to honouring Aboriginal and Torres Strait islander peoples' unique cultural and spiritual relationships to the land, waters and seas and their rich contribution to society.

CONTENTS

2022/2023 HIGHLIGHTS

2022/2023 HIGHLIGHTS

$35.5 million investment
to deliver more than 100 RD&A activities

38 tonnes reduction
in dissolved inorganic nitrogen through sustainability projects*

2 new varieties released including SRA40Ⓓ in the Herbert and Central and SRA41Ⓓ in NSW

Genomic selection
applied to accelerate the time to release novel nematode resistant varieties

Harvest Mate app
launched in partnership with the Department of Agriculture and Fisheries

See Case Study page 64

5.3% productivity gain in avoided losses from Ratoon Stunting Disease by SRA's Pathology Laboratory

69%
of levy payers reported adopting SRA products or production practices

1,019 industry stakeholders
engaged for RD&E priorities and activities

72% and 68%
of growers and millers reported satisfaction with SRA's performance

8 cross-sectoral projects
collaborated with other RDCs

38 research papers
published from funded projects

11 industry research scholarships supported

MESSAGE FROM THE CHAIR

On behalf of the Sugar Research Australia Board, welcome to our Annual Report for 2022/2023.

This year we have celebrated the 10th anniversary of Sugar Research Australia's inception, a significant chapter in our journey, which has been intertwined with the Australian sugarcane industry for more than a century.

Over this time, Sugar Research Australia has built upon the solid foundations laid down by its predecessors. We have transformed into an adaptive organisation that is embracing innovative technologies, data-driven insights, and industry-wide partnerships. Our journey has been characterised by growth, transformation, and the pursuit of new opportunities to benefit the sugar industry.

One of the most remarkable aspects of Sugar Research Australia's journey has been its unwavering commitment to delivering tangible outcomes. Our research initiatives have led to the development of innovative farming techniques, pest and disease management strategies, and sustainable cultivation practices.

We have continued to forge strong partnerships with sugarcane growers and millers, industry stakeholders, academic institutions, governments and research organisations. Our greatest assets are our people and partnerships. Things may have changed in the past ten years, however this fact remains true.

There has been a 40 per cent increase in stakeholder engagement in relation to research, development and adoption activities, in addition to SRA's knowledge transfer events and farm visits, compared to previous years. In 2022/23, 72 per cent of growers and 68 per cent of millers reported satisfaction with SRA's overall performance - an increase of five and three per centage points respectively, from the previous year.

In 2022/23, collaboration continues with other Rural Research and Development Corporations on eight cross-sectoral research projects. SRA also received revenue from licensing the See & Spray™ technology to John Deere, following a collaboration between SRA, the University of Southern Queensland, Horticulture Innovation Australia, and Cotton Research and Development Corporation.

SRA would like to acknowledge our government co-investment partners for their ongoing contributions to our research. In November, SRA and the Queensland Government's Department of Agriculture and Fisheries signed a new Sugarcane RD&E Funding Deed 2022/23 to 2026/27 that will provide funding to SRA for sugarcane research activities. Moreover, in March, SRA and the Australian Government's Department of Agriculture, Fisheries and Forestry held its annual performance meeting, and met all five performance principles required for the previous year.

Throughout the year, SRA commissioned Pitcher Partners to complete an external financial audit which reported no material findings. Deloitte also completed four internal reviews to improve risk management of areas including cyber security, procurement, payroll, and project cost allocation. SRA is now implementing recommendations from these reviews and is undertaking another four reviews during 2023/24.

As part of our ongoing strategic plan implementation, SRA's Indooroopilly property was sold to support our research portfolio and the significant upgrade of our research stations, scheduled to begin in 2023/2024.

SRA's safety performance continues to mature with a focus on our Health, Safety and Environment Management System, resulting in a decrease in the total recordable injury frequency rate (TRIFR) to 14 recorded in June 2023.

Throughout the year, SRA continued to implement its Strategic Plan 2021-2026 to ensure we are a fit-for-purpose organisation able to deliver the changing needs of the sugarcane industry. This has seen significant achievements and progress on our transformation initiatives.

Twelve months on from the Strategic Plan's introduction, SRA's Board and Management reviewed the plan to ensure we are delivering the greatest impact for our industry.

Much of the work to set the organisation up for success is now complete, and as we move forward with our Strategic Plan Update 2021-2026, levy payer engagement will continue to be the mechanism through which we actively listen and translate input to deliver tangible benefits to industry.

By fostering strong connections and open lines of communication with sugarcane growers, millers, and industry partners, we will ensure that our research and services are directly aligned with their needs and aspirations.

On behalf of the SRA Board, I would like to thank Roslyn Baker for her services as Chief Executive Officer and her contribution to the sugarcane industry. I welcome Shaun Coffey who was appointed as the Interim Chief Executive Office upon Roslyn's resignation.

I would like to extend my gratitude to SRA Board members who have retired this year, Sam Bonanno, Dr Jeremy Burdon, and Lindy Hyam.

I would like to sincerely thank sugarcane growers and millers, industry organisations and partners, the Commonwealth and Queensland Governments, the dedicated members of our board, and the entire Sugar Research Australia team. Without your unwavering support and collaboration, our journey over the past year and the last decade would not have been possible.

Your commitment to innovation, sustainability, and excellence in the sugarcane industry has been instrumental in our progress and achievements. The increased engagement, higher levels of satisfaction, and successful collaborations highlighted in this report are a testament to our collective efforts.

Thank you for your ongoing trust and support. Here's to another year of growth, transformation, and shared success in the sugarcane industry.

Rowena McNally

One of the most remarkable aspects of Sugar Research Australia's journey has been its unwavering commitment to delivering tangible outcomes.

MESSAGE FROM THE INTERIM CEO

Once again, Sugar Research Australia and the Australian sugarcane industry have had a busy and productive year.

During the reporting period, we have continued to become a more sustainable and capable business with a greater emphasis on stronger connections and partnerships with industry, a research investment portfolio that delivers sooner, and increased investment capacity to accelerate innovation.

The past 12 months have seen SRA's Industry Services team, including District Managers, continue to build strong local level engagement to deliver valuable Research, Development and Adoption (RD&A) activities, creating a clear benefit to levy payers and our funding partners. This engagement has seen the introduction of several initiatives aimed at enhancing productivity, profitability, and sustainability within the sugarcane industry.

A demonstration of this has been our collaboration with Queensland's Department of Agriculture and Fisheries in the development and launch of Harvest Mate, a decision support tool and platform which has empowered growers and harvesting contractors to make profitable data-led decisions on harvesting practices. This innovative product provides an opportunity to increase growers' cane and sugar yield, with an average of a five per cent yield increase and the potential to deliver a significant increase in profit after paying both harvesting costs and levies.

Pleasingly, feedback from SRA events such as field days and information sessions, indicates 69 per cent of levy payers have adopted or have plans in place to adopt products or production practices developed by SRA.

SRA's Variety Development team continue to work closely with industry. The 2023 Plant Breeding Rights (PBR) portfolio now comprises of 69 registered varieties. These represent more than 95 per cent of commercial production. An additional seven new varieties have provisional PBR protection. Furthermore, new research has produced genomic predictions for smut and Pachymetra root rot. Breeders can use these predictions to breed more resistant varieties to these significant diseases. The genomic prediction models will be implemented in SRA's Breeding Program during 2023 and are expected to result in a benefit of improved genetic gain.

Working in collaboration with Regional Variety Committees, two new SRA-developed varieties were approved for release, including SRA40℗ in the Herbert and Central districts and SRA41℗ in New South Wales.

Our continued research focus on crop protection, and pest and disease management has made several noteworthy advancements including:

- The full genome sequencing of the Greyback Canegrub, a world first and an important step to designing bioactive double-stranded ribonucleic acid (dsRNA) molecules for a novel and sustainable biopesticide to control canegrubs and other root feeding pests.
- The development of a new deoxyribonucleic acid (DNA) test based on loop-mediated isothermal amplification (LAMP) to detect the presence of the Ratoon Stunting Disease (RSD) pathogen in samples of expressed cane juice at the mill. The assay can be undertaken in the mill to accurately measure RSD incidence in each batch of cane as it is crushed.

Through a year of significant change for the organisation, I would like to thank the SRA team who continue to demonstrate their commitment to delivering for the industry and our communities. Thank you to our growers and millers for participating and contributing to SRA events, meetings, and on-farm trials. You are making SRA's work possible.

I would also like to thank and recognise the support provided by CANEGROWERS, the Australian Sugar Milling Council, Australian Cane Farmers Association, AgForce, regional industry organisations, and productivity service providers in delivering for our industry.

Thank you to our co-investment partners: the Commonwealth Department of Agriculture, Fisheries and Forestry; the Commonwealth Department of Climate Change, Energy, the Environment and Water (Reef Trust); the Queensland Department of Agriculture and Fisheries; the Queensland Department of Environment and Science; the Great Barrier Reef Foundation and the Australian Research Council.

I invite you to read the Annual Report as a summary of the dedicated efforts of our SRA staff.

Shaun Coffey

The past 12 months have seen SRA's Industry Services team, including District Managers, continue to build strong local level engagement to deliver valuable Research, Development and Adoption (RD&A) activities, creating a clear benefit to levy payers and our funding partners.

ABOUT
SUGAR RESEARCH AUSTRALIA

Sugar Research Australia (SRA) is Australia's specialist sugarcane research organisation, under the *Sugar Research and Development Services Act 2013 (Cth)*. We invest in evidence-based research, development and adoption (RD&A) activities on behalf of sugarcane growers and millers to meet industry challenges and opportunities.

OUR VISION

To be a trusted partner, shaping the future prosperity of the Australian sugarcane industry and regional communities through innovation and ingenuity.

OUR PURPOSE

We keep the Australian sugarcane industry competitive, productive and sustainable through innovative research and product development.

KEY RESPONSIBILITIES

- Deliver cost-effective research and development services to the Australian sugarcane industry to enhance its viability, competitiveness and sustainability
- Carry out, coordinate and provide investment for R&D activities in relation to the Australian sugarcane industry
- Facilitate the dissemination, extension, adoption and commercialisation of results of R&D activities
- Support and develop industry research capacity.

SRA Pathologist Dr Rob Magarey discusses plant diseases with local growers at SRA Tully station.

FACILITIES

With 125 staff across eight research stations and six farms, SRA is uniquely positioned with extensive in-house research and adoption capability across critical research disciplines, including:

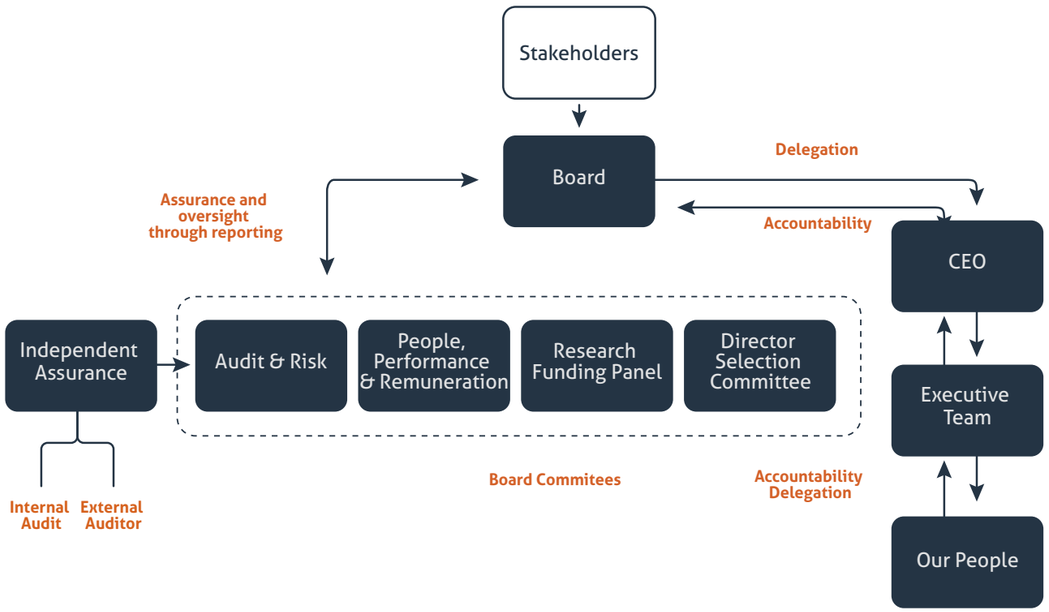
- Agronomy
- Biosecurity
- Digital and data agricultural science
- Entomology
- Environmental science
- Farming systems and machinery
- Geo-spatial and data science
- Milling technology
- Plant pathology
- Pre-breeding and sugarcane variety development
- Research and development management
- Sustainability science
- Weed science.

OUR VISION

To be a trusted partner, shaping the future prosperity of the Australian sugarcane industry and regional communities through innovation and ingenuity.

CORPORATE GOVERNANCE FRAMEWORK

Sugar Research Australia's corporate governance framework provides the structure through which strategy and business objectives are set, performance is monitored, and risks are managed. It also outlines the flow of information and accountability across the governance structure.



The Board of Directors is responsible for the direction, policies, strategies and financial objectives of SRA.

SRA's Board operates in accordance with its charter and has reserved certain powers for itself.

Four Standing Committees assist the Board with effectively discharging its responsibilities, including:

- Audit and Risk Committee
- People, Performance & Remuneration Committee
- Research Funding Panel
- Director Selection Committee.

Day-to-day management of SRA, and the implementation of approved business plans and corporate strategies, have been delegated to the CEO, who in turn may further delegate to the Executive Team.

LEADERSHIP

Board of Directors

The Board of Directors is responsible for the overall governance and strategic direction of the organisation. A skills-based team, the Board of Directors, in place following SRA's Annual General Meeting (AGM) in November 2022 was:

ROWENA MCNALLY

LLB, FAICD, FIML, FRI

Independent | Non-Executive Chair

Director and Chair since 21 October 2021

Member of the Audit and Risk Committee (since 14 December 2021), the People, Performance and Remuneration Committee (since 14 December 2021), and the Research Funding Panel (since 14 December 2022)

Rowena has more than 20 years' experience as a Board Chair and board director with extensive experience in regional Queensland. She has held various roles in the sugar industry including several years as the Sugar Industry Commissioner and Chair of the Sugar Authority and various roles with the then statutory marketing authority. Rowena has held several chair and board roles in the water, energy and hospital and health sectors.

Rowena is a Fellow of the Australian Institute of Company Directors, the Institute of Managers and Leaders, and the Resolution Institute, and is a member of the Australian Water Association.

Rowena is the Chair of Mercy Community Services SEQ, Mercy Health and Aged Care CQ and Mercy Community Services Nth QLD and Mt Isa Rodeo Limited.

SHAUN COFFEY

BAgrSc(Hons), MAgrSc, FTSE. FAIA, FAICD, CRSNZ

Independent | Non-Executive Director and Interim Chief Executive Officer

Director from 21 November 2022 to 9 July 2023

Interim Chief Executive Officer since 10 July 2023

Member of the Audit and Risk Committee (since 30 May 2023), the People, Performance and Remuneration Committee (since 14 December 2022), and the Research Funding Panel (since 21 November 2022). Shaun ceased to be a member of any committee upon his resignation as a director of SRA.

Shaun is an internationally acknowledged leader in science and innovation.

His interests in the sugar industry stem from the 1990s, when he was a Regional Director, then Director of Research and Extension, in the Queensland Department of Primary Industries.

An agronomist by training, Shaun has developed broad interests across science and technology through key leadership roles, such as Foundation Chief of the CSIRO Division of Livestock Industries (2002-2006) and as CEO of the NZ Crown entity, Industrial Research Ltd (2007-2013).

Shaun serves on the Board of the Future Fuels Cooperative Research Centre, as Chair of the Agriculture and Food Forum of the Australian Academy of Technological Sciences and Engineering, and as Director of Capacity Building in the Crawford Fund for a Food Secure World.

MARK DAY

BAppSC (Mathematics)

Independent | Non-Executive Director

Director since 21 October 2021

Member of the Audit and Risk Committee (since 3 November 2021)

Mark was appointed to the board of Mackay Sugar Limited (MSL) in May 2017 and was Chairman of MSL from November 2017 until August 2019. Mark also acted as Chief Executive Officer of MSL from January 2018 until April 2020.

Mark recently completed three and a half years in Brazil as Operations Director for eight sugar cane factories.

Prior to that Mark had an extensive career with CSR/Wilmar in sugar, managing CSR's cane sugar businesses as Executive General Manager for six years and two years in Indonesia with Wilmar.

Mark has served as a director on the Board of Sugar Terminals Limited, the Bureau of Sugar Experiment Stations, Sugar Research Institute and Australian Molasses Trading and was also a director and Chairman of Australian Sugar Milling Council for a period.

ROSEMARY RICHARDS

BAgrEc, MBA, GAICD

Independent | Non-Executive Director

Director since 21 November 2022

Member of the Audit and Risk Committee (since 30 May 2023), the People, Performance and Remuneration Committee (since 14 December 2022), and the Research Funding Panel (since 10 July 2023, previously an Observer since 14 December 2022)

Rosemary has more than 20 years' experience in the food and agribusiness sectors, including considerable executive and board experience.

She has held various roles in broadacre cropping including board roles in the grains, cotton and the research and development sectors.

She is a passionate communicator and industry advocate. Her experience in project management, trade policy and strategy development extends across all facets of agri and food sectors.

Rosemary has extensive experience in the biotechnology sector, including regulatory frameworks, commercialisation, and advocacy.

Rosemary is Deputy Chair of the Cotton Research and Development Corporation (CRDC) and Chair of the Australian Oilseeds Federation.

PETER RUSSO

MAICD

Independent | Non-Executive Director

Director since 25 October 2018

Member of the Audit and Risk Committee (since 14 December 2021), the People, Performance and Remuneration Committee (since 14 December 2021)

Peter has more than 40 years of experience in sugarcane growing and milling.

Working in a farming partnership with his two sons in the Childers region, he is knowledgeable in all aspects of sugarcane farming and is particularly passionate about the adoption of innovative practices ranging from irrigation to land management to harvesting.

Peter was Chairman of the Board of the Isis Central Sugar Mill and served on the Board from 1990 to 2020. He has served on various committees while on the Isis Central Sugar Mill Board and has also previously been a Board member of St Luke's Anglican School, Bundaberg. He is a member of the Australian Institute of Company Directors (AICD).

Peter is a director of PNR Nuts Pty Ltd.

GAVIN WHITELEY

AAgriEc (Hons), Assoc. Dip. Farm Mgmt., CPA, FAICD, FARLF, JP (NSW)

Independent | Non-Executive Director

Director since 21 November 2022

Chair of the Audit and Risk Committee (since 30 May 2023), Member of the Audit and Risk Committee (since 14 December 2022)

Gavin is an experienced property, agribusiness and food sector executive and non-executive director.

He has an extensive background across the broader food and agribusiness supply chain, having held executive roles in the agricultural property, grain, beef, cotton and chicken meat industries.

His roles have extended from research and development, corporate advisory and capital-raising work through the production, processing and distribution sectors.

He holds an honours degree in Agricultural Economics from the University of New England and an Associate Diploma in Farm Management. He is a CPA-qualified accountant, a Fellow of the Australian Institute of Company Directors and a graduate of the Australian Institute of Company Directors and the Australian Rural Leadership Program.

Gavin is the Managing Director of The Micketymulga Group, a private Australian agribusiness and property investment, management and advisory business. He also chairs several family boards, primarily within the Australian agricultural sector.

ROWLEY WINTEN

BAgrSc, Grad. Dip. Business Studies, MAICD

Independent | Non-Executive Director

Director since 21 October 2021

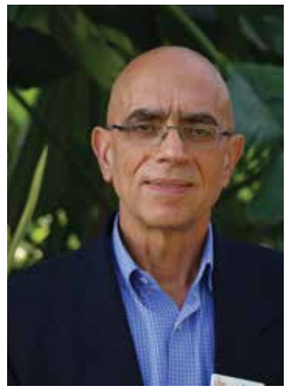
Chair of the People, Performance and Remuneration Committee (since 14 December 2022), Member of the People, Performance and Remuneration Committee (since 14 December 2021)

Rowley is an international marketing professional with an agronomy background having worked in Australia, Asia Pacific and Europe with more than 40 years' experience in agriculture across a diverse range of broadacre and intensive farming systems. He has held senior roles in R&D and strategic marketing for a number of leading multinational crop protection companies during this time.

Rowley has broad experience in marketing strategy, brand portfolio management, product development, business transformation and change management. Rowley's current focus is on specialising innovation to drive productivity improvement across cropping systems in Asia Pacific countries to benefit farmers and their communities.

Rowley has represented industry on a number of national committees.

Rowley is a current director of Winagri Pty Ltd and the APAC Head of Product Biology for Syngenta Asia Pacific Pte Ltd.



SAM BONANNO

BEng (Mechanical), AdvDip (Business Management), GAICD

Independent | Non-Executive Director

Director from 25 October 2018 to 29 May 2023

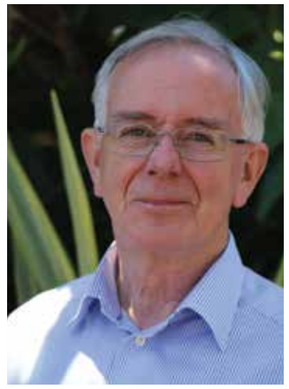
Chair of the Audit and Risk Committee (to 29 May 2023)

Sam is an independent non-executive director with more than 40 years' experience in ports, logistics, infrastructure, mining and agricultural industries in Australia and overseas.

Sam has experience in strategic planning and implementation, commercial negotiations, business planning, operations management, asset management, project management, materials processing and bulk supply chain management.

Sam has held four non-executive board positions in Australia – with three key industry-wide service providers and a government corporation for regional economic development – and is being a director and chair of a global industry association for bulk export coal ports and terminals.

Sam is currently an independent non-executive director of Sugar Terminals Limited (STL) and a member of the Strategic Planning and Projects Committee at CQUniversity.



DR JEREMY BURDON

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

Independent | Non-Executive Director

Director from 24 October 2019 to 21 November 2022

Chair of the Research Funding Panel (since 21 November 2022), Member of the People, Performance and Remuneration Committee (to 21 November 2022)

Jeremy has an international reputation as both a scientist (evolutionary biology) and a research manager and strategic planner. In the early 2000s he was involved in the sugar industry guiding research relationships between CSIRO and BSES and as a Director of the CRC for Sugar Industry Innovation through Biotechnology.

Jeremy has broad interests across all plant-based agricultural industries developed through a previous role as Chief of the Division of Plant Industry, CSIRO (2003-2012). Additionally, and subsequently, he has served on the Board of Trustees of Bioversity International (a member of the CGIAR: 2009-2015), on the Board of the Grains Research & Development Corporation (2011-2017), and as the Chair of the Australian Academy of Science's National Committee for Agriculture, Fisheries & Food. During the current reporting period he joined the Board of the Australian Pesticides & Veterinary Medicines Authority (APVMA) as a non-executive director (March 2022 onward), and was an advisor to the Australian Plant Phenomics Facility. Jeremy is a non-executive director of APVMA.

LINDY HYAM

B.Ed, Dip Teach, MBA

Independent | Non-Executive Director

Director from 24 October 2016 to 21 November 2022

Chair of the People, Performance and Remuneration Committee (to 21 November 2022)

Lindy has worked extensively in agriculture with engagement across more than 40 established, new and emerging commercial plant based and levy paying industries and their research communities, including sugar, addressing issues along the value chain ranging from grower based through to commercialisation of R&D outcomes, biosecurity and international marketing of product.

Lindy has more than 20 years of leadership experience at board and CEO levels in the private and public sectors across urban and regional Australia and internationally with a diverse range of organisations of all sizes and governance structures. Lindy has held many board roles across a range of disciplines in addition to agriculture including city leadership, health, airports, resources recovery, legal services, professional services, the environment and education.

Lindy was a Fellow of the Australian Institute of Company Directors for 14 years.

Lindy was appointed Chair of the Centre of Excellence for Biosecurity Risk Analysis funded by the Australian Commonwealth Government and NZ Ministry for Primary Industries on 1 July 2021. During the reporting period, Lindy served as a director for Hunter Central Coast AFL, and Presiding Member for Fisheries Research and Development Corporation Selection Committee (appointed from 15 February 2021).

The following persons were Directors of the Company during the 2022-2023 financial year:

- Rowena McNally – Independent Non-Executive Chair
- Shaun Coffey – Independent Non-Executive Director (retired effective 9 July 2023) and interim Chief Executive Officer (appointed effective 10 July 2023)
- Mark Day – Independent Non-Executive Director
- Rosemary Richards – Independent Non-Executive Director
- Peter Russo – Independent Non-Executive Director
- Gavin Whiteley – Independent Non-Executive Director
- Rowley Winten – Independent Non-Executive Director
- Sam (Salvatore) Bonanno – Independent Non-Executive Director (retired 29 May 2023)
- Dr Jeremy Burdon – Independent Non-Executive Director (retired 21 November 2022)
- Lindy Hyam – Independent Non-Executive Director (retired 21 November 2022)

Those Directors listed as Independent Non-Executive Directors have been independent throughout the period of their appointment.

BOARD COMPOSITION

The seven-member Board is committed to ensuring that it comprises individuals with an appropriate range of skills, experience, expertise and diversity to deal with current and emerging issues with regard to the sugarcane industry.

CORPORATE GOVERNANCE STATEMENT

Our corporate governance framework and practices have complied with the ASX Corporate Governance Council's Corporate Governance Principles and Recommendations (4th Edition) (ASX Recommendations) throughout the 2022/23 financial year.

The Board continually reviews SRA's governance policies and practices to ensure that they remain appropriate in light of corporate governance developments and changes in expectations, including as reflected in the revised 4th Edition of the ASX Recommendations.

SRA's 2023 Corporate Governance Statement provides detailed information on our corporate governance practices for the year ended 30 June 2023.

The Corporate Governance Statement is available at: www.sugarresearch.com.au/about/corporate-governance.

POLICIES AND PRACTICES

As part of our commitment to operating to the highest standards of ethical behaviour, we have a range of policies and practices that set ethical standards for directors, employees, contractors and third parties. These policies describe core principles designed to ensure ethical conduct is maintained in the interests of members and other stakeholders.

The SRA Code of Conduct is our code for business conduct – it contains principles and standards of conduct which are based on SRA's values and represents our commitment to uphold ethical business practices and meet applicable legal requirements. The Code of Conduct applies to all directors and officers of the Company.

The Code of Conduct is supported by a number of governance policies to guide how SRA does business and outline expected standards of behaviour, including:

- **Board Governance Policy** – sets out the mechanisms to ensure the efficient and effective operation of the SRA Board. It aligns with, and augments, the *Corporations Act* and SRA Constitutional provisions in relation to the SRA Board.
- **Diversity Policy** – provides the framework by which SRA actively encourages and facilitates diversity across the organisation. SRA is an equal opportunity employer.
- **People & Culture Policy** – provides a framework for the development of best practice Organisational Development and Human Resources policies and procedures that facilitate the alignment of values, people and performance in our achievement of quality outcomes for the sugar industry.
- **Compliance Policy** – a Compliance Framework is in place to ensure that the SRA Board, CEO and SRA staff can make informed decisions under a robust framework that is aligned to the broader SRA Risk Management Framework and corporate governance structure.
- **Risk Management Policy and Risk Management Plan** – provide guidance and direction on the management of risk in SRA and states SRA's commitment to the effective management of risk.
- **Whistleblower Policy** – encourages SRA directors, employees and contractors to confidentially report unethical or illegal conduct and raise concerns regarding actual or suspected contraventions of ethical or legal standards, without fear of victimisation, reprisal or harassment.

OPERATING INCOME AND EXPENDITURE SUMMARY

During 2022/23, SRA invested $35.5 million in delivering RD&A activities. This includes investment in contestable projects, core programs and services, adoption activities via district productivity plans, and corporate support initiatives.

SRA's income streams consist of a levy from sugarcane produced and processed within Australia paid by growers and millers, matched by a contribution from the Commonwealth Government for investment in RD&A activities as per the Statutory Funding Agreement 2021-2031 between SRA and the Commonwealth acting through the Department of Agriculture, Fisheries and Forestry. SRA also receives funding from co-investment partners including, but not limited to, the Queensland Department of Agriculture and Fisheries, the Queensland Department of Environment and Science, and the Great Barrier Reef Foundation.

Operating Income	**$000**
Industry investment	23,809
Commonwealth co-investment	7,760
Queensland Government co-investment	379
Collaboration income	5,454
Services and consulting income	823
Interest received	1,358
Other income	12,714
Operating Income Total	**52,297**

Numbers are rounded.

Operating Expenditure	**$000**
R&D contestable	9,598
R&D internal core	13,882
Industrial contract research	1,658
Research adoption	3,257
R&D operational support	718
R&D expenditure total	**29,114**
Board and investor relations	683
Corporate support	5,259
Corporate total	**5,943**
Operating expenditure total	**35,057**
Total SRA Operating Result	**17,241**
Initiatives	398
Total SRA Result	**16,843**

Numbers are rounded.

During a tour of the Mackay Renewable Biocommodities Pilot Plant, Dr Jerome Ramirez addresses Madeline Smith and PhD Student Karen Rodrigues Martinez with Dr Heng-Ho Wong.

STRATEGIC APPROACH

SRA's Strategic Plan 2021-2026 puts industry at the heart of decision making, committing to strong collaboration and to growing industry satisfaction with, and adoption of, research and development that fosters productivity and growth.

The Annual Report structure aligns with the strategy's five strategic pillars and five Research Missions, measuring outcomes against each.

PILLAR 1:
STRONG FOUNDATIONS

Evolve SRA to keep pace with the changing industry landscape by developing a capable, engaged, and safe workforce, and a lean, agile and entrepreneurial organisation with an agile and efficient cost-base.

PILLAR 2:
A HIGH-PERFORMING RESEARCH PORTFOLIO

Design a focused, balanced and collaborative portfolio of research, development and extension (RD&E) investments and initiatives that deliver tangible solutions and options to advance the productivity, sustainability, profitability, and long-term growth prospects for the Australian sugarcane industry.

PILLAR 3:
TRANSLATION EXPERTISE

Translate research findings into tools, products and services that save industry time and money, and improve environmental performance.

PILLAR 4:
WORLD-CLASS SUGARCANE VARIETIES

Accelerate innovation in variety development to offer varieties that consistently underpin the success of the industry's current and future product objectives, crop production and protection while lowering development costs and shortening cycle-times.

PILLAR 5:
COMMERCIAL BENEFITS AND REWARDS

Take our research work and investments to the next level by securing investors and funding and extracting commercial value from our intellectual property, research capability, facilities and strategic partnerships.

RESEARCH MISSIONS

SRA Variety Development Manager Southern and NSW Roy Parfitt and SRA Variety Officer Southern Clare Hogan.

MISSION 1:
PROFITABLE AND PRODUCTIVE

Continuous improvement in farming and milling profitability.

MISSION 2:
RESILIENT AND ENDURING

Position the industry to stay ahead of climate, environmental and biosecurity threats.

MISSION 3:
DIVERSIFIED AND ADAPTABLE

Capitalise on changing consumer preferences, and the growing bio and green economies to develop diversification opportunities.

MISSION 4:
WEALTH GENERATING THROUGH LAND STEWARDSHIP

Position the Australian sugarcane industry as leaders in profitability, environmental sustainability and resource-use efficiency.

MISSION 5:
SKILLED FOR THE FUTURE

Support the development of an adaptable, professional, commercial and entrepreneurial industry and research community.

PILLAR 1:
STRONG FOUNDATIONS

GOAL: Evolve SRA to keep pace with the changing industry landscape by developing a capable, engaged, and safe workforce, and a lean, agile and entrepreneurial organisation with an agile and efficient cost-base.

SRA is committed to achieving its strategic direction by building strong foundations through the development of a capable, engaged and safe workforce within a lean, agile and entrepreneurial organisation.

We are committed to the effective management and leadership of our core asset – our people – and the important role our employees play in delivering the strategic objectives and upholding organisational values.

Several initiatives assisted in bringing SRA's strategy to life in 2022/23 including:

- Culture, engagement and internal customer satisfaction surveys to understand the engagement and pulse of our employees.
- Performance management framework to support a high-performance organisation.
- A remuneration, reward and recognition framework to remain competitive in a highly mobile and competitive employee market.
- Commencement of a talent and succession planning framework to harness existing talent and knowledge, and transition to the next generation.

The Culture and Engagement survey in January 2023 built on the previous year's results.

Response rate increased by 27 per cent with three-quarters of employees participating. Engagement results remained stable at 74.8 per cent, below the high-performance benchmark of 82 per cent, highlighting opportunities for improvement.

In response to feedback, a comprehensive action plan is being implemented to improve job satisfaction and security and provide clarity in relation to career progression and development.

Themes from the survey, along with feedback from senior leader forums, and internal satisfaction results, have been collated to enable SRA to implement targeted initiatives, further strengthening employee engagement, boosting collaboration, and driving innovation.

A key project underway is the development of a Leadership Competency, Critical Role and Succession Planning Framework which will:

- Bring SRA's vision and values to life, translating them into specific, observable behaviours.
- Provide visibility where key capability risk sits in the business.
- Mitigate business risk by actively managing talent pipelines both internally and externally.
- Underpin ongoing reform and review of critical people and culture processes such as recruitment, onboarding, performance, development, succession and reward.

To build a future workforce and share the knowledge of SRA's research and scientific talent, employees have been actively involved in career fairs and education delivery at educational institutions.

Like other organisations, SRA has responded to the significant and complex changes in legislation affecting employees, with educational workshops, supporting tools and promotion of SRA support mechanisms, such as the Employee Assistance Program throughout the year.

A Diverse Workforce

SRA continues to focus on developing its diversity profile and promoting inclusion in the workplace. We continue to work towards our 2025 diverse workforce target. Our initiatives include:

Workplace Gender Equality Agency (WGEA) reporting

- SRA undertakes WGEA reporting annually.
- We ranked 43 out of 318 organisations for gender pay parity in the 2022/23 WGEA Industry Analysis Benchmark Report.
- Our overall gender pay gap (GPG) is currently 6.3 per cent, significantly narrower than the median gap of 17.6 per cent.

Women in Technology (WiT)

- This year we acquired corporate membership to Women In Technology (WiT).
- All SRA employees can access member benefits, which include programs tailored to support women from culturally and linguistically diverse backgrounds to excel in Science, Technology, Engineering and Mathematics (STEM) careers. careers.

Reconciliation Action Plan (RAP)

- Planning is underway for our first Reconciliation Action Plan (RAP) with registration completed.
- Project leaders have attended Cultural Capability training conducted by BlackCard, a consultancy certified by Supply Nation.
- We aim to partner with Supply Nation certified organisations and establish business relationships with Aboriginal and Torres Strait Islander stakeholders.

SRA Manager Industry Services Operations Heidi du Clou using a MicroNIR tool to demonstrate how the light source interacts with the surface of material.

Health, Safety and Environment

SRA remains focused on its goal of working towards mature safety, with a culture of learning and continuous improvement where all employees are encouraged to influence and lead safety in the workplace.

Health, Safety and Environment (HSE) Improvement Plan

The HSE Improvement Plan has been a key focus with a total recordable injury frequency rate (TRIFR) reduction from 43 to 14 recorded in June 2023.

Using learnings from the past three years, we will review the current Plan to further improve SRA's health and safety culture, improving performance as a result.

HSE Management System

SRA and all employees have been involved in the final stage of implementation for the HSE Management System, a proactive approach to keeping our people safe. Improvements in the system have contributed to:

- 87 per cent increase in hazards reported from the previous reporting period.
- Education sessions including warnings and locks for faulty equipment (lockout-tagout), risk assessment and management, HSE standards.
- Updated risk registers with active engagement and consultation across all locations.
- >99 per cent HSE training compliance.
- 50 per cent reduction in investigation closeout time.
- Nil reportable environmental incidents.

A component of the HSE Management System is a systemic assurance program with three levels of verification audits – Internal, corporate, and independent/external – which seeks to identify areas for improvement, areas where deviations may be occurring, and areas where rectification is required.

The program has been very well received with insights to be used in the development of specifically targeted initiatives.

Initiatives delivered during 2022/23 include:

- Snake awareness sessions delivered during Safe Work Week.
- Online and practical defensive driving for those with high exposure.

SRA Central District Delivery Officer Stephanie Duncan shows growers at the Gargett irrigation demonstration a Wi-Fi base station.

Outcome Measures

Target	Details
By 2022, deliver small year-on-year surpluses (measured based on underlying results and not including decisions to strategically invest reserves)	In 2022/23, SRA reported a $16,843,000 surplus, which includes $12,062,340 on the sale of property in Brisbane. The surplus delivered for the year from operating activities was $3,423,000.
SRA operates within approved thresholds	In 2022/23, SRA was not reliant on cash reserves to operate.
By 2022, achieve progressively improved staff engagement by 2022 (against the SRA leadership index and Aon Hewitt staff engagement index)	In 2022/23, results from SRA's engagement survey indicate an engagement score of 74.8 per cent, a slight decline of 0.6 per centage points from the previous year.
By 2023, achieve safety maturity against safety improvement plans	In 2022/23, SRA completed all planned safety maturity initiatives for the year.
Cultural maturity - progress towards cultural attributes of a learning and innovative culture	In 2022/23, results from SRA's culture survey indicate average scores for positive individual and group outcome items were higher than benchmark results suggesting improvement. However, results for negative individual outcome items (negatively scored) were higher than benchmarks indicating improvement in some areas is required.
By 2022, target gender diversity by ensuring that 50 per cent of senior leadership / researcher positions within SRA are occupied by women by 2022	At the end of 2022/23, 42 per cent of research and leadership positions were occupied by women, a small decline of three per centage points from the previous year.
By 2024, target 50 per cent of SRA board positions occupied by women by 2024	At the end of 2022/23, 29 per cent of Board positions were occupied by women, an unchanged result from the previous year.
By 2025, ensure that SRA's workforce demographics are representative of the communities in which we operate in terms of numbers of indigenous employees, employees with disabilities, and employees from non-English speaking backgrounds by 2025	In 2021/22, 56 per cent of SRA staff responded to a voluntary survey. Results suggest 30 per cent of staff are from non-English speaking backgrounds, six per cent experience a physical or cognitive disability, 55 per cent have caring responsibilities, and one per cent are indigenous.

PILLAR 2:
A HIGH-PERFORMING RESEARCH PORTFOLIO

GOAL: Design a focused, balanced and collaborative portfolio of research, development and adoption investments and initiatives that deliver tangible solutions and options to advance the productivity, sustainability, profitability, and long-term growth prospects for the Australian sugarcane industry.

SRA has a strong portfolio of research that delivers value and return on investment to the industry, achieved through a Research Missions approach.

Read more about our Research Missions on page 50.

$28.1 million investment across the five research missions.

The chart on the right shows the 2022/23 investment of $28.1 million in RD&A activities across the SRA's five research missions, excluding $7.4 million in other and corporate support initiatives.

RESEARCH MISSION	MILLION
1. Profitable and productive	$16.0M
2. Resilient and enduring	$5.2M
3. Diversified and adaptable	$0.9M
4. Wealth generating through land stewardship	$5.0M
5. Skilled for the future	$1.1M
TOTAL INVESTMENT	**$28.1M**

Numbers are rounded

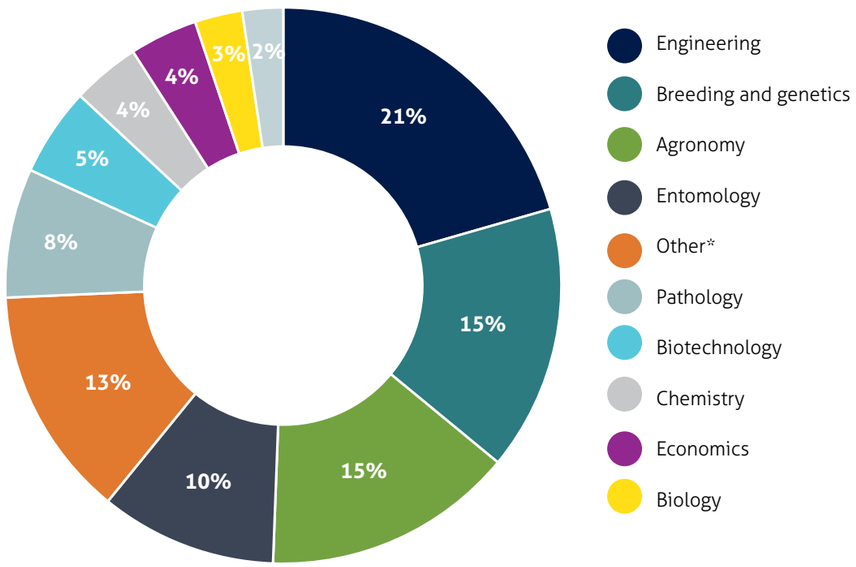
Almost
100
research partners
SRA collaborated with almost 100 partners on investments during 2022/23 including 28 co-investment partners.

11
research scholarships
Funding towards 11 research scholarships for postgraduate and undergraduate positions to build industry capability.

180
research investigators
from a diverse range of disciplines.

38
research papers
published and nine submitted for publishing in 2022/23.

Research disciplines of funded investigators



Numbers are rounded.
**Other includes Soil health, mathematics, computer and data sciences, and adoption/ extension.*

Research impact

SRA routinely commissions independent assessments of the efficiency and effectiveness of RD&A investments as part of our commitment to monitoring and evaluation, and to demonstrate impacts delivered to levy payers and regional communities.

In 2022/23, SRA commissioned 11 impact assessments on previous RD&A investments using benefit-cost analysis and the Rural Research and Development Corporation Impact Assessment Guidelines.

- Five assessments on core RD&A investments were completed by ACIL Allen.
- Six assessments on contestable investments, jointly funded by SRA and the Queensland Government's Department of Agriculture and Fisheries, by Marsden Jacobs Associates. Results of these were not available at the time of writing and will be reported at a later date.

Ex-post analysis of SRA's industry services, such as the pathology laboratory and near-infrared spectroscopy (NIR) services, over the period of 2013/14 to 2022/23, indicate an aggregate benefit-cost ratio (BCR) of 72.8 to 1, considerably above SRA's internal performance target of 6 to 1. This means for every $1 of funding by levy payers and the Commonwealth Government, SRA returned $72.8 of economic value to the sugarcane industry.

In some cases, a monetary benefit could not be quantified such as with SRA's entomology program and chemistry laboratory service. In these instances, benefits were described qualitatively.

Going forward, impacts will be evaluated when new technologies from entomological research are deployed to industry and environmental impacts, such as contribution to water quality improvement by reduced runoff, delivered by the chemistry laboratory, can be valued.

Example of Impact Assessment on SRA's Near Infrared Spectroscopy (NIR) Service for milling companies:

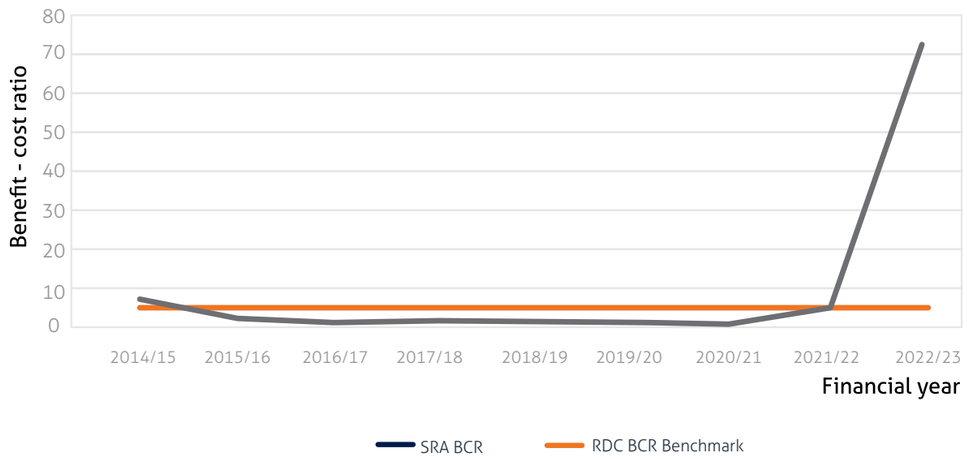
Investment	Service	Impact
SRA invested $3.9 million to run the NIR service and related research between 2013/14 and 2022/23	SRA's NIR service provides companies with an automated Cane Analysis System (CAS) that utilises SRA technology and an online NIR instrument to measure brix, pol, fibre, commercial cane sugar (CCS) and other parameters, every ten seconds. The service automates this process for companies who would otherwise need to employ staff to manually perform this work. Moreover, it provides real time information that enables management of cane feedstocks and the fine tuning of milling processes. SRA's NIR research is focused on maintaining the performance of the monitoring systems, expanding the application of the technology, and producing results that can inform both farming and milling practice improvement for productivity gains.	The assessment estimated the present value of SRA's NIR service and research for the evaluation period to be $46M in productivity gains. Of this, approximately 60 and 40 per cent of the benefit is distributed to milling companies and growers respectively, reflecting the value delivered across the sugar value chain. The net present value (removing investment by SRA) is $42M delivered to industry and the benefit-cost ratio is $11.3 to $1. Results were calculated as follows. The NIR service delivers an economic impact derived from wage savings for milling companies. This is based on a comparison of the efficiency benefits of NIR relative to traditional methods of cane analysis, resulting in fewer staff required to perform the analysis. It was estimated that each mill requires two fewer staff to conduct analysis, providing a wage saving of $96,000 per year. The total cost saving across the 10 mills that use NIR is estimated to be $965,000 per year. The economic impact of NIR research is shared by both growers and milling companies. For growers, productivity benefits arise from the accuracy and efficiency of NIR analysis and reduced cost to develop new cane varieties. For millers, benefits arise from wage cost savings and from faster analysis of fibre content of feedstock, which enables time to be allocated towards moisture testing thereby reducing energy costs. The productivity gain for both growers and milling companies is assumed to be 0.2 per cent using a base case because there was no available data on the impact of NIR testing.

Source: Cost Benefit Analysis of Selected Research Programs by ACIL Allen

High return on investment

Historically, the current result demonstrates SRA's investment in past RD&A activities is increasing in efficiency. The 2022/23 result, of 72.8, result is substantially higher than the previous year which recorded $5.7 to $1. The improved result is explained by the inclusion of assessments on core research activities such as SRA's Pathology Laboratory Service reflecting the large benefits delivered directly to industry by these investments.

Aggregate benefit-cost ratio of RD&A investments



SRA's aggregate benefit-cost ratio is based on 73 impact assessments undertaken between 2014/15 and 2022/23.

Note: SRA's aggregate benefit-cost ratio is based on 73 impact assessments undertaken between 2014/15 and 2022/23.

Previous impact assessments are available on SRA's dedicated research impact page via the SRA website.

Moreover, to demonstrate transparency about the performance of its research portfolio, SRA has reported the maturity of technologies using Technology Readiness Levels (see Research Missions 1-5 on pages 60-68).

Outcome Measures

Target	Details
50 per cent of SRA's portfolio involves cross sectoral/multidisciplinary research by 2024	In 2022/23, approximately 60 per cent of SRA's research portfolio involved cross-sectoral and/or multidisciplinary projects, a small decline of five per centage points from the previous year.
Impact of research programs on industry profitability, productivity, and sustainability	In 2022/23, 11 impact assessments using benefit-cost analysis were completed on R&D investments. Results from six assessments were not available at the time of writing, however, those investments that could be quantified recorded a high aggregate return on investment ratio of $72.8 to $1 based on strong economic benefits delivered to industry. This brings SRA's long-term aggregate ratio to $10.3 to $1 based on 73 assessments since 2014/15.
More than 80 per cent of partners and investors satisfied with SRA	In 2022/23, 85 per cent of research investors and partners reported satisfaction with SRA's overall performance, an increase of five per centage points from the previous year.
Annual uplifts in awareness of, and engagement in, R&D activities measured by survey results and response rates	In 2022/23, 71 and 88 per cent of growers and millers reported awareness of SRA's research investment planning, an unchanged result for growers and an 8-per centage point decline for millers from the previous year. Moreover, an average of 74 and 88 per cent of growers and millers were aware of SRA's research portfolio programs, a decline for growers of 11 per centage points and an increase for millers of seven per centage points from the previous year.
Increase in the total factor productivity growth in sugarcane agriculture over time relative to a baseline year	Progress on this measure will be reported in future annual reports.
Economic contribution of the sugarcane industry to the regional, state and national economy	Progress on this measure will be reported in future annual reports.

Sources: SRA; SRA's 2023 Grower and Miller Survey Reports by Intuitive Solutions; and Cost Benefit Analysis of Selected Research Programs by ACIL Allen.

PILLAR 3:
TRANSLATIONAL EXPERTISE

GOAL: Translate research findings into tools, products and services that save industry time and money, and improve environmental performance.

SRA undertakes broad engagement with industry and stakeholders to improve performance across its five districts.

Case Study

From March to June 2023 more than 60 growers graduated from SRA's free Online Sugarcane Nutrient Management (OSNM) training program and more than 140 growers enrolled.

Based on the SIX EASY STEPS® workshops, the OSNM program has been developed for sugarcane growers to refresh or up-skill their knowledge of nutrient management for sustainable sugarcane production.

A series of hybrid workshops which combined face-to-face learning of nutrient management principles, practical demonstrations, and support for growers were held in Ingham, Mackay, Bundaberg, Mossman and Tully, with more scheduled throughout 2023.

A grower who successfully completes the Online Sugarcane Nutrient Management training program can be considered an Appropriate Person under the definition of the Queensland Government's Reef protection regulations. They will be able to develop and verify their own farm's nitrogen and phosphorus budget (N&P budget) without needing to seek outside agronomic assistance.

The online program's development was funded through the Queensland Government's Queensland Reef Water Quality Program and SRA.

The development of the SIX EASY STEPS Sugarcane Nutrient Management Program commenced as part of the CRC for Sustainable Sugarcane Production. Its development and ongoing improvement has involved a multiorganisational collaboration led by Prof. Bernard Schroeder.

Engagement

In 2022/23, SRA staff engaged 1,019 industry stakeholders, an increase of 290 stakeholders from the previous year.

Engagement activities sought to achieve a range of strategic objectives including but not limited to identifying research priorities and productivity constraints and delivering Field Days and workshops to support adoption.

Staff recorded a total of 602 engagements across districts, a decrease from 754 reported the previous year, though these were more targeted in 2022/23 with an increase in farm visits and SRA-run events in response to industry feedback.

Feedback from stakeholders suggests there is a strong perception of engagement by SRA staff with industry. In 2022/23, 66 per cent of growers, 53 per cent of millers, and 76 per cent of research investors and partners rated SRA staff as very active or active in engaging in industry matters and events.

Queensland Government

This project is funded by Sugar Research Australia and the Department of Agriculture and Fisheries.

District Productivity Plans

District Productivity Plans identify the local issues and activities across the six regional districts to improve local productivity and profitability. They outline the tools, products and services that are available locally, to save the industry time and money. These adoption activities and engagement events effectively bridge the gap between research and implementation and practice on farm.

Far North

INITIATIVE	COLLABORATORS	PROPOSED OUTCOME	STATUS - JUNE 2023
Mulgrave and Mossman CCS Improvement Projects	CANEGROWERS Cairns Region, MSF Sugar and Mulgrave growers.	Improved CCS through monitoring and measuring crop indicators. Development of new datasets. Identification of management strategies.	Mulgrave on-farm review completed. Pachymetra survey completed. Row profile sampling in Mulgrave and data review ongoing.
	CANEGROWERS Mossman, Far Northern Milling Pty Ltd, Mossman Agricultural Services and Mossman growers.	Identify the impact of current practices on CCS, including on extraneous matter.	Mossman project commenced in February and ongoing.
Development of application parameters for ripeners	MSF Sugar, Far Northern growers.	Develop in-field parameters to support successful applications of sugarcane ripeners to improve profitability.	Year 1 results shared with Far Northern industry at March 2023 SRA update events. 2023 sites selected, treatments applied and monitoring ongoing. Strong linkages to CCS improvement projects.
Strategies for emerging weeds	Nufarm, Queensland Department of Agriculture and Fisheries, Federation University and Far Northern growers.	Investigate efficacy of herbicides registered for vine control and aerial application. Identify and develop germination protocols for itch grass to support pot trials. Develop management strategies for post-emergence of balsam pear, itch grass and navua sedge.	Year 1 results shared with Far Northern industry at March 2023 SRA update events. Balsam pear trial #3 completed. Other vine species trial completed. Navua sedge monitoring ongoing at two sites. Collection of itch grass seeds for germination protocol development underway.

North

INITIATIVE	COLLABORATORS	PROPOSED OUTCOME	STATUS - JUNE 2023
Local Expert Analysis (LEA) South Johnstone	Innisfail Babinda Cane Productivity Services, Innisfail CANEGROWERS, local growers, MSF Sugar, Cassowary Coast Reef Smart Farming Project and local industry organisations.	A lift in productivity through improved management of Pachymetra root rot, RSD, plant nutrition (including Calcium, Silicon) and increased adoption and exploitation of higher yielding resistant varieties.	Constraints/opportunities identified through the LEA are currently being implemented through on ground activities in collaboration with growers, MSF, Innisfail CANEGROWERS and Innisfail Babinda Cane Productivity Services. Meeting to update current progress with the core LEA group held in May.

North (continued)

INITIATIVE	COLLABORATORS	PROPOSED OUTCOME	STATUS - JUNE 2023
Local Expert Analysis (LEA) Tully	Tully Cane Productivity Services Ltd, Tully CANEGROWERS, Tully Sugar.	Improved profitability through balanced crop nutrition, targeted use of mill by-products, automated mill alerts for poor yielding crops, better disease management, improved use of NIR to indicate crop status, and validation of Harvest Mate for optimising harvesting economic outcomes.	Currently conducting stakeholder engagement meetings to review Tully Productivity Plan.
Variety observation plot and CCS maturity profiling	SRA Plant Breeding.	Variety demonstration plot and CCS maturity profiling.	Completion of CCS maturity curve data analysis for standard varieties, newly released varieties, and accelerated clones for 2022 season. Data was presented at the 2023 Regional Variety Committee meeting, Herbert Field Day and published in the Herbert Variety Guide 2023/2024. Continuation of the CCS maturity curve sampling to be conducted during the 2023 season. First samples were collected during May.
Sterilisation unit for harvesting	Fire Suppression Services QLD PTY LTD.	Prototype automatic spray unit to clean a commercial harvester to minimise RSD transmission.	Unit installed and tested during the 2022 harvest season. Modifications currently being scoped and if successful a second unit will be installed and tested in 2023.
Refining nutrient recommendations for ratoon crops following application of surface banded mill by-products to manage the effect on yield and CCS	Wilmar Sugar Australia.	Improved understanding of nitrogen requirements to manage CCS following application of mill by-products.	One trial implemented at the Orient - mud/ash was subsurface banded in fallow at 80 wet t/ha and then planted. Sampling of this trial conducted in June. Second trial to be implemented 2023 harvest season, banded application on ratoon cane.
Herbert temporal nitrogen trial	University of Southern Queensland.	Generating cane yield and nitrogen uptake response curves for different enhanced efficiency fertiliser (EEF) products.	Data compiled and presented during the off-season. Additional information was presented at the Herbert Field Day.

Burdekin

INITIATIVE	COLLABORATORS	PROPOSED OUTCOME	STATUS - JUNE 2023
Burdekin Irrigation Project (BIP)	Burdekin Productivity Service (BPS), Agritech Solutions, Farmacist, Burdekin Bowen Integrated Floodplain Management Advisory Committee (BBIFMAC), James Cook University, Department of Agriculture and Fisheries, North Queensland Dry Tropics, Wilmar and growers. In-kind from Sunwater.	Reduce energy costs, improve water costs and irrigation efficiencies. Measure water quality benefits. Modernisation of farming systems e.g. smart farming technology.	
Reducing herbicide usage on farm with precise weed control	Autoweed, James Cook Univeristy, Queensland Department of Agriculture and Fisheries.	Reduce herbicide use by comparing efficacy of weed control and evaluate economic savings.	A new trial site has been established to trial the equipment on two different herbicides. The new site has had initial data imagery collected. Department of Agriculture and Fisheries economics team have begun a case study on the Robotic Spot Sprayer to evaluate economic savings.
Burdekin phosphorous response trial	Wilmar and Burdekin Productivity Services	Investigate P management for sugarcane crops growing in alkaline soils.	A second trial site has been established in the BRIA area. Site has had soil samples taken; nutrients applied subsurface preplant by way of a prescription application. Cane has been planted and well established.
Mill mud/ash trials in outer regions of the district	Queensland Department of Agriculture and Fisheries	Measuring economic impact of applying low rates of mill mud/ash.	Trial plan developed, growers engaged, and mill mud ash pads established. No mud has been applied due to weather conditions and unavailability of spreading equipment.

Central

INITIATIVE	COLLABORATORS	PROPOSED OUTCOME	STATUS - JUNE 2023
Increasing irrigation utilisation	Productivity services companies, growers, Mackay Sugar, local water boards, government bodies.	Increase utilisation of irrigation to increase profitability and productivity. Note: Seeking more growers to work with in the irrigation space.	Demonstration sites have been established using low- cost scheduling and system control tools. Continuing to offer growers with system assessments/ benchmarking using CaneCalcs, providing advice on irrigation system design/operation and ongoing support with irrigation scheduling. Working with stakeholders to develop a major irrigation utilisation project in the region.

Central (continued)

INITIATIVE	COLLABORATORS	PROPOSED OUTCOME	STATUS - JUNE 2023
Supporting complementary fallow cropping	Productivity services companies and growers.	Improve productivity by breaking the monoculture and increasing profitability with a complementary cash crop.	The SRA soybean planter has been returned to service and is available to growers to trial complementary fallow crops. Several paddocks successfully planted to date – through trash, ratoon drills and cultivated beds. Two growers who used the planter have successfully taken their crop through to grain profitably.
Improving Early CCS: Variety observations	SRA Variety Development	Improve knowledge of varieties, particularly regarding early CCS and the impact of soil moisture on CCS.	Plots have been selected, soil moisture monitoring has been installed and fortnightly sampling commenced targeting a suite of upcoming clones in SRA Variety Development's Final Assessment Trial program.
Improving Early CCS: Crop Ripener	Productivity services companies and growers.	Improve CCS when cane is harvested earlier in the season.	Assisting local growers to assess paddocks for the application of crop ripener to improve CCS. Samples from paddocks are collected and processed with the mobile maturity trailer to determine crop moisture to aid in decision making.

Southern and NSW

INITIATIVE	COLLABORATORS	PROPOSED OUTCOME	STATUS - JUNE 2023
Local Expert Analysis (LEA) Bundaberg/Wide Bay	Productivity boards and mills.	Identification of unrealised industry constraints.	Initial phase is underway. Working with stakeholders to obtain nutrient management data. Soil and Leaf survey samples obtained and awaiting results.
Rocky Point Pest and Disease Management Surveys	Rocky Point CANEGROWERS	Reduced impact of RSD and Pachymetra on farm. Further extend and promote benefits of clean seed scheme and farm hygiene.	Rocky Point Productivity Workshop held - results of RSD and Pachymetra surveys presented to industry. The Southern RSD Management Plan launched.
NSW multi-year productivity program	NSW Agricultural Services, NSW Sunshine Sugar	Improved profitability and productivity through various projects including harvesting increasing the area of one year old harvested cane..	Discussions with NSW Sunshine Sugar on a productivity improvement program. Initial project scopes under negotiation.
SIX EASY STEPS® Online Sugarcane Nutrient Management Program	Department of Environment and Science CANEGROWERS	Enable all Australian sugarcane growers to have access to nutrient management training that will improve the efficiency and productivity of their farms if applied.	Online training has been launched to all Australian sugarcane growers. Registration access is available via SRA website.

Outcome Measures

Target	Details
By 2026, 75 per cent of levy payers are satisfied with SRA products, services, and varieties	In 2022/23, 72 per cent of growers and 68 per cent of millers reported satisfaction with SRA's overall performance, representing an increase from the previous year of five and three per centage points respectively.
By 2023, 75 per cent of surveyed growers have awareness of SRA's research programs and outcomes	In 2022/23, on average 24 per cent of growers reported familiarity with research programs and outcomes based on ten program areas, representing a decrease of ten per centage points from the previous year; however, the current measure included more programs for rating.
By 2026, 75 per cent of industry participants surveyed will rate SRA as a trustworthy organisation	In 2022/23, 74 per cent of both growers and millers reported that they were satisfied with SRA's District Managers and Translational Researchers, representing an increase of 18 and three per centage points respectively.
By 2026, the impact of SRA's industry services activities will contribute to industry productivity gains of up to ten per cent per district	In 2022/23, a benefit-cost analysis of SRA's Industry Services estimated SRA's NIR service and research delivers both wage cost savings and productivity gains valued at $965,000 and $2.6 million per year, respectively. Moreover, SRA's Pathology Laboratory delivers a productivity gain of 5.3 per cent in avoided production losses from the RSD disease. This equates to $10 million and $15 million to milling companies and growers, respectively in annual economic benefits.
Year-on-year expansion of self-serve, digital and automated service delivery options to strengthen engagement and communications reach	In 2022/23, SRA expanded self-service, digital products available to growers, millers, and other industry stakeholders, including the online Sugarcane Nutrient Management Training, Harvest Mate app, and the Agri-Climate Outlooks funded by SRA and partners. Commencement also began on the development of factory training modules as part of Phase 3 of the Australian Sugar Industry Training Program.
By 2024, calibration and screening services will be cost neutral	Progress against this measure will be reported in future annual reports.
By 2026, 20 per cent of the total commercial production will be from new varieties (calculated as an average across all regions)	In 2022/23, results based on the 2022 crop suggest 6.4 per cent of total production was from new varieties. Based on approved seed sales this value is expected to continue to increase towards the 2026 target.

Sources: SRA; Cost Benefit Analysis of Selected Research Programs by ACIL Allen; and SRA's 2023 Grower and Miller Survey Reports by Intuitive Solutions.

PILLAR 4:
WORLD-CLASS SUGARCANE VARIETIES

GOAL: Accelerate innovation in variety development to offer varieties that underpin the success of the industry's current and future product objectives, crop production and protection.

Varieties are a signature part of SRA's work to improve the productivity, sustainability, and competitiveness of Australia's sugarcane industry.

The 2023 Plant Breeding Rights (PBR) portfolio comprises 69 registered varieties representing more than 95 per cent of commercial production. Seven new varieties have provisional PBR protection.

Early in the plant breeding program, clones are produced but SRA cannot predict how they might perform. As breeding selection progresses, SRA learns more about a range of factors that positively and negatively affect variety performance.

SRA's Variety Development Managers are responsible for regional selection programs to test new and experimental clones from inception to final assessment on commercial farms.

Performance information for elite candidates is presented to Regional Variety Committees, which make decisions on the final stages of the variety release pipeline (i.e. Accelerate, Maximum Propagation and Release).

Regional Variety Committees

New varieties are released with the approval of Regional Variety Committees (RVC). Membership comprises of grower and miller representatives, with meetings attended by productivity services organisations, agronomists and interested growers.

Performance data from field trials, disease resistance screening, fibre and sugar quality testing, and agronomic observations for new variety candidates are reviewed against established varieties, newly released varieties, and advanced prospects in the breeding pipeline.

Approval to release a variety requires unanimous support from the RVC voting members, with the decisions and supporting data subsequently published in the SRA Variety Guides.

RVCs have a key role in industry biosecurity, responsible for maintaining minimum disease resistance thresholds for new varieties, as agreed with the Sugarcane Industry Biosecurity Committee. Growers demonstrate compliance with their General Biosecurity Obligation under the Queensland *Biosecurity Act* by growing only varieties approved by the RVC. Changes to the RVC approved lists for planting and ratooning are published in the SRA Variety Guides.

The following new varieties were approved for release by RVCs in 2023:

Name	SRA40$^{\phi}$
Region	Herbert and Central
Pedigree	CP70-1547 x QA96-1492
Attributes	A strong disease profile includes resistance to leaf scald, smut, Pachymetra, and mosaic virus, but brown rust susceptibility is similar to Q253. SRA40$^{\phi}$ exhibits high yield and lower CCS equating to a sugar production per hectare better than Q232$^{\phi}$ in the Herbert and Q208$^{\phi}$ in Central Region field trials.

Name	SRA41$^{\phi}$
Region	NSW
Pedigree	Q170 x QC90-289
Attributes	In field trials harvested from 2017 to 2022 SRA41$^{\phi}$ has exhibited similar cane yield to Q208$^{\phi}$ while averaging half a unit higher CCS. SRA41$^{\phi}$ is resistant to smut, Fiji leaf gall, leaf scald, and Mosaic while having an intermediate to resistant rating for Pachymetra.

Local performance data for varieties released in other regions is also considered at RVC meetings. SRA conducts an interstation exchange program, ensuring new varieties are available for field trials in other regions, one year before their local scheduled release.

In 2022, two varieties were approved for production in additional regions. The leading candidates for broad scale adoption are:

- SRA26$^{\phi}$ – Burdekin approval was added to Northern, Herbert, and Central regions
- SRA27$^{\phi}$ – Burdekin approval was added to the Northern region (Tablelands only).

Driving efficiency

The Variety Development business unit consolidated breeding, farms and disease screening departments to lower costs and support improved effectiveness of plant breeding. The early generation selection stages for the Central and Southern selection programs were merged to improve efficiency. The revised approach continues to feature parent selection and crossing specifically for the Southern region, but the progeny assessment has moved from the Bundaberg station to be integrated with the Central region at Mackay.

Selection of clones for the Southern region will continue to reflect the local breeding priorities and relative economic genetic value. Breeding activity in the South will focus on Final Assessment Trials (FAT) conducted on commercial farms to generate performance data for variety release and grower adoption decisions. Propagations to support local trials, disease screening, and the NSW program will continue, as will screening of clones from all regions for fibre quality.

The restructure of plant breeding has delivered a significant cost reduction. The net expenditure for 2022/23 in Variety Development was a 10 per cent reduction in real terms compared to the 2019/20 baseline, which meets the SRA Strategic Plan target.

Improving disease resistance

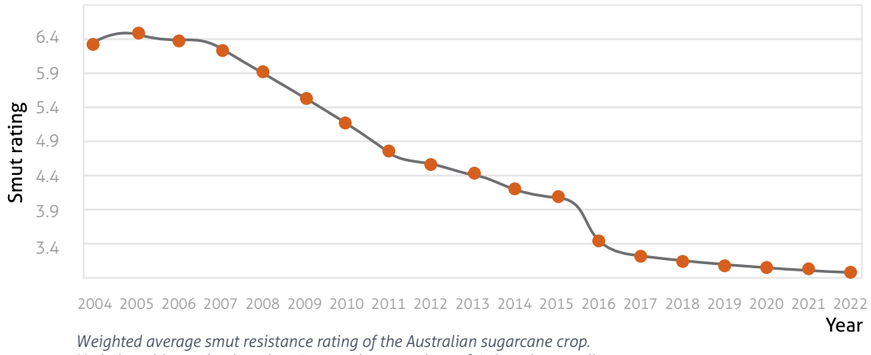
Smut resistant varieties

The Australian sugarcane crop with a high weighted average resistance rating of 6.4 was susceptible to smut when the disease first arrived in 2006.

In 2022, the average rating had decreased to 3.42, providing significant risk mitigation for the whole industry. While major crop losses to smut are now rare, the disease remains present. Under favourable conditions infection of varieties with intermediate resistance is common.

The recent release of high yielding varieties with strong resistance to smut provides growers with effective protection even where high disease pressure exists. The level of smut resistance across the crop is expected to continue to improve as intermediate varieties such as Q200(f) and Q208(f) are replaced by new resistant varieties.

Weighted average smut rating



Weighted average smut resistance rating of the Australian sugarcane crop. Varieties with a rating less than 3 are resistant, ratings of 4-6 are intermediate, and above 6 are susceptible.

The significant and sustained reduction in the weighted average rating (above) illustrates the successful plant breeding response and industry adoption of resistant varieties.

The frequency (%) of smut resistant and susceptible clones in Final Assessment Trials

Selection for smut resistance remains a high plant breeding priority. Significant effort is put into identifying susceptible candidates, which can be discarded before promotion into Final Assessment Trials (FAT).

Following the recommendations of the 2017 Plant Breeding review, SRA developed the technology to use molecular markers to screen for smut resistance prior to seedlings being planted in the field, and the inoculation of breeding trial propagations with smut spores to identify susceptible individuals.

Combined with the established screening program conducted at Woodford, these approaches support continued improvement in the frequency of smut resistance as shown on the previous page.

The number of clones susceptible to smut in FATs was reduced to less than 2 per cent for the first time in the 2021 trial series. Maintaining at least this level of resistance in the breeding program means SRA can release future varieties that meet grower requirements for smut resistance.

Combining disease resistance with improved productivity

The soil-borne fungus *Pachymetra chaunoriza* causes economically important yield losses in susceptible and intermediate rated varieties. The damage to root systems from the pathogen can also compromise milling quality through plant stools entering the cane supply.

Varieties with effective resistance to Pachymetra have been available to growers for some time, yet combining this trait with smut resistance and improved productivity has been a significant plant breeding challenge.

In recent years, SRA has invested to increase the capacity of Pachymetra resistance screening. This change allows germplasm in the breeding pipeline to be screened earlier in the selection process, with initial results now available prior to clones being progressed into Final Assessment Trials.

In the 2021 trial series, the frequency of Pachymetra susceptible clones was reduced to 2 per cent while the level of resistant clones increased to 72 per cent. The increased frequency of disease resistance allows greater selection pressure for productivity gains in the later stages of the breeding program, while increasing the probability of releasing varieties with resistance to both smut and Pachymetra.

Frequency (%) of Pachymetra resistance in experimental clones in Final Assessment Trials

Improving genetic gain

SRA uses a range of population genetics measures to monitor underlying rates of genetic gain, one of which is a simple count of elite clones.

How experimental clones perform in terms of cane yield, commercial cane sugar (CCS), disease resistance and appearance grade (in some regions) is consolidated into a selection index of relative economic genetic value (rEGV). The weightings of the traits in the rEGV index are different for each region, reflecting the drivers of profit and cost as agreed by levy payers and approved by the Australian Sugar Industry Alliance (ASA).

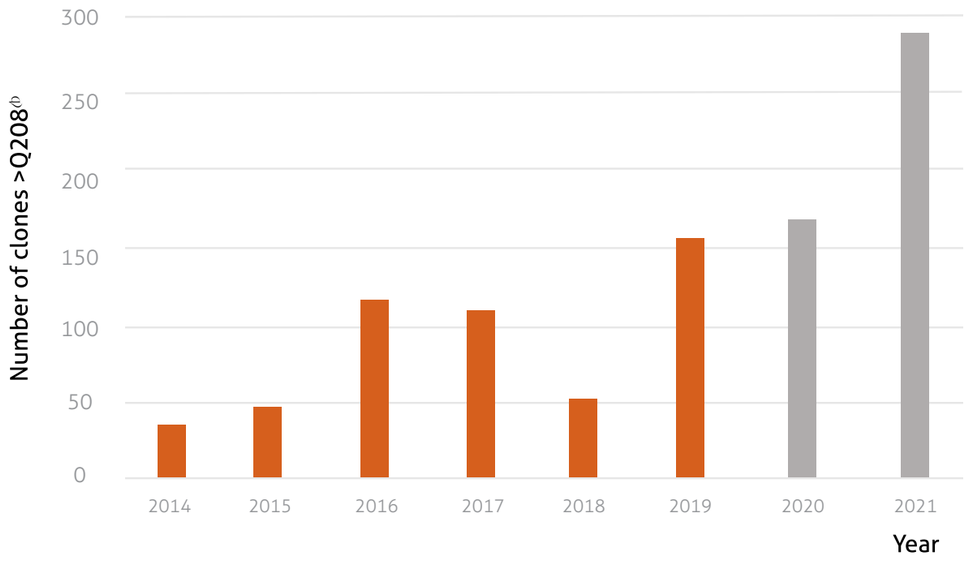
The performance of experimental test clones is compared with a panel of established reference varieties, providing a stable comparison basis over different seasons. The rEGV index reflects whole of industry profitability, balancing benefit to growers and millers.

The number of experimental clones with higher industry profitability than the reference variety Q208Φ, is shown below.

In the 2014 FAT series, there were 35 clones superior to Q208Φ indicating a modest probability of releasing varieties that will drive productivity improvements. The number of elite clones increased to 157 in the 2019 trial series which is now completed with the collection of second ratoon performance data.

Both the 2020 and 2021 trial series have further data to be collected, however the data indicate that the strength of the germplasm pipeline is significantly improving, and the outlook is strong for the commercial merit of varieties to be released during the Strategic Plan 2021-2026.

Frequency of elite clones in Final Assessment Trials defined as individuals with a relative economic genetic value greater than Q208Φ



The naming of trials follows the year of planting. Plant crop performance data for the 2021 series was collected in 2022.

Variety adoption

Maximising profitability and minimising risk by adopting a balanced mix of varieties across a farm with various productivity constraints, disease pressures, and harvest timing can be a complex task.

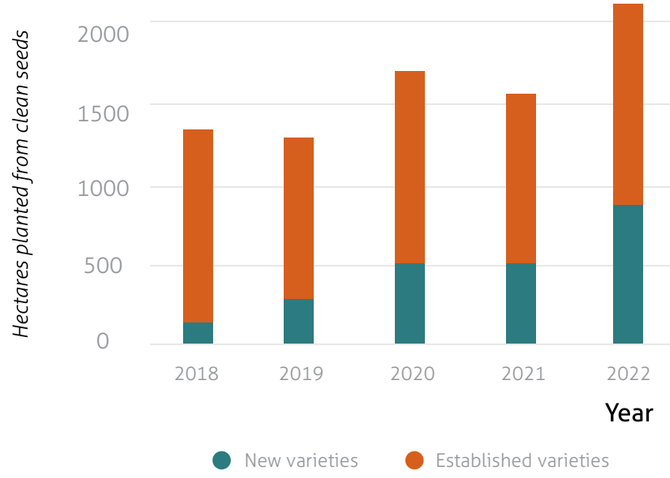
Planting successful established varieties offers a low-risk option given the high cost of crop establishment and the impact on profitability across multiple years. New sugarcane varieties must offer increased productivity and/or reduced disease risk to become adopted.

In 2022 total sales of approved planting material increased by 34 per cent from the previous year. Sales of new varieties increased by 66 per cent compared to 2021, equating to an additional 350 hectares planted to new varieties in 2022. The proportion of new varieties also reached a record high of 41 per cent of total sales.

Sugarcane planting material is sold in several formats. Billets are increasingly replacing whole stick planting and the use of tissue culture is increasing, particularly in the Herbert and Northern regions. The various forms of planting material are converted into area planted using industry standard rates to allow all approved seed sales to be reported as a consolidated area value.

The most popular varieties in order of sales volume in 2022 were SRA23Φ, SRA26Φ, WSRA17Φ, SRA28Φ, SRA21Φ, SRA9Φ, and SRA29Φ. The distribution of sales shows the increase in demand is spread across regions and there is a portfolio of new varieties being adopted by growers.

Trend over time for approved seed sales of sugarcane varieties



Satisfaction with varieties

The grower survey sought feedback on SRA's variety development program, perceptions about new varieties and what most influences growers' variety selection.

Grower satisfaction with varieties and distribution mechanisms was as follows:

- Distribution of cane from local plots – 79%
- Information about Variety performance and selection – 80%
- Value of varieties to the farm business – 67%
- Quality of new varieties – 55%

Grower decisions about variety selection are most strongly influenced by:

- Personal experience – 97%
- Local productivity boards – 83%
- Other growers in the local area – 78%
- SRA Variety Guide – 76%

Asked what new varieties growers intend to increase in commercial production, the following were most popular (noting not all varieties are available in all districts):

- SRA26$^{\Phi}$ - 30%
- SRA28$^{\Phi}$ – 16%
- SRA22$^{\Phi}$ – 7%
- SRA37$^{\Phi}$ – 6%
- SRA9$^{\Phi}$ – 20%
- SRA29$^{\Phi}$ – 9%
- SRA21$^{\Phi}$ – 7%

Feedback reinforced the regional spread of new high performing varieties and were generally consistent with the 2022 seed sales. The importance of investment in developing new varieties and generating local performance data was the strong message from growers in their responses to the survey.

Outcome Measures

Target	Details
By 2026, develop an efficient plant breeding program - achieve planned genetic gain at an allocation of 50 per cent levies (not including pre-breeding R&D investment), whilst achieving targeted genetic gains of two per cent year-on-year	In 2022/23, net expenditure is forecast to be $722,000 less than the target of 50 per cent of industry levies. Long term genetic gain has increased from 0.04 per cent in 2017 to 1.03 per cent in 2022.
By 2023, SRA will be positioned to reduce variety development costs by 10 per cent from the 2020 baseline	The 2022/23 budget for the Variety Development business unit represents a 10 per cent reduction in net expenditure in real terms compared to the 2019/20 baseline.
By 2026, SRA will be positioned to reduce variety development costs by 15 per cent from the 2020 baseline (five per cent incremental savings)	The 2023/24 budget for Variety Development maintains the lower cost base established through the restructure and remains significantly below the value of 50 per cent of industry levies.
By 2025, SRA's breeding capabilities will be leveraged to develop strategic partnerships and commercial returns.	Progress against this measure is tracking as expected and will be reported on in future annual reports.

Source: SRA

Farleigh Mill, Mackay.

PILLAR 5:
COMMERCIAL BENEFITS AND REWARDS

GOAL: Take our research work and investments to the next level by securing investors and funding and extracting commercial value from our intellectual property, research capability, facilities and strategic partnerships.

Commercial returns

In 2022/23, SRA received $823,133 in income for services and consulting and $498,140 for licensing of technologies.

Australian and Indonesian sugarcane industries collaboration In 2022/23, SRA and the Indonesian company, KPN Corp, worked towards an agreement (signed in September 2023) to establish a research and development collaboration between the Australian and Indonesian sugarcane industries. This will see six major Australian sugarcane varieties propagated in plantations across the Indonesian archipelago and monitored for their resistance to a range of pests and diseases in a frontline biosecurity effort to protect sugarcane production in Australia, a relatively short distance away.

Six current SRA varieties representing about 65 per cent of crop production in Australia are licensed for commercial production in Indonesia in a diverse range of environments and locations. This will enable SRA to assess the resistance of these varieties to exotic pests and diseases that are currently non-existent in Australia.

Under the license arrangements, regular reports will be provided to SRA on the varieties' resistance to pests and diseases in both propagations and commercial production. In addition, a production-based royalty payment will be paid which will be invested in the Australian sugarcane industry's research priorities.

Fee for services

SRA's laboratory services provide subsided diagnostic testing for Ratoon Stunting Disease (RSD), Pachymetra root rot and plant-parasitic nematodes, to identify and assist growers to manage and avoid production losses from these pathogens.

In 2022/23, these services completed almost 14,000 assays on plant material and soil samples, a similar result to the previous year. For RSD, service is estimated to deliver a productivity gain of 5.3 per cent in avoided losses. This equates to annual economic benefits of $15 million and $10 million to growers and milling companies respectively.

SRA also operates the Chemistry Laboratory that performs analysis on nutrients, residues, sugarcane quality and near infrared (NIR). In 2022/23, the service performed more than 16,400 assays, an increase of four per cent from the previous year. SRA's NIR service and research are estimated to deliver annual wage cost savings of 60 per cent for millers and productivity gains of 40 per cent for growers valued at $965,000 and $2.6 million respectively.

Commercial collaborations

In 2022/23, SRA received revenue from licensing See & Spray™ technology to John Deere. See & Spray uses vision-based precision spray technology and a targeted spray solution for weeds in fallow ground. The technology was developed from funding by SRA and the University of Southern Queensland, Horticulture Innovation Australia, and Cotton Research and Development Corporation.

Outcome Measures

Target	By June 2026, SRA will deliver net returns from commercial activities of at least $4M per annum.
Details	In 2022/23, SRA recorded $0.498M in net returns from commercialised technologies.

Source: SRA

Principal Research Scientist Dr Rob Magarey (right) at SRA's Tully station with CANEGROWERS Innisfail District Extension Officer Peter Becke unloading commercial tissue culture that generated $140k revenue in 2022/23.

RESEARCH MISSIONS

This section of the annual report outlines SRA's progress against key tactics, outcomes and success measures in the strategic plan in relation to our five Research Missions.

Mackay Sugar's Mechanical Reliability Engineer (Weighing/Feeding-Mills), Asset Services, Steve McLaughlin (left) and Farleigh Mill Maintenance Supervisor, Jason Howes, are pictured on top of the newly clad No. 6 roller at Farleigh Mill.

Mission 1: PROFITABLE AND PRODUCTIVE

Aim: Continuous improvement in farming and milling profitability

Objective: Increase ongoing competitiveness of the Australian sugarcane industry by supporting year-on-year improvements to productivity in aggregate at a regional level

Mackay grower and harvester contractor Nathan Grech and SRA Agricultural Machinery Specialist Phil Patane.

CASE STUDY

INNOVATIVE APP TO DRIVE IMPROVED SUGAR YIELD

After extensive trials, ***Harvest Mate*** is now helping growers and harvesting contractors make decisions about their harvester settings to increase yield from their paddocks.

An example of the collaboration between growers, harvesting contractors, Queensland's Department of Agriculture and Fisheries (DAF), and SRA, the Harvest Mate[1] web-based portal and App was developed to help growers extract the greatest possible value out of their harvest.

An initial research project aimed to understand the yield benefits and impact on harvesting costs when changing existing practices, and to identify the levers that could be pulled to predict optimal harvester settings. Based on these results, Harvest Mate uses growers' block and crop information, as well as harvester, haul-out, labour details and harvest conditions to inform the grower and harvesting contractor of optimal harvester settings.

The tool was demonstrated to industry through 11 regional face-to-face workshops during the 2022/23 financial year, and since the launch, 3.2 million tonnes of cane have been registered by growers.

The development of Harvest Mate exemplifies SRA and DAF's commitment to applying the latest research findings with economic outcomes in mind.

While growers continue to work hard on producing the best crop, Harvest Mate is helping to reduce cane and sugar loss during the harvest. And with an expected increase in productivity of approximately five per cent, Harvest Mate will also provide benefits to the mills and improve mill viability.

This case study was originally published in Cane **Matters** Winter 2023. *Read the full version here:* www.sugarresearch.com.au/resources-and-media/publications

Queensland Government

SRA acknowledges the invaluable research contribution by economists from the Queensland Department of Agriculture and Fisheries (DAF) for the development of this tool, as well as funding from DAF for its delivery.

[1]This project is funded by Sugar Research Australia and the Department of Agriculture and Fisheries

CASE STUDY

ROLL ARCING ON THE WAY OUT

Significant steps were taken towards an effective alternative to the conventional process of roll arcing in sugar mills, with both financial and health and safety benefits for the sector.

Roll arcing is both labour-intensive and a risk to the health and safety of crews. The heavy rotating machinery requires frequent maintenance, and is known to produce contaminants.

The need to eliminate roll arcing has been on the research agenda since the early 1990s.

Project 2019/007 *Eliminating Roll Arcing*, investigating alternative equipment and processes, was conducted to find the most cost-effective approach to eliminating roll arcing.

With funding by SRA, the trial was led by Chief Investigator, Queensland University of Technology's (QUT), Geoff Kent, with partners, Mackay Sugar and Wilmar Sugar. Also partnering was Australia's national science agency, CSIRO, who developed the laser cladding technology trialled in the program.

Application

- SG iron was used for shell material, with a tungsten carbide chip surface applied as a cladding on the tips. Both roots and flanks of the grooves were also clad to reduce undercutting and wear of the roll surface.
- Testing found a reduction in undercutting with SG iron shell material. However, the undercut region still needed to be repaired each season to avoid significant loss of roll diameter from the detachment of tooth sections.
- Yet because of SG iron's weldability, the teeth could be readily rebuilt, using a low-cost steel welding consumable, and the tungsten carbide surface reapplied.

Technology

- Cladding technology consisting of a portable 2 kW to 4 kW diode laser system with a robotic laser beam and a metal powder feeding system was tested - A process using minimal heat for faster cooling rates and much finer and denser microstructures than those produced by conventional processes.

Recommended coatings

Tip coating: Mild steel containing tungsten carbide chips of particle size 16 to 20 mesh, applied by MIG welding.

Life: The single weld tip coating on the very tip of the grooves had to be replaced yearly for grip in the subsequent year and to restore the original outside diameter of the roll.

Flank coating:

- Tetra V420-G (martensitic stainless steel, grade SAE 420)
- Robodur K600-G (medium alloy martensitic steel with finely dispersed spherical carbides) or,
- Hardface HC- O (high chromium cast iron deposit containing primary chromium carbides in an austenitic matrix)

*Applied by MIG welding

Life: two to three years.

Root coating: Austenitic stainless steel such as Tetra S 309L-G or Chromecore 309

Life: same as the life of the roll.

Benefits

The combination of an SG iron roll and coating the roll grooves with hard facing using tungsten carbide chips was estimated to reduce overall costs of maintaining mill rolls by more than $500,000 per year.

The health, safety and environment (HSE) benefits were smaller than expected relative to direct financial benefits, but were nonetheless attractive.

The process was deemed appropriate for application by all Australian sugar milling companies. Project progress was reported annually at the Regional Milling Research Seminars, together with two workshops held in Townsville.

This case study was originally published in Cane **Matters** Winter 2023. *Read the full version here:* **www.sugarresearch.com.au/resources-and-media/publications**

Mission 1 Research portfolio

PROJECT	SOLUTION DESCRIPTION	TRL* 1 - 2	TRL 3 - 4	TRL 5- 6	TRL 7 - 9
2017/002 Implementing and validating genomic selection in SRA breeding programs to accelerate improvements in yield, commercial cane sugar, and other key traits	Genomic selection software to increase breeding efficiency for SRA's Plant Breeding Program led by The University of Queensland (UQ)[2].			◆	
2018/005 Genetic analysis and marker delivery for sugarcane breeding	Molecular markers to increase breeding efficiency for SRA's Plant Breeding Program, led by the Commonwealth Scientific and Industrial Research Organisation (CSIRO).		◆		
2018/012 Pan design and operational changes to suit Australian pan stages operating on low pressure vapour	Pan stage design to reduce steam consumption to produce by-products for milling companies, led by Queensland University of Technology (QUT).			◆	
2019/002 Validating high-throughput phenomics technologies for sugarcane clonal selection	Phenotyping platform and method to increase breeding efficiency for SRA's Plant Breeding Program, led by SRA.			◆	
2019/005 Strategies to minimise impacts of processing existing soft cane varieties, and industry cost/ benefit analysis	Automated strategy for grid bar adjustment to process soft cane varieties more efficiently for milling companies, led by QUT.			◆	
2019/007 Eliminating roll arcing	Method to coat roll surfaces to reduce degradation and maintenance costs for milling led by QUT .			◆	
2020/003 Maximising cane recovery through the development of a harvesting decision-support tool	Decision support tool 'Harvest Mate' to improve yield and cane quality and manage costs for growers and harvesting contractors, led by SRA[3].				◆
2020/202 Improving pan stage performance by on-line monitoring of C seed grainings using the ITECA Crystobserver	Validation of the ITECA Crystobserver crystal microscope to improve C seed graining and improve sucrose recovery for milling, led by Sunshine Sugar.			◆	
2021/201 Use of a purge sensor to improve performance and reduce supervision of batch centrifugals	Validation of Neltec purge sensor to improve control of the fugal stage for milling companies, led by Bundaberg Sugar.		◆		
2021/202 At-line purity sensor to enhance the monitoring, control, and performance of pan stage	Validation of at-line purity sensor to improve performance of the pan stage for milling, led by WH Heck & Sons.		◆		

*Technology Readiness Levels. See page 71 for more information.

2. This project is funded by the Department of Agriculture and Fisheries and Sugar Research Australia.

3. This project is funded by Sugar Research Australia and the Department of Agriculture and Fisheries.

PROJECT	SOLUTION DESCRIPTION	TRL* 1 - 2	TRL 3 - 4	TRL 5- 6	TRL 7 - 9
2021/203 On-line measurement of the physical properties of each cane consignment at the factory	Machine learning system to measure billet length and extraneous matter for cane entering the mill, led by Tully Sugar Limited.		◆		
2021/204 Evaluate the operational performance and industry application for the final evaporator design at Victoria Mill	Validation of latest Sugar Research Institute designed evaporator when installed at the #5 position in mills, led by Wilmar Sugar Australia.			◆	
2022/014 Australian Sugar Industry Training - Development of factory training modules - Phase 3	Online sugar training modules for milling, led by QUT.			◆	
2022/201 Feasibility study of using mill waste streams by a 5ha micro-algae facility for supplemental income	Feasibility of micro-algae facility to use mill waste streams to generate supplemental income for milling led by Isis Central Sugar Mill.		◆		
2022/202 Optimising milling train extraction through added water control using online NIR cane and bagasse data	Algorithm to optimise milling train water addition to maximise sugar extraction for milling led by Tully Sugar Limited.	◆			
SRA Variety Development Program	Breeding activities including parent management, field trials, genetic analysis, drone-based selection, sugar and fibre quality testing, release of two new varieties (SRA40(b) and SRA41(b)), production of clean planting material, new variety promotion and marketing, led by SRA.				◆
District Productivity Plan activities	District activities such as Field Days and the Local Expert Analysis program to analyse unidentified farm productivity constraints data, led by SRA.	NA	NA	NA	NA
Near Infrared Spectroscopy (NIR) service	Activities including, but not limited to, rapid analysis of the quality and characteristics of crushed sugarcane and to automate cane payments, led by SRA.				◆

*Technology Readiness Levels. See page 71 for more information.

Mission 1: Success measures

MEASURE	DETAILS
Increased throughput – tonnes of cane per hectare	Throughput, as measured by average tonnes of cane per hectare (TCH), increased by 12.8 per cent from 2021 with an industry average of 99.4 TCH recorded for 2022. The rolling five-year average has increased by 2.4 per cent to 88.7 TCH.
Increased sugar per hectare	Tonnes of sugar per hectare (TSH) increased by 6.5 per cent from 2021 with an industry average of 12.6 recorded for 2022. The rolling five-year average has increased by 1.7 per cent to 12.1 TSH.
Rate of adoption of productivity-enhancing technology	In 2022/23, growers reported adoption of the following SRA technologies designed to increase productivity: ■ 88% reported that they use or plan to use SRA's Variety Guides to inform selection of new varieties to plant ■ 73% reported that they use or plan to use SRA's SIX EASY STEPS® nutrient management program ■ 61% reported that they use or plan to use SRA's Pathology Laboratory Service to assess plant material for disease
Number and value of elite clones	In the 2014 Final Assessment Trial series, there were 35 clones superior to Q208(f) which provides a modest probability of releasing varieties that will drive productivity improvements. The number of elite clones increased to 157 in the 2019 trial series which is now completed with the collection of second ratoon performance data. Both the 2020 and 2021 trial series have further data to be collected, however the available data suggest that the strength of the germplasm pipeline is significantly improving, and the outlook is strong for the commercial merit of varieties to be released during the Strategic Plan period of 2021 to 2026.
Reduce development cycle-times for the variety program	Experimental clones fast-tracked using tissue culture technology were evaluated in field trials in 2022/23. Genomic selection was applied for the first time to accelerate the time to release novel nematode resistance populations.
Value of milling process innovation	In 2022/23, a benefit-cost analysis on SRA's Near Infra-Red Spectroscopy (NIR) service and research, estimated the investment delivers both wage cost savings and productivity gains valued at $965,000 and $2.6 million per year, respectively. For the total evaluation period of 2013/14 to 2022/23, the service delivered an estimated total of $45.6 million in economic value (60 and 40 cent respectively, to millers and growers).

Mission 2: RESILIENT AND ENDURING

Aim: Position the industry to stay ahead of climate, environmental and biosecurity threats

Objective: Minimise and control risk to production from pests, diseases, weeds and climate / environmental threats

Dr Sriti Burman (UQ) shows Tully Cane Productivity Services Manager Peter Sutherland how the RSD-LAMP assay works.

CASE STUDY

NEWLY DISCOVERED NEMATODE MAY POSE BREEDING CHALLENGE FOR NEMATODE RESISTANCE

A risk assessment of a species of root-lesion nematode new to the Australian sugarcane industry, ***Pratylenchus parazeae***, is running until early 2024.

The new species was discovered in the Burdekin cane growing region through an SRA-led research project. The only other place where this nematode species has been found in sugarcane is in Guangxi, China, in 2015.

Dr Shamsul Bhuiyan, SRA Manager of Biosecurity and Disease Screening based at Woodford Station, is leading the research project to:

- Diagnose and isolate *P. parazeae* for a pathogenicity study
- Determine the pathogenicity of *P. parazeae* compared to *P. zeae*
- Determine whether breeding lines resistant to *P. zeae* are equally resistant to *P. parazeae*

Plant-parasitic nematodes are a significant pest of sugarcane, causing from 5 to 20 per cent yield loss at an estimated cost of more than $80 million in productivity annually. The most destructive pathogen of sugarcane is root-lesion nematode - *Pratylenchus zeae* - because of its ability to survive under diverse agroclimatic conditions and in all soil types.

Resistance to *P. zeae* is rare in commercial sugarcane in the Australian and other cane industries across the world. However, SRA identified several lines from *Saccharum spontaneum*, a wild relative of sugarcane, which possessed a high degree of resistance to *P. zeae*.

Subsequently, these genes were bred into 150 progeny, the majority of which showed high resistance to *P. zeae* in the glasshouse study at Woodford Pathology Research Station.

A study in China found the new root-lesion nematode, *P. parazeae*, could invade sugarcane roots and cause similar disease symptoms to *P. zeae*. A new nematode, such as *P. parazeae*, could pose a challenge in developing lesion nematode resistant varieties for the Australian sugar industry.

Due to the identical form and structure of *P. parazeae* and *P. zeae*, a new challenge for SRA scientists is to develop a pure population to study its ability to cause disease.

CASE STUDY

HIGH RETURN ON INVESTMENT FOR GROWERS AND MILLERS

SRA's research portfolio is targeted towards delivering tangible solutions that deliver real impacts for sugarcane growers, milling companies, and other industry stakeholders.

Each year, SRA and partners engage independent consultants to measure the economic, environmental, and social impact of previous research investments. This evaluation is essential for SRA's efforts to improve the performance of new research investments and their products and report the return on investment (ROI) made by levy payers and research investment partners.

The following findings are from a recent evaluation of SRA's Pathology Laboratory Service undertaken by Independent company, ACIL Allen, in April 2023.

SRA Pathology Laboratory Service

Ratoon Stunting Disease (RSD) is a bacterial disease that significantly reduces both the productivity and profitability of the Australian sugarcane industry.

The disease is problematic because it has no external symptoms and is easily spread in planting material and by mechanical cutting equipment. If planting material is diseased, then potentially the next four to five harvested crops arising from that individual planting will also be affected.

If a crop is infected, yield losses are estimated to be between 10-20 per cent for plant crops and between 15-35 per cent for ratoon crops in Queensland[4]. This results in reduced productivity for growers and downstream impacts to harvesting contractors and milling companies, in terms of lost production and decreased profitability.

For more than 30 years SRA has invested in research and testing to provide a solution for RSD via its pathology service. The subsidised service provides growers with a rapid assessment of the potential presence of RSD in plant material. If a positive result is detected, growers receive disease-free planting material and support from their local productivity services organisation to manage the disease.

Use of disease-free planting material is one of the main strategies for managing RSD together with: sanitation of cutting equipment with a suitable sterilant, termination of diseased crops (as appropriate from a financial perspective), and elimination of volunteer diseased cane in fallow land. In 2022, SRA's pathology service assayed more than 13,000 samples for RSD resulting in a mean incidence ranging from 1 to 25 per cent of diseased samples. Despite this, currently, only 40 per cent of growers use the service, and survey results suggest 69 and 52 per cent of growers and millers, respectively, are familiar with it.

A benefit-cost analysis estimates the service delivers a productivity gain of 5.3 per cent in avoided production losses from RSD. This equates to $15 million and $10 million to growers and milling companies, respectively, in annual economic benefits. For the total evaluation period of 2013/14 to 2022/23, the service has delivered an estimated $328 million in net present value (58 and 42 per cent, respectively, to growers and millers) and a return on investment of 68 to 1 for levy payers. The analysis also identified environmental benefits from managing RSD including longer ratoon cycles, resulting in an increased time before replanting with fewer cultivations. This estimate was derived from a comparison of yield with and without RSD based on a sample of regions. It calculated the cost of RSD in terms of production losses under the counterfactual scenario of no SRA service and the additional plant area infected, and current adoption of management practices.

[4]Magarey, R. C., et al. "Incidence and economic effects of ratoon stunting disease on the Queensland sugarcane industry: ASSCT peer-reviewed paper." (2021).

Mission 2 Research portfolio

PROJECT	SOLUTION DESCRIPTION	TRL* 1 - 2	TRL 3 - 4	TRL 5- 6	TRL 7 - 9
2017/901 Managing Climate Variability – Phase 5 Forewarned is forearmed: to equip farmers and agricultural value chains to proactively manage the impacts of extreme climate events	Seasonal forecast tools to predict unseasonable and extreme weather events for sugarcane growers and other agricultural industries, led by Meat and Livestock Australia and the Bureau of Meteorology[5].				◆
2018/010 Moth Borers – how are we going to manage them when they arrive?	Validation data sets to support the emergency registration of novel insecticides to manage a moth borer incursion for industry, led by SRA[2].			◆	
2019/905 Boosting Diagnostic Capacity for Plant Production Industries	Cross-industry diagnostics for early detection and rapid response to threats that impact sugarcane and other agricultural industries, led by Grains Research and Development Corporation and various partners[6].		◆		
2020/002 Developing an integrated device for on-farm detection of sugarcane diseases	On-farm diagnostic tool 'SugarPATH' to detect and monitor leaf scald and ratoon stunting disease for growers, led by Griffith University[7].		◆		
2020/004 Beyond Imidacloprid - Chemical and Biorational Alternatives for Managing Canegrubs	Validation data sets to support the emergency registration of novel insecticides to manage canegrubs for industry, led by SRA[3].			◆	
2020/007 Environmental DNA Technologies and Predictive Modelling for Rapid Detection and Identification of Sugarcane Priority Pests	eDNA technology and sampling methods to increase detection and surveillance accuracy of exotic sugarcane pests for industry, led by EnviroDNA[3].		◆		
2020/008 Transformational crop protection – Innovative RNAi biopesticides for management of sugarcane root feeding pests	RNAi biopesticide to manage sugarcane root feeding pests for industry, led by The University of Queensland (UQ)[3]		◆		
2021/002 Pre-commercial development, testing and validation of RSD LAMP assay for sugar mill roll-out	LAMP assay to detect Ratoon Stunting Disease in sugarcane entering the mill for milling companies, led by UQ[3]			◆	
2022/002 Updating the Sugarcane Industry Biosecurity Plan	Updated Biosecurity Plan and Farm Biosecurity Manual for industry, led by Plant Health Australia			◆	
2022/901 Agri-Climate Outlooks	Seasonal outlook products and services for growers and other agricultural producers, led by the Bureau of Meteorology[8]			◆	
SRA Variety Development Program	Breeding activities including development of genetic solutions for the endemic diseases smut, Pachymetra, red rot, leaf scald, Fiji leaf gall, mosaic, yellow spot, orange rust, and brown rust supported by recurrent resistance screening of breeding germplasm, led by SRA				◆
District productivity plan activities	District activities including, but not limited to, regional workshops on RSD and monitoring of yellow canopy syndrome with expanded sampling methods, led by SRA	NA	NA	NA	NA
Disease, pest and pathogen screening services	Operate disease, pest and pathogen screening services for Pachymetra, nematodes and Ratoon Stunting Disease, led by SRA				◆

*Technology Readiness Levels. See page 71 for more information.

5 This cross-sectoral project was supported by funding from the Australian Government Department of Agriculture, Fisheries and Forestry as part of its Rural R&D for Profit program in partnership with rural Research and Development Corporations, commercial companies, state departments and universities, including the Queensland Department of Agriculture and Fisheries and Sugar Research Australia.

6 This cross-sectoral project was supported by funding from the Australian Government Department of Agriculture, Fisheries and Forestry as part of its Rural R&D for Profit program and the Cotton Research and Development Corporation, Forest and Wood Products Australia, Grans Research and Development Corporation, Hort Innovation, Department of Agriculture and Fisheries, South Australian Research and Development Institute, Sugar Research Australia, Victoria Department of Economic Development, Jobs, Transport and Resources, and Wine Australia.

7 This project is funded by the Australian Research Council and Sugar Research Australia.

8 Agri-Climate Outlooks is a collaboration across AgriFutures Australia, Australian Eggs, Australian Wool Innovation, Cotton Research and Development Corporation, Dairy Australia, Fisheries Research and Development Corporation, Grains Research and Development Corporation, Hort Innovation, Meat & Livestock Australia, and Sugar Research Australia, via Agricultural Innovation Australia, delivered by the Bureau of Meteorology.

Mission 2: Success measures

MEASURE	DETAILS
Improved resistance ratings of newly released varieties	Selection for disease resistance is a high breeding priority. The development and adoption of smut resistant varieties has seen the weighted average rating of the commercial crop decrease from 6.4 (susceptible) in 2006, when the disease first arrived in Queensland, to 3.4 (resistant) in 2022 which provides risk mitigation on a whole of industry scale. Within the breeding pipeline the frequency of Pachymetra resistance in experimental clones has increased from 44% in 2006 to 73% in 2022 providing a much higher probability of releasing varieties with effective resistance to multiple diseases.
Estimated avoided costs to production of potential, new and emerging pests, diseases and weeds	In 2022/23, investment by SRA and the Queensland Department of Agriculture and Fisheries in eDNA technology and sampling methods to increase detection accuracy of exotic sugarcane diseases such as Ramu stunt will contribute to avoided yield losses and costs in the event of an incursion. Based on estimates from Papua New Guinea, Ramu stunt can cause yield losses of 60 per cent.
Estimated avoided production loss from advanced crop protection and management technologies	In 2022/23, a benefit-cost analysis on SRA's Pathology Laboratory, a service that provides growers with a rapid assessment of the potential presence of Ratoon Stunting Disease (RSD) in plant material, estimated the service delivers a productivity gain of 5.3 per cent in avoided production losses from the disease. This equates to $15 million and $10 million to growers and milling companies, respectively, in annual economic benefits. For the total evaluation period of 2013/14 to 2022/23, the service delivered an estimated $328 million in economic value (58 and 42 per cent growers and millers).
Farmer understanding of climate-related threats and opportunities (survey)	In 2016/17, 22 per cent of growers reported climate-related threats such as drought, rainfall, and weather extremes as one of three perceived constraints to improving their farm productivity. In 2021/22, this increased to 33 per cent of growers, suggesting more growers are aware of the threats to productivity from climate issues.

MISSION 3: DIVERSIFIED AND ADAPTABLE

Aim: Capitalise on changing consumer preferences, and the growing bio and green economies to develop diversification opportunities

Objective: Deliver research, development and analysis to support the industry by:

- Increasing revenue through leveraging existing resources, brand reputation and supply chain
- Remaining profitable during sugar price fluctuations
- Finding opportunities to monetise biomass potential.

Madeline Smith Queensland University of Technology.

CASE STUDY

SKILLING FOR AND DIVERSIFYING THE FUTURE OF THE SUGARCANE INDUSTRY

Madeline Smith is a biological scientist, who completed her master's degree at Queensland University of Technology in 2022, supported by a research grant from SRA.

The key motivation for Madeline's two-year project, titled *Engineering Pseudomonas Putida for Valorisation of Sugarcane By-products*, was to create a product, with a higher commercial value, from waste products produced in the sugarcane industry.

The sugar industry, both in Australia and globally, is the source of one of the most prolific natural biomass resources on the planet, with sugarcane by-products such as bagasse and molasses a wealth of carbohydrate-rich biomass.

In their simplest forms these resources are a goldmine of fermentable sugars that have the potential to be turned into second-generation biofuels, biomaterials, biochemicals and other high value bioproducts.

In response to global demand for these products, Madeline's project explored the well-characterised industrial strain of the bacteria, *Pseudomonas putida* (*P. putida*) and how it might be successfully engineered to break down both cellulose and sucrose.

P. putida is a bacterium with high tolerance to the toxic aspects of lignin and has the potential to be engineered to produce valuable chemicals.

Madeline has been able to demonstrate that the bacteria will grow on sucrose and could be used to produce high value chemicals from molasses.

However, given there are currently no universal processes for scaling up this study, there is more work to be done before the outcomes of Madeline's work could be commercially ready.

Madeline's QUT master's degree was completed under the supervision of Prof. Robert Speight and Dr James Behrendorff.

Mission 3 Research portfolio

PROJECT	SOLUTION DESCRIPTION	TRL* 1 - 2	TRL 3 - 4	TRL 5- 6	TRL 7 - 9
2020/013 Oil Canes Part 1: Technical readiness and regulatory assessment	Feasibility of the production of triglycerides in sugarcane[9].	◆			
2022/018 Industry engagement capability building - new products and industry development	Building and co-ordinating a network of existing and new industry value chain partners to uncover opportunities for milling companies and growers, led by QUT.	NA	NA	NA	NA

*Technology Readiness Levels. See page 71 for more information.

[9]This project was funded by the Department of Agriculture and Fisheries.

Mission 3: Success measures

MEASURE	DETAILS
Percentage of farms and mills generating revenue from alternative products	Progress on this measure will be reported in future annual reports.
Industry contribution to gross domestic product	The total sugar supply chain is estimated to contribute $4 billion to Australia's gross domestic product. In 2022/23, forecasts indicate sugar production values are expected to rise by $300 million in 2023/24 reflecting strong global prices.
Satisfaction with R&D support for the industry's diversification and trade and market access opportunities	In 2022/23, growers and millers reported moderate satisfaction with SRA's investment to support diversification and trade and market access opportunities. On a scale of 0 to 10 where 0 represents extremely dissatisfied and 10 represents extremely satisfied, growers and millers reported 6.6 and 6.1 for investment in R&D for diversification, and 7.1 and 6.6 for investment in R&D for trade and market access, respectively.

MISSION 4: WEALTH GENERATING THROUGH LAND STEWARDSHIP

Aim: Position the Australian sugarcane industry as leaders in profitability, environmental sustainability and resource-use efficiency

Objective: Recognise that the future success of the industry depends on the sustainable use of inputs including land, water, carbon and energy. Aims to ensure that the Australian sugarcane industry's practices sustain the natural environment and are profitable for growers and millers

Nancy Rincon, SRA Agronomist.

CASE STUDY

MOBILISING THE MURRAY

In early 2022, Sugar Research Australia (SRA) partnered with Terrain Natural Resource Management (NRM), in the Mobilising the Murray Project, funded through the Australian Government's Reef Trust. SRA Environmental Sustainability Scientist, Dr Simon Clarke, led the Murray Project.

The project was a hands-on initiative to drive productivity and efficiency gains for cane growers in the Murray Catchment in northern Queensland, while also delivering water quality outcomes.

The Murray project was unique in its ability to ask the farmer what their issues and constraints were, and to then respond with expert advice backed up by trials and support for critical infrastructure, equipment or services.

The project delivered 20 demonstration sites with encouraging results for both increased industry capability and water quality outcomes.

Most recently, a trial managed through the project was estimating nitrogen contributed by a legume cover crop and adjusting plant cane nitrogen fertiliser rates as a consequence. With project reports available, growers now have a better understanding of how much nitrogen is available in the soil following a legume crop, giving them confidence not to top-dress following a legume crop.

Growers were also supported with incentives to upgrade farm equipment, fencing and nutrient management plans. Financial incentives were provided to improve both productivity and water quality, including the upgrade or construction of farm machinery, fertiliser rate controllers, legume planters, mill mud/ash spreaders and high clearance spray rigs.

The project also saw growers working together with small groups of growers combining project incentives with their own money to purchase or upgrade farm machinery, evidence that the Murray Project is a great catalyst for practice change.

The Mobilising the Murray Project is funded by the Australian Government's Reef Trust and delivered by Terrain NRM in partnership with Sugar Research Australia.

This case study was originally published on Sugar Research Australia's website. Read the full version:
www.sugarresearch.com.au/research/mobilising-the-murray

CASE STUDY

CANE TO CREEK MACKAY WHITSUNDAY

The Cane to Creek Mackay Whitsunday project works with growers in the Central region, Pioneer and Plane Creek Basins to improve understanding of the science behind water quality targets and to implement change on farms.

The aim of the project was to accelerate the adoption of improved nutrient and pesticide management strategies, contributing to the achievement of the stated dissolved inorganic nitrogen (DIN) and pesticide load reduction targets.

SRA Project Officers working on the project assessed farm practices to improve productivity and water quality.

Six flumes, flow meters and automatic samplers were installed in each trial paddock to monitor the runoff produced in six 4-row strips. After every run-off event, runoff water samples were collected to analyse nutrient, herbicide and imidacloprid concentrations. These samples were filtered, refrigerated or frozen before being sent to SRA's Indooroopilly laboratory for analysis.

Flow meters recorded the run-off volumes transiting through the flumes during the runoff event and were used to calculate nutrient, pesticide and herbicide loads leaving the paddock. Productivity data was also collected from all trials at harvest and used to compare practices. Samplers on both trial sites performed as programmed and water samples were successfully collected from each of the trial strips.

Trial 1 – Banded mill mud

Building on results for the 2021/2022 growing season trial, the effect of mill mud on chemicals in the field is being more closely examined.

Banded mill mud strips were found to produce higher nutrient and herbicide losses than where no soil conditioner has been applied. In the 2021/2022 trials, residual herbicides were applied after the banded mill mud was put in place.

Data from small scale trials previously conducted by SRA indicated that herbicide loss via run-off was minimised where the herbicides were applied before (under) the banded mill mud. This finding was considered at a paddock scale in the mill mud trial in the 2022/2023 growing season.

Trial 2 – Enhanced Efficiency Fertiliser (EEF)

The second trial site was set up to gather more data about the impact of Enhanced Efficiency Fertiliser (EEF) on productivity and water quality. Strips were set up with urea applied at the SIX EASY STEPS® (6ES) recommended rate, EEF at the 6ES recommended rate, and EEF at 80 per cent of the 6ES recommended urea rate (in accordance with EEF60 project findings). The difference in run-off between liquid imidacloprid applied with a stool splitter to that applied with a side dresser was also measured.

Trial 3 – Imidacloprid at hill-up

The final trial site for the 2022/2023 growing season compared liquid and granular imidacloprid when applied at hill-up on plant cane as per the label. There was limited run-off data available for testing.Cane to Creek Mackay Whitsunday is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation with support from Sugar Research Australia, Mackay Area Productivity Services and Plane Creek Productivity Services. The EEF60 project was a collaborative partnership between sugarcane growers, CANEGROWERS, Sugar Research Australia, regional productivity services and agricultural economists from the Department of Agriculture and Fisheries. The Cane to Creek Mackay Whitsunday project is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation with support from Sugar Research Australia, Mackay Area Productivity Services and Plane Creek Productivity Services.

This case study was originally published on Sugar Research Australia's website. Read the full version:
www.sugarresearch.com.au/research/mackay-whitsunday-cane-to-creek/

Mission 4 Research Portfolio

PROJECT	SOLUTION DESCRIPTION	TRL* 1 - 2	TRL 3 - 4	TRL 5- 6	TRL 7 - 9
2020/001 Environmental Risk Assessment & Life Cycle Assessment of the Raw Sugar Manufacturing	Life cycle assessment to benchmark and drive improvements in the industry's environmental and social impact led by Integrity Ag & Environment[10].			◆	
2020/017 A common approach to sector level GHG accounting for Australian agriculture	Standard protocol for greenhouse gas emissions accounting for agricultural industries led by CSIRO[11].				◆
2020/802 Mackay Whitsunday Cane to Creek	Training and adoption activities targeting improved nutrient and pesticide management solutions for growers and enhanced water quality in the central district led by SRA[12].	NA	NA	NA	NA
2020/804 Reducing herbicide usage on sugarcane farms in reef catchment areas with precise robotic weed control	AutoWeed smart spot spraying system to reduce knockdown herbicide usage on sugarcane farms led by James Cook University (SRA is a delivery provider).			◆	
2020/805 Burdekin Irrigation Project: Increasing Industry Productivity and Profitability Through Transformational, Whole of Systems Sugarcane Approaches that Deliver Water Quality Benefits	Training and adoption activities targeting improved irrigation efficiency and water quality solutions for growers in the Burdekin district led by SRA[13].	NA	NA	NA	NA
2021/007 Investigating Potential for Sugar Industry Participation in Green Markets	Industry feasibility assessment of green market opportunities for growers led by Central Queensland University[3].	◆			
2021/008 Australian Sugarcane Sustainability Framework	Sugarcane Industry Sustainability Framework to drive improvements in the industry's environmental impact led by Roth Rural[3].			◆	

*Technology Readiness Levels. See page 71 for more information.

[10]This project was funded by the Department of Agriculture and Fisheries and Sugar Research Australia.

[11]This cross-sectoral project was funded through contributions from Agricultural Innovation Australia, the Commonwealth Scientific and Industrial Research Organisation, AgriFutures Australia, Australian Pork, Cotton Research and Development Council, Dairy Australia, Grains Research and Development Council, Hort Innovation, Meat & Livestock Australia, Sugar Research Australia, Wine Australia, and the Western Australian Department of Primary Industries and Rural Development.

[12]The *Cane to Creek Mackay Whitsunday* project is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation with support from Sugar Research Australia, Mackay Area Productivity Services and Plane Creek Productivity Services.

[13]The *Burdekin Irrigation Project* is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation with support from Sugar Research Australia, Farmacist, AgriTech Solutions, Burdekin Productivity Services, Burdekin Bowen Irrigated Floodplain Management Advisory Committee, NQ Dry Tropics, James Cook University and the Department of Agriculture and Fisheries.

PROJECT	SOLUTION DESCRIPTION	TRL* 1 - 2	TRL 3 - 4	TRL 5- 6	TRL 7 - 9
2021/804 Mobilising the Murray Project	Training and adoption activities targeting whole-of-farm solutions for productivity constraints experienced by growers in North Queensland, led by SRA[14].	NA	NA	NA	NA
2021/805 Soil specific management for sugarcane production in the Wet Tropics	Training and adoption activities targeting improved knowledge and understanding of soils across the Wet Tropics region to support profitable and sustainable production, led by SRA[15].	NA	NA	NA	NA
2021/806 Online Sugarcane Nutrient Management Training	Online sugarcane nutrient management training delivered to growers and other industry stakeholders, led by SRA[16].	NA	NA	NA	NA
2022/603 EU-PEF Australian Participation in the European Union Product Environmental Footprint Technical Advisory Board	Recommendations to the European Union's Product Environmental Footprinting methodology to appropriately quantify the environmental credentials of sugarcane and other agricultural industries to maintain current trade and market access, led by Australian Wool Innovation Limited, and Integrity Ag & Environment [17].	NA	NA	NA	NA
2022/801 Burdekin Smart Project and Lower Burdekin Cane Incentives (2022/802)	Training and adoption activities targeting improved irrigation efficiency and water quality solutions for growers in the Burdekin district, led by SRA[18].	NA	NA	NA	NA
2022/803 Cassowary Coast Reef Smart Farming	Training and adoption activities targeting improved nutrient use efficiency and reduced amounts of Dissolved Inorganic Nitrogen flowing into waters in North Queensland led by CANEGROWERS (SRA is a delivery provider)[19].	NA	NA	NA	NA
District productivity plan activities	District activities including, but not limited to, SIX EASY STEPS® validation trial in North Queensland and adoption of controlled traffic systems in New South Wales, led by SRA	NA	NA	NA	NA

*Technology Readiness Levels. See page 71 for more information.

[14]The *Mobilising the Murray Project* is funded by the Australian Government's Reef Trust and delivered by Terrain NRM in partnership with Sugar Research Australia..

[15]This project is supported by Sugar Research Australia and the University of Southern Queensland, through funding from the Australian Government's National Landcare Program.

[16]The Online Sugarcane Nutrient Management Training project is jointly funded through the Queensland Government's Reef Water Quality Program and Sugar Research Australia, the key contributors responsible for the development and ongoing improvement of the SIX EASY STEPS® nutrient management program are gratefully acknowledged: Sugar Research Australia, University of Southern Queensland, Tanglewood Services and Morrisey Ag.

[17]This cross-sectoral project includes investment by AgriFutures Australia, Australian Wool Innovation, Cotton Research and Development Corporation, Grains Research and Development Corporation, Meat and Livestock Australia, and SRA.

[18]These projects are funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, and Castlemaine Perkins.

[19]The *Cassowary Coast Reef Smart Farming* project is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.

Mission 4: Success measures

MEASURE	DETAILS
Positive progress in environmental credentials measured in industry benchmarking	The 2020 Reef Report Card (released during 2021/22) reported a moderate reduction progress towards the Dissolved Inorganic Nitrogen (DIN) target across Great Barrier Reef catchments in 2019/20 with a moderate annual reduction of 2.2 per cent. The Johnstone catchment (Wet Tropics region) had the greatest annual reduction (6.4 per cent). Reductions were identified as being mostly due to improved nitrogen fertiliser management and mill mud application in the sugarcane industry. Further progress for this measure will be reported in future annual reports when new data are available. In 2022/23, growers reported five per cent of their farm area was devoted to environmental purposes/natural ecosystems that is not used for grazing, a decrease from seven per cent for the previous year.
Positive external perceptions of sugar industry activities and efforts (government and public views)	In 2021/22, survey results suggest 41 per cent of community members believe the sugar industry responsibly manages land and natural resources in a sustainable manner, and 64 per cent believe sugarcane production is a sustainable industry. Further progress for this measure will be reported in future annual reports when new data are available.
Industry participation in green markets	In 2022/23, survey results suggest 23 per cent of growers have participated in or plan to participate in green market opportunities such as carbon programs, renewable energy, and environmental stewardship schemes.
Industry uptake of, and satisfaction with, compliance and decision tools.	In 2022/23, examples of industry uptake of newly released decision support tools by SRA include 165 users of the Online Sugarcane Nutrient Management training program, and 48 growers and harvesting contractors, harvesting land representing approximately four per cent of the total caneland area, are using the Harvest Mate App. Survey estimates suggest 11 per cent of growers plan to use the App in the 2023 season.

MISSION 5: SKILLED FOR THE FUTURE

Aim: Position the industry to stay ahead of climate, environmental and biosecurity threats

Objective: Minimise and control risk to production from pests, diseases, weeds and climate / environmental threats

Australian native stingless bee (Tetragonula carbonaria) on a strawberry flower. Credit Tobias Smith, UQ.

CASE STUDY

FIRST STEPS TO SMART SUGAR BY STINGLESS BEES

Dr Natasha Hungerford at the Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland (UQ), set out to characterise the sugar content of Queensland stingless bee honey, finding more than she bargained for.

Supported by a Sugar Industry Research Award from SRA, Natasha and her team took the first steps to produce a 'smart' sugar from the sucrose found in sugarcane with the help of *Tetragonula carbonaria*, a stingless bee commonly known as the sugarbag bee.

But the researchers were surprised to find something other than common sucrose – trehalulose.

Trehalulose offers health benefits, with previous studies showing it has a low glycaemic Index (GI), and is acariogenic, meaning it doesn't cause tooth decay. It also has antioxidant properties.

Its chemical synthesis in the factory is complicated, however, the stingless bee's natural enzyme could make this process a more viable option. Stingless bees have evolved a unique capacity to efficiently change the sucrose found in nectar to trehalulose.

Natasha and team are working to understand this capability, ultimately for commercial benefit - to use sucrose from sugarcane juice, as an inexpensive feedstock to produce trehalulose.

The first step is to understand and harness the bee's ability to make this conversion by identifying and isolating the productive enzyme. That enzyme can then be produced to convert sucrose to trehalulose.

Natasha, a chemist, called on the expertise of Dr Loan Nguyen, a Research Fellow at QAAFI and an expert in long read DNA/RNA sequencing, to mentor PhD student Jiali Zhang in the project.

Jiali conducted experiments for his honours project to prove that when *Tetragonula carbonaria* were fed sucrose they would convert it to trehalulose. Using state-of-the-art Nanopore technology as well as cutting edge bioinformatics techniques, the team will assess RNA activity in the tissue glands of the bee with the aim of identifying the gene that is involved in the process that produces trehalulose.

The expression of the isolated gene would yield an enzyme to produce pure trehalulose directly from sucrose - a more efficient way to produce a smart sugar.

Potentially, Natasha and team will work on optimising the process for converting sucrose to trehalulose at scale.

CASE STUDY

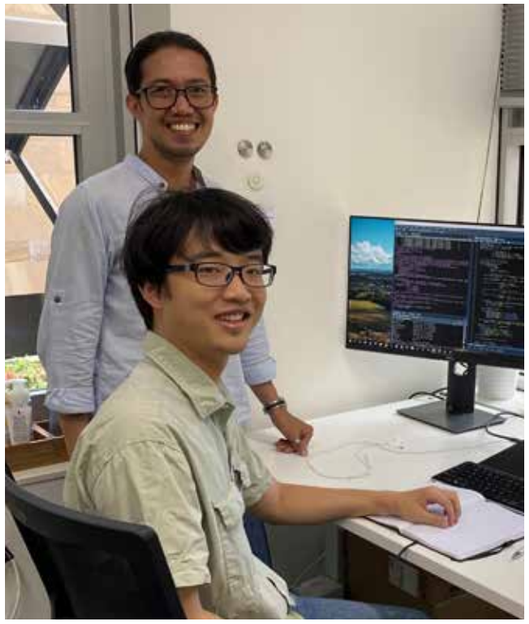
GENOMIC PREDICTION OF RATOON YIELD ROBUSTNESS

Dr Eric Dinglasan, crop genetics researcher for the Queensland Alliance for Agriculture and Food Innovation (QAAFI), at The University of Queensland, and colleagues received an SRA Sugar Industry Research Award to expand the work of Professor Ben Hayes and his current SRA-funded project - 2017/002: Implementing and validating genomic selection in SRA breeding programs to accelerate improvements in yield, commercial cane sugar and other key traits.

An Australian first assessment of the ratoon performance and robustness of performance within the SRA breeding program will enable better parent and clonal management strategies in selecting the best clones at three main stages of selection (i.e. Progeny Assessment Trial, PAT; Clonal Assessment Trial, CAT; and Final Assessment Trial, FAT).

Insights will improve parent selection within different regions and improve understanding of genotype x environment interactions, providing more targeted and precise crossing designs and saving both time and resources at population development. It will also bring about a faster turn-over of potential new varieties that can be released.

With extensive data provided by SRA researchers, Eric and colleagues will utilise machine learning in this project to develop genomic prediction models that can account for both additive and non-additive genetic effects.



Eric Dinglasan (back) with PhD student Chensong Chen (front).

If successfully applied to predict and evaluate the ratoon performance on the Final Assessment Trial (FAT) of a chosen clone, the breeding pipeline will be greatly reduced, fast tracking product development strategies and operational efficiency of the SRA breeding program.

This case study was originally published in Cane Matters Autumn 2023. *Read the full version here:* www.sugarresearch.com.au/resources-and-media/publications

Mission 5 Research Portfolio

PROJECT	SOLUTION DESCRIPTION	TRL* 1 - 2	TRL 3 - 4	TRL 5- 6	TRL 7 - 9
2018/015 Sugar Milling R&D Capability Building Program	Milling research capacity-building and succession-planning program for early career researchers, led by QUT[20].	NA	NA	NA	NA
2019/102 Genetic solutions for determining fibre quality traits in sugarcane.	PhD scholarship: Molecular markers and method to measure fibre quality to increase breeding efficiency for SRA's Plant Breeding Program, led by UQ.		◆		
2020/101 Engineering bacterial enzyme secretion for cellulose utilisation	Master's scholarship: Production of biochemicals from sugarcane waste using microbial technology, led by QUT.		◆		
2021/101 Optimising mill mud and ash applications for soil improvement and carbon sequestration	PhD scholarship: Method to apply mill mud and ash to maximise yield and soil health, and measure soil carbon sequestration, led by James Cook University.	◆			
2021/102 Systems biology for sustainable agriculture: evaluation of plant growth-promoting bacteria to produce gh-performing biofertilisers	PhD scholarship: Biofertiliser with optimal soil nutrient utilisation to increase yields led by UQ.	◆			
2021/401 Risk assessment for the newly discovered parasitic nematode *Pratylenchus parazeae* in the Australian sugarcane industry	Research award: Assessment of the pathogenicity of a newly discovered parasitic nematode and resistance within germplasm, led by SRA.	◆			
2021/402 Towards more sustainable pest control strategies through a metagenomic survey of viral entomopathogens in canegrub populations	Research award: Integrated pest management using novel insect-specific viruses to biologically manage canegrubs, led by UQ.	◆			
2022/101 A novel biosensor device for on-farm sugarcane disease diagnosis	PhD scholarship: A biosensor device to diagnose sugarcane disease on farm, led by Griffith University.		◆		
2022/401 Harnessing the synbiotic potential of Australia's stingless bees, the first step	Research award: Identifying the gene/enzyme in stingless bees that is responsible for efficiently isomerising the sucrose found in nectar to trehalulose, led by UQ	◆			
2022/402 Genomic prediction of ratoon yield robustness	Research award: Genomics selection software to assess the robustness of clone yield across ratoon crops and enable selection of clones that have more consistent yield across ratoon crops led by UQ.		◆		
2022/601 Australian Sugar Industry Scholarships & Bursaries	Scholarships and bursaries for undergraduate engineering students to build knowledge and experience of milling and to support employment pathways led by QUT.	NA	NA	NA	NA
District productivity plan activities	District activities including, but not limited to, establishing grower groups and building participation in the industry led by SRA.	NA	NA	NA	NA

*Technology Readiness Levels. See page 71 for more information.

[20]This program is funded by Queensland University of Technology, Sugar Research Institute and Sugar Research Australia.

SRA uses the *Crop Research Technology Readiness Levels (TRLs) adapted from the National Aeronautics and Space Administration (NASA) TRL system by the United States Department of Agriculture[21]. Like the NASA TRLs, the Crop Research TRLs have a scale of nine levels. TRL 1 is the lowest, indicating the earliest stage of development for a new technology, and TRL 9 the highest, indicating the technology is fully implemented and actively impacting the agricultural economy. The nine-level scale progresses through four stages towards maturity: Preliminary Technology Solution Evaluation, Experimental Testing, Pre-Commercial Assessment, and Commercial Deployment.

Stage	TRL	Description
Preliminary Technology Solution Evaluation	1	Industry challenge/opportunity identified
	2	Innovative solution or approach formulated
Experimental testing	3	Proof of concept experiments to demonstrate potential added value by the innovation
	4	Field trials or technology performance experiments to validate the innovation
Pre-Commercial Assessment	5	Field-scale production trials or on-site technology assessments to validate commercial use
	6	Full-scale production initiated of innovation
Commercial Deployment	7	Innovation delivered to industry for commercial-scale production
	8	Commercial use established including ongoing monitoring and research to improve the innovation
	9	Sustained production capacity achieved including full array of services available to support system-level production and distribution

Source: Crop Research Technology Readiness Levels (United States Department of Agriculture, 2018, Crop Research Technology Readiness Level (TRL), National Institute of Food and Agriculture)

[21]Crop Research Technology Readiness Level 2018 (usda.gov)

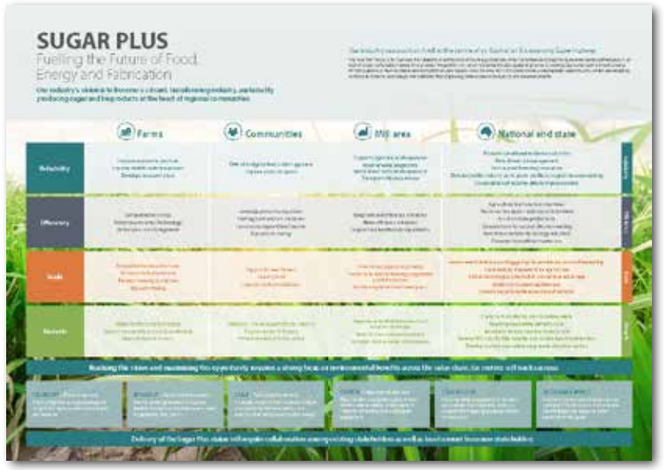
Mission 5: Success measures

MEASURE	DETAILS
The number and diversity of industry and research partners involved in establishing SRA's R&D goals and strategies	In 2022/23, SRA staff engaged 1019 stakeholders from a range of groups such as growers (58 per cent), industry representative organisations (ten per cent), commercial advisory and agricultural technology companies (eight per cent), productivity services (seven per cent), and milling companies (seven per cent). SRA's industry engagement activities sought to achieve a range of strategic objectives including, but not limited to, identifying R&D goals, productivity constraints, and training and adoption initiatives.
Number of capability building programs, and participation rates for capability programs, including diversity of participation	In 2022/23, SRA invested in capability building via the following initiatives: ■ Two early career researchers supported through the Sugar Milling R&D Capability Building Program ■ One scholarship awarded to an undergraduate engineering student as part of the Australia Sugar Industry Scholarships & Bursaries Program ■ Two online training programs covering milling operations and nutrient management with the latter recording 165 participants by June 2023 ■ New project to build a network of existing and new industry value chain partners to uncover diversification opportunities.
Number of undergraduate places supported in industry critical areas such as agronomy	In 2022/23, one undergraduate engineering position was supported, bringing the total to nine places supported since 2021/22.
Number of PhD submissions relating to the sugar industry	In 2022/23, one master's thesis was submitted and three PhDs progressed and will be submitted in 2023/24. This brings the total number of PhD and master's theses submitted since 2021/22 to four.

Sources: SRA; SRA's 2023 Grower and Miller Survey Reports by Intuitive Solutions; Cost Benefit Analysis of Selected Research Programs by ACIL Allen; The Economic Contribution of the Sugarcane Industry to Queensland its Regional Communities completed by Queensland Economics Advocacy Solutions; Agricultural Overview by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) completed; SRA's Grower Survey 2016 completed by Down To Earth Research; and the Sugarcane Farm Business Survey completed by ABARES; Reef Report Card 2020 completed by the Australian and Queensland Government's Reef 2050 Water Quality Improvement Plan; and Community Trust in Rural Industries Sugar Fact Sheet 2022 by Seftons.

SUGAR PLUS INDUSTRY ROADMAP

The Australian sugarcane industry has released its first whole-of-industry vision and roadmap.



***Sugar Plus – Fuelling the Future of Food, Energy and Fabrication*, outlines a clear path for the Australian industry to secure and grow its value for future generations.**

The roadmap sets out a series of actions in the near, medium, and longer term, to strengthen and build the industry while charting a path to a bigger, bolder future.

A shared vision

Securing a prosperous and sustainable future for our industry requires more than a plan. It needs a compelling and shared industry vision. It also needs strong, united voices willing to support and promote the opportunities available to an industry, which has underpinned regional prosperity for more than a century.

Our vision is to become a vibrant, transforming industry, sustainably producing sugar and bioproducts at the heart of regional communities. This will enable exploration of the potential to position the industry at the heart of Australia's future bioeconomy, enabled by supportive government policy settings and new investment.

Find out more about Sugar Plus Industry Roadmap at: www.sugarresearch.com.au/resources-and-media/sugarcane-industry-roadmap

A future of food, energy and fabrication

The sugarcane plant is one of the most resilient and adaptable plants on Earth – it is the perfect ingredient to help fuel the future of Food, Energy and Fabrication.

Food is where it all starts – raw sugar will continue to play an important role in feeding the world over the long term, and sugar is an important feedstock for the new generation of animal-free foods.

Energy that builds on current co-generated power and ethanol production to provide the next frontier of sustainable mobility and power – the sugarcane plant is one of the best natural sources for transforming into renewable energy and biofuels for heavy transport and aviation.

Fabrication for the future – making products that enable a more sustainable way of life, including much-needed replacements for the many plastic items that are produced and used every day.

Ensuring sustainability

Our industry knows that these opportunities need to be pursued in a sustainable manner. We are committed to growth pathways that look after our people, the products we produce, and the planet.

To realise the Sugar Plus, the roadmap sets out measures to strengthen and build the industry, while charting a path for the businesses and communities at the heart of the industry's future in Australia. While some parts of the roadmap are focused on better business-as-usual and adding value to current operations across the value chain, other parts are about the steps we need to take to unlock the vast opportunities presented by the bioeconomy.

Realising these opportunities will take significant effort and collaborative action across the industry, supported by our partners in the state and federal governments.

Engaging across the supply chain

Developing the roadmap involved extensive engagement across the sugarcane industry supply chain to co-develop a blueprint for the future.

The industry will now form a series of working groups to drive realisation of the vision and the opportunities identified in the roadmap.

Industry partners

- Cooperative Research Centre for Developing Northern Australia (CRCNA)
- Sugar Research Australia (SRA) – project sponsor
- CANEGROWERS
- Australian Sugar Milling Council (ASMC)
- AgForce
- Australian Cane Farmers Association (ACFA)
- Queensland Government's Department of Agriculture and Fisheries (DAF).

CRCNA

sra Sugar Research Australia

Australian Sugar Milling Council

CANEGROWERS

Australian Cane Farmers

AGFORCE

Australian Government
Department of Agriculture, Fisheries and Forestry

APPENDICES

Directors Report

Financial Statements

Reporting to funding and collaboration partners

Compliance checklist

DIRECTOR'S REPORT

For the year ending 30 June 2023

The Directors of Sugar Research Australia Limited ABN 16 163 670 068 ("Company" or "SRA") submit their report for the financial year ended 30 June 2023 ("reporting period") as follows:

Company limited by guarantee

The Company was incorporated on 8 May 2013 and is a public company limited by guarantee. The Company has Group G members (sugarcane growers) and Group M (sugar mill) members (together the "members"). The Constitution states that, if the Company is wound up, the liability of each member is limited as follows:

a. each member at the time the winding up starts; and

b. each person who, at any time in the 12 months before the winding up started, was a member, undertakes to contribute to the assets of the Company up to an amount not exceeding $2 for payment of the debts and liabilities of the Company, including the costs of winding up.

As at 30 June 2023, there were nine (9) Group M members and 2,645 Group G members. The total amount the members of the Company are liable to contribute if the Company is wound up for 2022/23 is $5,308.

On any winding up of the Company, any surplus property must not be paid to members but must be paid or transferred to another corporation, fund, authority or institution with:

a. objects similar to the Company's objects; and

b. a constitution which prohibits the distribution of its income and property among its members.

Objectives

a. The primary long-term objective of SRA over the reporting period has been to enable Australia's sugarcane industry to be profitable, sustainable and resilient.

In support of this objective, SRA has been focused over the short to medium-term on the following goals:

- Increasing profitability across the sugarcane value chain through innovation-led productivity gains, step-change, and value-adding;
- Improving sustainability through evidence-based research and sustainable production, biosecurity and environmental management;
- Enhancing capability through strengthened research and industry partnerships, capability development programs and collaborative knowledge transfer and adoption mechanisms; and
- Strengthening organisational excellence through enhanced research, development and adoption investment management, best practice organisational governance and a positive performance-focused organisational culture.

Strategy for achieving objectives

The complete strategy for delivery on SRA's objectives, goals over the reporting period is detailed in SRA's Strategic Plan 2021-2026 which is available on SRA's website at www.sugarresearch.com.au.

The Strategic Plan sets out a revised vision of being:

A trusted partner, shaping the future prosperity of the Australian sugarcane industry and regional communities through innovation and ingenuity. And delivered under five strategic pillars:

STRATEGIC PILLAR 1 – STRONG FOUNDATIONS

Evolve SRA to keep pace with the changing industry landscape by developing a capable, engaged, and safe workforce, and a lean, agile and entrepreneurial organisation with an agile and efficient cost-base.

STRATEGIC PILLAR 2 – A HIGH-PERFORMING RESEARCH PORTFOLIO

Design a focused, balanced and collaborative portfolio of RD&E investments and initiatives that deliver tangible solutions and options to advance the productivity, sustainability, profitability, and long-term growth prospects for the Australian sugarcane industry.

STRATEGIC PILLAR 3 – TRANSLATION EXPERTISE

Translate research findings into tools, products and services that save industry time and money, and improve environmental performance.

STRATEGIC PILLAR 4 – WORLD-CLASS SUGARCANE VARIETIES

Accelerate innovation in variety development to offer varieties that consistently underpin the success of the industry's current and future product objectives, crop production and protection while lowering development costs and shortening cycle-times.

STRATEGIC PILLAR 5 – COMMERCIAL BENEFITS AND REWARDS

Take our research work and investments to the next level by securing investors and funding and extracting commercial value from our intellectual property, research capability, facilities and strategic partnerships.

The Strategic Plan delivers and establishes the following five Research Missions:

1 PROFITABLE AND PRODUCTIVE

Continuous improvement in farming and milling profitability.

2 RESILIENT AND ENDURING

Position the industry to stay ahead of climate, environmental and biosecurity threats.

3 DIVERSIFIED AND ADAPTABLE

Capitalise on changing consumer preferences, and the growing bio and green economies to develop diversification opportunities.

4 WEALTH GENERATING THROUGH LAND STEWARDSHIP

Position the Australian sugarcane industry as leaders in profitability, environmental sustainability and resource-use efficiency.

5 SKILLED FOR THE FUTURE

Support the development of an adaptable, professional, commercial and entrepreneurial industry and research community

Principal activities during the reporting period

The Company's principal activities during the reporting period consisted of research, development and adoption activities to contribute to the development of the Australian sugarcane industry. As detailed in the Constitution, the Company receives, amongst other funding, funds from the Commonwealth of Australia by way of proceeds from the sugarcane levy payable by sugarcane growers and millers under the Primary Industries (Excise) Levies Act 1999 (Cth).

Through utilisation of the sugarcane levy and funding from other sources, the Company carries out, co-ordinates and invests in research and development activities, to facilitate dissemination, adoption and commercialisation of results of research and development activities in relation to the Australian sugarcane industry.

Financial Result

The financial result for the reporting period is a $2,462 thousand surplus (2021: $144 thousand loss), including:

- $2,338 thousand surplus (2021: $335 thousand loss) from operating activities; and
- $124 thousand (2020: $191 thousand) of interest income.

Performance measurement

SRA's five-year Strategic Plan and Annual Operational Plans set out SRA's strategic and operational agenda, by which delivery against this agenda is measured. The 2021-26 Strategic Plan was developed in collaboration with SRA's industry and government investors and is underpinned by the five Research Missions referred to above.

SRA entered into its new Statutory Funding Agreement 2021-2031 ("SFC") with the Commonwealth Department of Agriculture, Water and the Environment (now the Department of Agriculture, Fisheries and Forestry) (DAFF) on 3 August 2021. As of January 2022, DAFF requires Research Development Corporations (RDCs) to report on performance indicators outlined in the relevant SFC (SFC Performance Principles). These include five interlinked principles: stakeholder engagement; research, development and extension (RD&E) activities; collaboration; governance; and monitoring and evaluation. Each SFC Performance Principle includes outcomes and key performance indicators (KPIs) which are mandatory for RDCs to report against.

SRA has developed a monitoring and evaluation (M&E) plan for the SFC Performance Principles. This includes the indicators and methods SRA will use to report on the SFC Performance Principles referred to above and as outlined in the Commonwealth's Guidelines for Statutory Funding Agreements.

SRA's M&E plan employs an impact pathway logic-based model to guide the assessment of SRA's performance against delivery of its Strategic and Annual Operational Plans. The primary mechanisms within SRA's M&E plan include:

- Project milestone and output monitoring and reporting;
- Operational and strategic reporting to the Board and Audit and Risk Committee;
- Six-monthly exception reporting to the Board on progress against the Strategic Plan;
- Annual reporting on performance to DAFF as required under SRA's SFC entered into with DAFF on 3 August 2021;
- Project and program impact assessments;
- Annual grower and miller surveys on practice change and investor satisfaction;
- Annual performance reports, including traffic light reporting against the KPIs in SRA's Strategic Plan and Annual Operational Plan;
- Independent Performance Reviews; and
- Cross Research and Development Corporations Impact Assessment Program.

The Audit and Risk Committee reviews, on an ongoing basis, a suite of reports that cover SRA's strategic and operational performance. These include: SRA operational reports, such as Finance, Workplace Health and Safety and Risk Management; and reports on the investment project portfolio. Where required, the Audit and Risk Committee provides the SRA Board with recommendations for remedial action to be taken to ensure SRA's strategic and operational performance remains on-track.

SRA also regularly communicates with its investors and other stakeholders on the Company's strategic and operational performance and uses feedback on its performance to continually improve the quality of its research and investment processes, programs and activities.

Board of Directors

The following persons were Directors of the Company during the 2022-2023 financial year:

- Rowena McNally – Independent Non-Executive Chair
- Shaun Coffey – Independent Non-Executive Director (retired effective 9 July 2023) and interim Chief Executive Officer (appointed effective 10 July 2023)
- Mark Day – Independent Non-Executive Director
- Rosemary Richards – Independent Non-Executive Director
- Peter Russo – Independent Non-Executive Director
- Gavin Whiteley – Independent Non-Executive Director
- Rowley Winten – Independent Non-Executive Director
- Sam (Salvatore) Bonanno – Independent Non-Executive Director (retired 29 May 2023)
- Dr Jeremy Burdon – Independent Non-Executive Director (retired 21 November 2022)
- Lindy Hyam – Independent Non-Executive Director (retired 21 November 2022)

Those Directors listed as Independent Non-Executive Directors have been independent throughout the period of their appointment. Details of their qualifications, experience, and responsibilities are set out on pages 15 to 20.

Company Secretary

Michael Shannon was the Company Secretary of the Company from 13 January 2014 to January 2023. Michael is an experienced company secretary and lawyer specialising in corporate and commercial law having worked in private legal practices in Australia and the UK and has performed in-house company secretarial and legal roles at an ASX listed company and at a large Australian retail banking organisation. Michael left the organisation after nine years with SRA.

Jin Poh was appointed to the position of General Counsel and Company Secretary on 27 March 2023. Jin is a seasoned and pragmatic legal executive, lawyer, and company secretary with extensive strategic and operational credentials gained from a variety of professional appointments within complex/cost sensitive and highly regulated sectors domestically and internationally. Jin has extensive executive experience in legal and corporate governance, gained through roles in Australia and UK including Sodexo, Super Retail Group, Association of Corporate Counsel, Autoguru, Autocrew, and the UK Government.

Directors' and Officers' Indemnification and Insurance

Under the Company's Constitution, the Company may indemnify any current or former director, company secretary and officer to the extent permitted by law, against:

- every liability owed by the person in that capacity (except a liability for legal costs); and
- all legal costs incurred by them in defending or resisting (or otherwise in connection with) proceedings,

Whether civil or criminal or of an administrative or investigatory nature, in which the person becomes involved because of that capacity, except, to the extent that the Company is forbidden by law to indemnify the person against the liability or legal costs, or an indemnity by the Company of the person against the liability or legal costs would, if given, be made void by law.

Consistent with the provisions of the Constitution, the Company has entered into deeds of access, indemnity and insurance with all directors, under which the Company indemnifies the director against the full amount of any liabilities, costs and expenses (including legal fees) incurred by them in their respective capacities, subject to certain exclusions, including to the extent that the indemnity by the Company of any such person is prohibited by the Corporations Act or other applicable law.

During the reporting period, the Company paid an insurance premium in respect of an insurance policy for the benefit of directors, company secretary and other officers of the Company and an additional premium in respect of professional indemnity insurance. The directors' and officers' liability insurance policy grants indemnification in respect of certain liabilities for which the Corporations Act 2001 (Cth) allows indemnification. In accordance with normal commercial practice and under the terms of the insurance policies, the nature of the liabilities insured against, and the amount of premiums paid remain confidential.

Meetings of Directors

The number of Directors' meetings and Board committee meetings held during the reporting period and the number of meetings attended by each Director were as follows:

SRA BOARD & COMMITTEE MEETINGS 1 July 2022 TO 30 JUNE 2023				
Directors	Board	Board Committees*		
		Audit and Risk	People, Performance and Remuneration	Research Funding Panel
Rowena McNally (Chair)	6 [6]^	6 [6]	4 [4]	3 [3][6]
Shaun Coffey[1]	4 [4][1]	1 [1][4]	2 [2][5]	5 [5]^^^^
Mark Day	6 [6]	6 [6]	-	-
Rosemary Richards[1]	4 [4][1]	1 [1][4]	2 [2][5]	2 [2][7]
Peter Russo	6 [6]	4 [6]	-	-
Gavin Whiteley[1]	4 [4][1]	4 [4]^^	-	-
Rowley Winten	6 [6]	-	4 [4]^^^	-
Sam Bonanno	5 [5][2]	5 [5]^^	-	-
Dr Jeremy Burdon	2 [2][3]	-	2 [2]	5 [5]^^^^
Lindy Hyam	2 [2][3]	-	2 [2]^^^	-

Where a Director did not attend all meetings of the Board or relevant committee, the number of meetings for which the Director was eligible to attend is shown in brackets.

* *The Company has established a Director Selection Committee which does not comprise any Directors and is comprised of an independent chair and 2 representatives from Group M members and 2 representatives from Group G members. This Committee held 3 meetings during the reporting period.*

1 *Commenced as Director following appointment on 21 November 2022*

2 *Retired as Director on 29 May 2023*

3 *Retired as Director on 21 November 2022*

4 *Appointed as member of the Audit and Risk Committee on 30 May 2023*

5 *Appointed as member of the People, Performance and Remuneration Committee on 14 December 2022*

6 *Appointed as member of the Research Funding Panel on 14 December 2022*

7 *Appointed as observer of the Research Funding Panel on 14 December 2022*

^ *Indicates Chair*

^^ *Gavin Whiteley was appointed Chair of the Audit and Risk Committee on 30 May 2023 following Sam Bonanno's retirement as Director and Chair of the Audit and Risk Committee on 29 May 2023*

^^^ *Rowley Winten was appointed Chair of the People, Performance and Remuneration Committee on 14 December 2022 following Lindy Hyam's resignation as Director and Chair of the People, Performance and Remuneration Committee on 21 November 2022*

^^^^ *Shaun Coffey was the Chair of the Research Funding Panel until 21 November 2022 when he was appointed Director. Shaun became SRA's Director Representative on the Research Funding Panel on 21 November 2022. Dr Jeremy Burdon retired as Director on 21 November 2022 and was appointed the Chair of the Research Funding Panel on the same day.*

Proceedings on behalf of the Company

No person has applied to the Court under section 237 of the Corporations Act for leave to bring proceedings on behalf of the Company, or to intervene in any proceedings to which the Company is a party for the purpose of taking responsibility on behalf of the Company for all or part of those proceedings.

Rounding

The Company is of a kind referred to in ASIC Corporations (Rounding in Financial/Directors' Reports) Instrument 2016/191 and in accordance with that instrument, amounts in the financial report and director's report have been rounded off to the nearest thousand dollars, unless otherwise stated.

Registered office

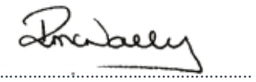
Level 10, Suite A, 300 Queen Street

Brisbane QLD 4000

Auditor's independence

The Auditors Independence Declaration in relation to the audit for the year ended 30 June 2023 as required under section 307C of the Corporations Act 2001 (Cth) has been received by the Company and is included on pages 103 to 106 and forms part of the Directors' report for the reporting period ended 30 June 2023.

This report is made in accordance with a resolution of the Board of Directors and is authorized for and on behalf of the Directors by:



Rowena McNally (Chair)

Gavin Whiteley (Director)

Brisbane

October 2023

Statement of profit or loss and other comprehensive income

For the year ended 30 June 2023

	Notes	2023 $'000	2022 $'000
Revenue	*4*	38,943	33,542
Other revenue	*5*	12,465	311
		51,408	33,853
Employee benefits		18,049	16,805
Operating expenses	*6*	14,717	13,940
Depreciation and amortisation	*7,11,12*	3,072	2,789
Interest Expense - Leases	*7*	85	-
		35,923	33,534
Results from operating activities		15,485	319
Finance Income		1,358	125
Profit(Loss) for the year		16,843	444
Other comprehensive income		-	-
Total other comprehensive income		-	-
Total comprehensive income		16,843	444

The above statement of profit or loss and other comprehensive income should be read in conjunction with the accompanying notes.

Statement of financial position

As at 30 June 2023

	Notes	2023 $'000	2022 $'000
Assets			
Cash and cash equivalents	*8*	55,334	29,014
Trade and other receivables	*10*	4,802	2,057
Prepayments		727	446
Total current assets		60,863	31,517
Property, plant and equipment	*11*	20,404	27,640
Right of Use Assets	*7*	1,531	566
Intangible assets	*12*	726	1,121
Total non current assets		22,661	29,327
Total assets		83,524	60,844
Liabilities			
Trade and other payables	*13*	8,822	4,147
Lease liabilities	*7*	477	303
Employee benefits	*14*	2,128	1,961
Total current liabilities		11,427	6,411
Lease liabilities	*7*	1,019	249
Employee benefits	*14*	307	256
Total non current liabilities		1,326	505
Total liabilities		12,753	6,916
Net assets		70,771	53,928
Equity			
Retained earnings		70,771	53,928
Total equity		70,771	53,928

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

Statement of changes in equity

For the year ended 30 June 2023

	Notes	2023 $'000	2022 $'000
Opening balance	*16*	53,928	53,484
Total comprehensive income			
Profit (Loss) for the year	*16*	16,843	444
Total comprehensive income for the period		16,843	444
Closing balance	*16*	70,771	53,928

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

Statement of cash flows

For the year ended 30 June 2023

	Notes	2023 $'000	2022 $'000
Operating activities			
Receipts from Statutory Authority and industry		45,237	40,202
Payments to suppliers and employees		(36,873)	(34,029)
Interest on lease liabilities		(85)	-
Net cash from operating activities	9	8,279	6,173
Investing activities			
Interest received		1,358	125
Payments to acquire property, plant and equipment		(901)	(737)
Proceeds from sale of property, plant and equipment	5	18,287	80
Payments to acquire intangibles and other long term assets	12	(70)	(128)
Net cash from (used in) investing activities		18,674	(660)
Financing activities			
Repayment of principal component of lease liabilities	7	(633)	(508)
Net cash used in financing activities		(633)	(508)
Net increase in cash and cash equivalents		26,320	5,005
Cash and cash equivalents at beginning of period		29,014	24,009
Cash and cash equivalents at end of period	8	55,334	29,014

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

Notes to the financial statements

For the year ended 30 June 2023

1. Reporting entity

Sugar Research Australia Limited (the Company) is a not-for-profit company limited by guarantee, domiciled and incorporated in Australia.

The Company's registered office is at level 10, 300 Queen Street, Brisbane. The Company primarily invests in and manages a portfolio of research, development and extension (RD&E) projects that drive productivity, profitability and sustainability for the Australian sugarcane industry.

2. Basis of preparation

(a) Statement of compliance

The financial report is a general-purpose financial report that has been prepared in accordance with Australian Accounting Standards – Simplified Disclosures. This includes compliance with the recognition and measurement requirements of all Australian Accounting Standards, Interpretations and other authoritative pronouncements of the Australian Accounting Standards Board and the disclosure requirements of AASB 1060 General Purpose Financial Statements – Simplified Disclosures for For-Profit and Not-for- Profit Tier 2 Entities.

These financial statements were authorised for issue by the Board of Directors on the date of signing of the directors' declaration.

(b) Basis of measurement

These financial statements have been prepared on the historical cost basis.

(c) Functional and presentation currency

These financial statements are presented in Australian dollars, which is the Company's functional currency.

The Company is of a kind referred to in ASIC Corporations (Rounding in Financial / Director's Reports) instrument 2016/191 and in accordance with that instrument, amounts in the financial report and director's report have been rounded off to the nearest thousand dollars, unless otherwise stated.

(d) Use of judgements and estimates

The preparation of financial statements in conformity with Australian Accounting Standards – Simplified Disclosure Requirements requires management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised and in any future periods affected.

Estimation of useful lives of assets

The company determines the estimated useful lives and related depreciation and amortisation charges for its property, plant & equipment and intangible assets. The useful lives could change significantly because of technical innovations or some other event. The depreciation and amortisation charge will increase where the useful lives are less than previously estimated lives, or technically obsolete or non-strategic assets that have been abandoned or sold will be written off or written down.

Employee benefits provision

The liability for employee benefits expected to be settled more than 12 months from the reporting date are recognised and measured at the present value of the estimated future cash flows to be made in respect of all employees at the reporting date. In determining the present value of the liability, estimates of attrition rates and pay increases through promotion and inflation have been considered.

Lease agreements

-Critical judgement in identifying a lease

-Critical judgement in determining the lease term

In determining the lease term, the Company considers all facts and circumstances that create an economic incentive to exercise an extension option or remain in a leased position. Extension options are only included in the lease term if the lease is reasonably certain to be extended.

-Critical judgement in determining components of a lease

In determining the components of a lease, the Company considers all facts and circumstance that distinguish between the different components of a lease as well as any services provided within the lease contract. Where non-lease components are found, they are accounted for separately from lease components and are based on their relative stand-alone selling price. Otherwise, non-lease components are bundled together with lease components as a single lease component.

-Critical judgement in determining the appropriate discount rate

In determining the appropriate discount rate, the Company considers all fact and circumstances surrounding the lease and whether it forms part of a portfolio of leases, the current economic environment in which the Company operates, the underlying nature of the lease asset, available resources and whether the impact on the financial statements is material or not.

The Company has also identified readily observable factors to determine if the rate should change due to changes in those underlying factors.

- Critical judgement in determining whether a sale and leaseback exists

In determining whether a sale of an asset has occurred, the Company needs to consider whether the transaction qualifies as a sale of an asset. Where the transaction qualifies as a sale, judgement is required in measuring the right of use asset that relates to the portion retained by the seller – lessee. The fair value of consideration received also needs to be established in this process. This is by reference to the present value of contractual payments for the lease at market rates.

Revenue recognition

Judgement is involved in determining whether grant agreements are enforceable and sufficiently specific and whether in the scope of AASB 1058 Income of Not-for-Profit Entities or AASB 15 Revenue from Contracts with Customers. Furthermore, where under AASB 15, consideration needs to be given to the point in time or time period over which grant revenue should be recognised. For grant revenue recognised over time, the Company uses the input method which is on the basis costs incurred relative to total costs expected in satisfying the Company's performance obligation of the contract multiplied by the value of the contract. This involves estimates of total forecast contract costs.

Given the inherent nature of the unknown outcome for research projects, the knowledge and experience of the Company's managers and research staff is used in assessing the status of progress, the estimated recoverable amounts can be measured, and the associated judgement and estimates employed believed to be reasonable under the circumstances.

Costs and revenue estimates and judgement are reviewed and updated monthly, and more frequently as determined by events or circumstances. When it is probable that the total contract costs will exceed total contract revenue, the expected loss is recognised immediately.

3. Significant accounting policies

The accounting policies set out below have been applied consistently for the period presented in these financial statements.

(a) Determination of fair values

A number of the Company's accounting policies and disclosures require the determination of fair value, for both financial and non-financial assets and liabilities. When applicable, further information about the assumptions made in determining fair values is disclosed in the notes specific to that asset or liability.

(b) Foreign currency transactions

Transactions in foreign currencies are translated to the functional currency of the Company at exchange rates at the dates of the transactions.

(c) Revenue recognition

Certain Non-for-profit (NFP) transactions would only fall within the scope of AASB 15 – Revenue from Contracts with Customers, if the performance obligations are required by an enforceable contract, and they are 'sufficiently specific' to enable the NFP to determine when they have been satisfied. If the contract is enforceable and includes 'sufficiently specific' performance obligations, revenue will be recognised as performance obligations are satisfied, rather than when assets are received.

If contracts with customers or grants are concluded to be within the scope AASB 15 – Revenue from Contracts with Customers, revenue is recognised at an amount that reflects the consideration to which the Company is expected to be entitled in exchange for transferring goods or services to a customer. For each contract with a customer, the Company uses a 5-step recognition and measurement model for revenue recognition:

1. identifies the contract with a customer
2. identifies the performance obligations in the contract
3. determines the transaction price
4. allocates the transaction price to the separate performance obligations on the basis of the relative stand-alone selling price of each distinct good or service to be delivered
5. recognises revenue when or as each performance obligation is satisfied in a manner that depicts the transfer to the customer of the goods or services promised.

Variable consideration within the transaction price, if any, reflects concessions provided to the customer such as discounts, rebates and refunds, any potential bonuses receivable from the customer and any other contingent events. Such estimates are determined using either the 'expected value' or 'most likely amount' method.

The measurement of variable consideration is subject to a constraining principle whereby revenue will only be recognised to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognised will not occur. The measurement constraint continues until the uncertainty associated with the variable consideration is subsequently resolved. Amounts received that are subject to the constraining principle are recognised as a refund liability.

If grants are assessed to fall within the scope of AASB 1058 - Income of Not-for-Profit Entities - income and expense are recognised immediately in the profit and loss statement as they are incurred.

Interest

Interest revenue is recognised as interest accrues using the effective interest method. This is a method of calculating the amortised cost of a financial asset and allocating the interest income over the relevant period using the effective interest rate, which is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset to the net carrying amount of the financial asset.

Other revenue

Other revenue is recognised when it is received or when the right to receive payment is established.

Revenue from cane sales is recognised when ownership of cane transfers to the customer which is typically the point the cane is crushed.

(d) Employee benefits

(i) Defined contribution plans

A defined contribution plan is a post-employment benefit plan under which an entity pays fixed contributions into a separate entity and has no legal or constructive obligation to pay further amounts for example, a superannuation plan. Obligations for contributions to defined contribution plans are recognised as an employee benefit expense in the profit or loss in the periods during which related services are rendered by employees. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in future payments is available.

(ii) Short-term employee benefits

Short-term employee benefit obligations are measured on an undiscounted basis and are expensed as the related service is provided. A liability is recognised for the amount expected to be paid under short-term cash bonus if the Company has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

(iii) Other long-term employee benefits

The Company's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. The discount rate is the yield at the current reporting date on corporate bonds that have maturity dates approximating the terms of the Company's obligations.

(iv) **Termination benefits**

Termination benefits are expensed at the earlier of when the Company can no longer withdraw the offer of those benefits and when the Company recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

(e) Income tax

The Company is exempt from income tax under Division 50 of the Income Tax Assessment Act 1997, as amended. Under this division the Company is considered to be classified as an entity established for the purpose of promoting the development of various Australian resources, including agricultural resources and not carried on for the profit or gain of its individual members.

(f) Cash and cash equivalents

Cash and cash equivalents comprise cash balances and call deposits that are subject to an insignificant risk of change in fair value and are used by the Company in the management of its short-term commitments.

(g) Financial instruments

Investment and other financial assets

Classification

The Company classifies its financial assets in the following measurement categories:

- Those measured subsequently at fair value (either through Other Comprehensive Income, or through profit or loss), and
- Those measured at amortised cost.

The classification depends on the Company's business model for managing the financial assets and the contractual terms of the cash flows. For assets measured at fair value, gains and losses will either be recorded in profit or loss or Other Comprehensive Income.

The Company reclassifies debt investment when and only when its business model for managing those assets changes.

Measurement

At initial recognition, the Company measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset.
Debt instruments: Subsequent measurement of debt instruments are done under the amortised cost method. This is based on the Company's business model for managing asset and cash flow characteristics of the asset.

Assets that are held for collection on contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortised cost. Interest income from these financial assets is included in finance income using the effective interest rate method. Any gain or loss arising on derecognition is recognised directly in profit or loss and presented in other gains/(losses). Impairment losses are presented as separate line items in the statement of profit or loss.

(g) Property, plant and equipment

(i) **Recognition and measurement**

Items of property, plant and equipment are measured at cost less accumulated depreciation and accumulated impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the following:

- the cost of materials,
- any other costs directly attributable to bringing the assets to a working condition for their intended use,
- when the Company has an obligation to remove the assets or restore the site, an estimate of the costs of dismantling and removing the items and restoring the site on which they are located.

Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Any gains and losses on disposal of an item of property, plant and equipment (calculated as the difference between the net proceeds from disposal and the carrying amount of the item) is recognised in the profit or loss.

(ii) **Subsequent costs**

Subsequent expenditure is capitalised only when it is probable that the future economic benefits associated with the expenditure will flow to the Company. Ongoing repairs and maintenance are expensed as incurred.

(iii) **Depreciation**

Items of property, plant and equipment are depreciated from the date that they are installed and are ready for use, or in respect of internally constructed assets, from the date that the asset is completed and ready for use.

Depreciation is calculated to write off the cost of property, plant and equipment less their estimated residual values using the straight-line basis over their estimated useful lives. Depreciation is generally recognised in the profit or loss unless the amount is included in the carrying amount of another asset. Land is not depreciated.

(h) Property, plant and equipment (continued)

The estimated useful lives for significant items of property, plant and equipment are as follows:

	2023	2022
• buildings	5 - 50 years	5 - 50 years
• plant and equipment	3 - 40 years	3 - 40 years
• office equipment	2 - 15 years	2 - 15 years

Depreciation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

(i) Intangible assets

(i) **Research and development**

Expenditure on research activities, undertaken with the prospect of gaining new scientific or technical knowledge and understanding, is recognised in the profit or loss as incurred.

Development activities involve a plan or design to produce new or substantially improved products and processes. Development expenditure is capitalised only if development costs can be measured reliably, the product or process is technically and commercially feasible, future economic benefits are probable, and the Company intends to, and has sufficient resources to, complete development and to use or sell the asset. The expenditure capitalised includes the cost of materials, direct labour and overhead costs that are directly attributable to preparing the asset for its intended use, and capitalised borrowing costs. Other development expenditure is recognised in the profit or loss as incurred.

Capitalised development expenditure is measured at cost less accumulated amortisation and any accumulated impairment losses.

(ii) **Subsequent expenditure**

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, is recognised in the profit or loss as incurred.

(iii) **Amortisation**

Intangible assets, less amount impaired, are amortised on a straight-line basis in the profit or loss over their estimated useful lives, from the date that they are available for use.

The estimated useful lives are as follows:

	2023	**2022**
• Software	2 - 10 years	2 - 10 years

Amortisation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

(j) Impairment

(i) **Non-derivative financial assets**

A financial asset not classified at fair value through the profit or loss is assessed at each reporting date to determine whether there is objective evidence that it is impaired. A financial asset is impaired if there is objective evidence of impairment because of one or

more events that occurred after the initial recognition of the asset, and that the loss event(s) had a negative effect on the estimated future cash flows of that asset that can be estimated reliably.

Objective evidence that financial assets are impaired includes default or delinquency by a debtor, restructuring of an amount due to the Company on terms that the Company would not consider otherwise, indications that a debtor or issuer will enter bankruptcy, adverse changes in the payment status of borrowers or issuers, economic conditions that correlate with defaults or the lack of presence of an active market.

Financial assets measured at amortised cost

The Company considers evidence of impairment for financial assets measured at amortised cost (loans and receivables and held-to-maturity financial assets) at both a specific asset and collective level. All individually significant assets are assessed for specific impairment. Those found not to be specifically impaired are then collectively assessed for any impairment that has been incurred but not yet identified. Assets that are not individually significant are collectively assessed for impairment by grouping together assets with similar risk characteristics.

(i) **Non-derivative financial assets (continued)**

In assessing collective impairment, the Company uses trends of the probability of default, timing of recoveries and the amount of loss incurred, adjusted for management's judgement as to whether current economic and credit conditions are such that the actual losses are likely to be greater or lesser than suggested by trend analysis.

(ii) **Non-financial assets**

The carrying amounts of the Company's non-financial assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. An impairment loss is recognised if the carrying amount of an asset cash-generating unit (CGU) exceeds its recoverable amount.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGUs.

Impairment losses are recognised in the profit or loss. Impairment losses recognised in respect of CGUs are allocated to reduce the carrying amounts of assets in the CGU (or group of CGUs) on a pro rata basis.

An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

(k) Provisions

A provision is recognised if, because of a past event, the Company has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognised as a finance cost.

(l) Leases

The Company has entered into several lease arrangements primary covering properties, motor vehicles and some office equipment.

AASB 16 requires all leases to be recognised on the Balance Sheet unless the underlying asset is of low value or the lease has a term of 12 months or less. The Company recognises a 'right-of-use asset' representing its right to use leased assets and a 'lease liability', measured as the present value of future lease payments. The income statement includes depreciation of the right-of-use asset and any interest expense on the lease liability over the lease term.

Payments associated with short-term lease and leases of low-value assets are recognised on a straight-line basis as an expense in the profit or loss. Short term leases are leases with a term of 12 months or less. Low-value assets primarily comprise office equipment.

The Company has not elected to measure right of use asset at initial recognition at fair value for leases that have significantly below market terms and conditions principally to enable the Company to further its objectives.

Extension Options

Extension options are included in several property and equipment leases across the Company. The terms are used to maximise operational flexibility in terms of managing contracts. All extension options held are exercisable by the Company and not the respective lessor.

Sale and Lease back

A sale and leaseback transaction occurs when the Company enters into a contract to sell an asset and lease it back from the buyer, and the transaction qualifies as a sale. Where the transaction qualifies as a sale the Company will de-recognise the asset and apply the lease accounting requirements, measure the right of use asset as the retained portion of the previous carrying value and record again a loss on the rights transferred to the lessor. Where the transaction does not qualify as a sale the Company will continue recognition of the asset with the amounts received recorded as a financial liability.

(l) New or amended Accounting Standards and Interpretations adopted

The Company has adopted all of the new or amended Accounting Standards and Interpretations issued by the Australian Accounting Standards Board ('AASB') that are mandatory for the current reporting period.

Any new or amended Accounting Standards or Interpretations that are not yet mandatory have not been early adopted.

The adoption of these Accounting Standards and Interpretations did not have any significant impact on the financial performance or position of the Company.

(n) Current and non-current classification

Assets and liabilities are presented in the statement of financial position based on current and non-current classification.

An asset is classified as current when: it is either expected to be realised or intended to be sold or consumed in the Company's normal operating cycle; it is held primarily for the purpose of trading; it is expected to be realised within 12 months after the reporting period; or the asset is cash or cash equivalent unless restricted from being exchanged or used to settle a liability for at least 12 months after the reporting period. All other assets are classified as non-current.

A liability is classified as current when: it is either expected to be settled in the Company's normal operating cycle; it is held primarily for the purpose of trading; it is due to be settled within 12 months after the reporting period; or there is no unconditional right to defer the settlement of the liability for at least 12 months after the reporting period. All other liabilities are classified as non-current.

(o) Contract assets

Contract assets are recognised when the Company has transferred goods or services to the customer but where the Company is yet to establish an unconditional right to consideration. Contract assets are treated as financial assets for impairment purposes.

(p) Contract liabilities

Contract liabilities represent the Company's obligation to transfer goods or services to a customer and are recognised when a customer pays consideration, or when the Company recognises a receivable to reflect its unconditional right to consideration (whichever is earlier) before the Company has transferred the goods or services to the customer.

(q) Goods and Services Tax ('GST') and other similar taxes

Revenues, expenses and assets are recognised net of the amount of associated GST, unless the GST incurred is not recoverable from the tax authority. In this case it is recognised as part of the cost of the acquisition of the asset or as part of the expense.

Receivables and payables are stated inclusive of the amount of GST receivable or payable. The net amount of GST recoverable from, or payable to, the tax authority is included in other receivables or other payables in the statement of financial position.

Cash flows are presented on a gross basis. The GST components of cash flows arising from investing or financing activities which are recoverable from, or payable to the tax authority, are presented as operating cash flows.

Commitments and contingencies are disclosed net of the amount of GST recoverable from, or payable to, the tax authority.

(r) Comparatives

Where necessary, comparative information has been reclassified and repositioned for consistency with current year disclosures.

4. Revenue from operating activities

	2023 $'000	2022 $'000
Levy Funds and Matching Payments		
Industry contribution (i)	23,809	21,080
Commonwealth matching contribution (i)	7,760	6,789
Voluntary Contributions		
Queensland government income (iii)	379	766
Commonwealth government grant income (ii)	125	97
Collaboration income (iv)	5,329	3,549
Other		
Services Income (v)	823	693
Sale of cane	718	568
	38,943	33,542

(i) Industry contribution and Commonwealth matching contribution

A statutory funding contract is in place between the Commonwealth Government of Australia (Commonwealth) and Sugar Research Australia Limited. This agreement establishes terms on which the Commonwealth remits industry contributions toward research and development to the Company. This is recognised monthly on the cane crushed in that month.

The agreement also establishes the terms for Commonwealth matching contributions. Commonwealth matching contribution matches industry contribution dollar for dollar to a maximum level of 0.5% of the gross annual value of production of the sugar industry, provided conditions of the agreement are met. Revenue from the Commonwealth matching contributions are recognised based on the gazetted Gross Value of Production for the season.

(ii) Commonwealth government grant income

The Company has entered into Commonwealth Grant Agreements to fund collaborative research and development projects to support continued innovation in Australia's primary industries.

These contracts have been assessed to be enforceable and sufficiently specific and revenue is recognised over time as performance obligations are satisfied. Revenue is recognised using the input method, based on the entity's costs incurred to satisfy performance obligations relative to the total expected costs to complete the project.

If grant funding is received before the company satisfies these performance obligations, the grant will be recognised in the statement of financial position as a contract liability (Note 13) until those performance obligations are met. Conversely, if performance obligations are satisfied by the company prior to receipt of grant funds, these costs incurred are recorded as contract assets (Note 10).

(iii) Queensland government income

The company entered into grant deed agreements with Queensland government to co-invest and facilitate research and development project activity that aligns to objectives of the Department of Agriculture and Fisheries Strategic Plan.

These contracts have been assessed to be enforceable and sufficiently specific and revenue is recognised over time as performance obligations are satisfied. Revenue is recognised using the input method, based on the entity's costs incurred to satisfy performance obligations relative to the total expected costs to complete the project.

If grant funding is received before the company satisfies these performance obligations, the grant will be recognised in the statement of financial position as a contract liability (Note 13) until those performance obligations are met. Conversely, if performance obligations are satisfied by the company prior to receipt of grant funds, these costs incurred are recorded as contract assets (Note 10).

(iv) Collaboration income

Collaboration income are contributions received from third parties where the Company is collaborating with them to achieve project objectives.

Revenue amounting to $860,640 (2022: $337,500), relates to contracts without sufficiently specific performance obligations. Accordingly, this revenue has been recognised at a point in time during the financial year.

The remaining contracts have been assessed to be enforceable and sufficiently specific and revenue is recognised over time as performance obligations are satisfied. Revenue is recognised using the input method, based on the entity's costs incurred to satisfy performance obligations relative to the total expected costs to complete the project.

If grant funding is received before the company satisfies these performance obligations, the grant will be recognised in the statement of financial position as a contract liability (Note 13) until those performance obligations are met. Conversely, if performance obligations are satisfied by the company prior to receipt of grant funds, these costs incurred are recorded as contract assets (Note 10).

(v) Services income

The Company entered into agreements with third parties to provide services that would benefit the Sugar industry.

5. Other revenue

	2023 $'000	2022 $'000
Lease and rental income	163	166
Sundry income (*)	541	71
Profit on sale of assets (*)	11,761	74
	12,465	311

(*) During the year, the Company entered into an arrangement for a leaseback from a sale of property in Brisbane.
This resulted in a profit on sale of $11,736,674 and a gain on leaseback of $325,666 recorded in Sundry Income.

6. Operating expenses

	2023 $'000	2022 $'000
External research expenses	2,175	4,337
Asset and property management	2,459	2,126
Professional and consulting	2,484	3,372
Technical Research Fees	2,887	-
Research expenses	1,164	1,009
Industry consultation	357	246
Registration, subscriptions and licences	469	577
Telecommunications	513	532
Other operating costs	2,209	1,741
	14,717	13,940

7. Leases

The Company has entered into an agreement to lease office space in the Brisbane CBD for a period of five years with an option for a new lease for another three years. On renewal, the terms of the new lease are to be the same as the original lease except for minor amendments relating to lease payments, rent review and dates of the new lease.

Lease payments during the lease are to be reviewed annually and increase by a fixed percentage.

The agreement has required the Company to provide a bank guarantee for the term of the lease.

The Company also lease two properties with 10 year terms.

The Company also leases motor vehicles most of which have a term of five years.

	2023 $'000	2022 $'000
Income from sub-leases	-	-
Short-term leases	135	168
Low-value leases	18	5
Variable lease payments (not included in the measurement of the lease liability)	18	17

RIGHT-OF-USE-ASSETS

	Land and buildings $'000	Plant and equipment $'000	Office equipment $'000	Total $'000
Balance at 1 July 2022	306	236	24	566
Additions / Modifications	1,405	418	(2)	1,821
Depreciation	(423)	(424)	(9)	(856)
Balance at 30 Jun 2023	1,288	230	13	1,531

	Land and buildings $'000	Plant and equipment $'000	Office equipment $'000	Total $'000
Balance at 1 July 2021	368	267	34	669
Additions	12	386	-	398
Depreciation	(74)	(417)	(10)	(501)
Balance at 30 Jun 2022	306	236	24	566

LEASE LIABILITIES

	2023 $'000	2022 $'000
Opening Balance	552	662
Additions / Modifications	1,492	398
Interest Expense	85	-
Repayments	(633)	(508)
Closing Balance	1,496	552
Current	477	303
Non-current	1,019	249
	1,496	552

Future lease Payments	2023 $'000	2022 $'000
Due not later than one year	585	303
Due later than one year and not later than five years	1,189	249
Due later than five years	-	-
	1,774	552

8. Cash and cash equivalents

Cash and cash equivalents consist of cash on hand and balances with banks, and investments in on call term deposits. Cash and cash equivalents included in the statement of cash flows comprise the following amounts in the statement of financial position:

	2023 $'000	2022 $'000
Bank balances	5,511	3,496
Call deposits	49,823	25,518
Cash and cash equivalents	55,334	29,014
Cash and cash equivalents in the statement of cash flows	55,334	29,014

9. Cash flow reconciliation

	2023 $'000	2022 $'000
Surplus (Deficit) for the period	16,843	444
Adjustments for:		
Depreciation and amortisation	3,072	2,789
Sale & Lease back	(326)	-
Interest received	(1,358)	(125)
Profit from sale of property, plant and equipment	(11,761)	(74)
Change in working capital and provisions:		
(Increase) / Decrease in trade and other receivables, and prepayments	(3,024)	1,960
Increase in payables	4,615	1,160
Increase in provisions for employee benefits	218	19
Net cash from operating activities	8,279	6,173

10. Trade and other receivables

	2023 $'000	2022 $'000
Contract assets	4,314	1,707
Other trade receivables	488	350
	4,802	2,057
Current	4,802	2,057
Non-current	-	-
	4,802	2,057

11. Property, plant and equipment

	Land and buildings $'000	Plant and equipment $'000	Office equipment $'000	Total $'000
Cost				
Balance at 1 July 2022	25,344	15,208	763	41,315
Additions	550	492	-	1,042
Disposals	(6,995)	(102)	(172)	(7,269)
Balance at 30 June 2023	18,899	15,598	591	35,088
Accumulated depreciation and impairment losses				
Balance at 1 July 2022	(3,179)	(9,841)	(655)	(13,675)
Depreciation for the period	(403)	(1,297)	(52)	(1,752)
Disposals	482	89	172	743
Balance at 30 June 2023	(3,100)	(11,049)	(535)	(14,684)
Carrying amounts				
at 1 July 2022	22,165	5,367	108	27,640
at 30 June 2023	15,799	4,549	56	20,404

	Land and buildings $'000	Plant and equipment $'000	Office equipment $'000	Total $'000
Cost				
Balance at 1 July 2021	25,344	14,492	994	40,830
Additions	-	737	-	737
Disposals	-	(21)	(231)	(252)
Balance at 30 June 2022	25,344	15,208	763	41,315
Accumulated depreciation and impairment losses				
Balance at 1 July 2021	(2,732)	(8,486)	(830)	(12,048)
Depreciation for the period	(447)	(1,371)	(57)	(1,875)
Disposals	-	16	232	248
Balance at 30 June 2022	(3,179)	(9,841)	(655)	(13,675)
Carrying amounts				
at 1 July 2021	22,612	6,006	164	28,782
at 30 June 2022	22,165	5,367	108	27,640

Acquired assets under construction.

	2023 $'000	2022 $'000
Land and buildings	494	-
Plant and equipment	106	373
	600	373

12. Intangible assets

	Software $'000	Intellectual Property $'000	Total $'000
Cost			
Balance at 1 July 2022	2,378	8,900	11,278
Additions	70	-	70
Disposals	(61)	-	(61)
Balance at 30 June 2023	2,387	8,900	11,287
Accumulated amortisation and impairment losses			
Balance at 1 July 2022	(1,258)	(8,900)	(10,158)
Amortisation for the period	(464)	-	(464)
Disposals	61	-	61
Balance at 30 June 2023	(1,661)	(8,900)	(10,561)
Carrying amounts			
at 1 July 2022	1,121	-	1,121
at 30 June 2023	726	-	726

	Software $'000	Intellectual Property $'000	Total $'000
Cost			
Balance at 1 July 2021	2,259	8,900	11,159
Additions	128	-	128
Balance at 30 June 2022	2,387	8,900	11,287
Accumulated amortisation and impairment losses			
Balance at 1 July 2021	(854)	(8,900)	(9,754)
Amortisation for the period	(412)	-	(412)
Balance at 30 June 2022	(1,266)	(8,900)	(10,166)
Carrying amounts			
at 1 July 2021	1,405	-	1,405
at 30 June 2022	1,121	-	1,121

As at 30 June 2023 there were no intangible assets under construction (2022: nil).

Impairment charge

In the year ended 30 June 2023, there was no impairment charge.

Plant breeders' rights, with a fair value of $8,900,000 were acquired on 2 August 2013 as part of a business combination involving the acquisition of most activities of BSES Limited by the Company.

The Company has assessed the recoverable amount of the plant breeders' rights (PBR) on 2 August 2013 to be nil. The PBRs were acquired as part of the business combination and transfer of assets from BSES limited. The main source of funding of the Company is the receipt of a Statutory Levy and as a result there are no cash flows from PBRs in the Company and an $8,900,000 impairment loss has been recognised in the statement of profit or loss and other comprehensive income in the period 8 May 2013 to 30 June 2014.

13. Trade and other payables

	$'000	$'000
Trade payables	1,373	814
Other payables and accrued expenses	2,667	1,121
Contract liabilities	4,782	2,212
	8,822	4,147
Current	8,822	4,147
Non-current	-	-
	8,822	4,147

14. Employee benefits

Defined contribution superannuation plans

The Company has paid contributions of $1,606,000 (30 June 2022: $1,428,000) to defined contributions plans on behalf of employees for the reporting period.

	2023 $'000	2022 $'000
Current		
Annual Leave	893	836
Long Service Leave	1,235	1,125
	2,128	1,961
Non Current		
Long Service Leave	307	256
Total	2,435	2,217

15. Contingencies and commitments

The Company has outstanding milestone commitments of $3,677,000 (2022: $2,629,000) as at 30 June 2023.

16. Capital and reserves

The Company is a company limited by guarantee, and as such, does not have share capital. The Company's capital consists of financial assets and retained earnings.

Membership is divided into grower members (group G) and miller members (group M).

At the reporting date there were 2,645 (2022: 2,426) group G members and 9 (2022: 9) group M members guaranteeing to contribute up to $2.00 each to the property of the Company in the event of it being wound up.

17. Related parties

During the year ended 30 June 2023, the Company did not enter into transactions with related parties (2022: $50,000).

Also refer to note 19 in relation to director's fees paid under a Director Service Agreement.

Any transactions were conducted on an arm's length basis and on normal commercial terms.

No amounts remain outstanding or as commitments as at 30 June 2023 (2022: nil)

18. Audit fees

	2023	2022
Auditor of the company:		
Audit of the financial statements		
BDO	-	26,377
Pitcher Partners	50,000	35,000
Other services (*)	4,231	16,650
	54,231	78,027
Network firm of the auditor of the company:		
Other services	-	-
	-	-

(*) Other services includes internal cyber security audit (21/22) and grant audits (22/23)

19. Key management personnel compensation

The aggregate compensation made to Directors and members of key management personnel of the Company was $3,287,643 (2022: $2,957,926). Two of SRA's Directors receive their directors' fees via a Director Service Agreement.

These agreements are with Wingari Pty Ltd and Micketymulga Agribusiness Pty Ltd.

20. Events occurring after the reporting date

The financial report was authorised for issue on 24 August 2023 by the Board of Directors.

No matters or circumstances have arisen since the end of the financial year which significantly affected or could significantly affect the operations of the Company, the results of those operations or the state of affairs of the Company in future financial years.

Directors' declaration

In the opinion of the directors of Sugar Research Australia Limited ('the Company'):

(a) the financial statements and notes that are set out on pages 10 to 31 are in accordance with the Corporations Act 2001, including:

(i) giving a true and fair view of the Company's financial position as at 30 June 2023 and of its performance, for the financial period ended on that date; and

(ii) complying with Australian Accounting Standards – Simplified Disclosure and the Corporations Regulations 2001; and

(b) there are reasonable grounds to believe that the Company will be able to pay its debts as and when they become due and payable.

Signed in accordance with a resolution of the directors:

Dated at Brisbane day of 24 August 2023.

Rowena McNally

Director

PITCHER PARTNERS

Level 38, 345 Queen Street
Brisbane, QLD 4000

Postal address
GPO Box 1144
Brisbane, QLD 4001

p. +61 7 3222 8444

The Directors
Sugar Research Australia Limited
Level 10, Suite A
300 Queen Street
Brisbane QLD 4000

Auditor's Independence Declaration

In relation to the independent audit for the year ended 30 June 2023, to the best of my knowledge and belief there have been:

(i) No contraventions of the auditor independence requirements of the *Corporations Act 2001*; and

(ii) No contraventions of APES 110 *Code of Ethics for Professional Accountants (including Independence Standards)*.

Pitcher Partners

PITCHER PARTNERS

ANDREW ROBIN
Partner

Brisbane, Queensland
30th August 2023

Level 38, 345 Queen Street
Brisbane, QLD 4000

Postal address
GPO Box 1144
Brisbane, QLD 4001

p. +61 7 3222 8444

Independent Auditor's Report to the Members of Sugar Research Australia Limited

Report on the Audit of the Financial Report

Opinion

We have audited the financial report of Sugar Research Australia Limited ("the Company"), which comprises the statement of financial position as at 30 June 2023, the statement of profit or loss and other comprehensive income, the statement of changes in equity and the statement of cash flows for the year then ended, notes to the financial statements including a summary of significant accounting policies, and the directors' declaration.

In our opinion, the accompanying financial report of the Company is in accordance with the *Corporations Act 2001*, including:

(a) giving a true and fair view of the Company's financial position as at 30 June 2023 and of its financial performance for the year then ended; and
(b) complying with Australian Accounting Standards – Simplified Disclosures and the *Corporations Regulations 2001*.

Basis for Opinion

We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Report* section of our report. We are independent of the Company in accordance with the auditor independence requirements of the *Corporations Act 2001* and the ethical requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants (including Independence Standards)* ("the Code") that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

We confirm that the independence declaration required by the *Corporations Act 2001*, which has been given to the directors of the Company, would be in the same terms if given to the directors as at the time of this auditor's report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other Information

The directors are responsible for the other information. The other information comprises the information included in the Company's annual report for the period ended 30 June 2023, but does not include the financial report and our auditor's report thereon.

Our opinion on the financial report does not cover the other information and accordingly we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial report, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial report or our knowledge obtained in the audit or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of the Directors for the Financial Report

The directors of the Company are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards – Simplified Disclosures and the *Corporations Act 2001* and for such internal control as the directors determine is necessary to enable the preparation of the financial report that gives a true and fair view and is free from material misstatement, whether due to fraud or error.

In preparing the financial report, the directors are responsible for assessing the ability of the Company to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Financial Report

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

As part of an audit in accordance with the Australian Auditing Standards, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial report or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Company to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial report, including the disclosures, and whether the financial report represents the underlying transactions and events in a manner that achieves fair presentation.

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

Pitcher Partners

PITCHER PARTNERS

ANDREW ROBIN
Partner

Brisbane, Queensland

30th August 2023

REPORTING TO FUNDING AND COLLABORATION PARTNERS

Performance Principles

The Guidelines for the Statutory Funding Agreement 2021-2031 between SRA and the Australian Government acting through the Department of Agriculture, Fisheries and Forestry (DAFF) include five interlinked Performance Principles, each with several Key Performance Indicators (KPIs), including stakeholder engagement, research, development and extension (RD&E) activities, collaboration, governance, and monitoring and evaluation.

Stakeholder engagement

Strategy prioritisation and development processes include appropriate consultation plans, based on the *Best practice guide to stakeholder engagement*.

SRA's Engagement and Consultation Plan was developed and implemented in 2022 to demonstrate alignment between SRA's strategy prioritisation and development processes and the Best practice guide to stakeholder consultation by DAFF. The Plan is also used to enhance our interactions with stakeholders, in support of our vision, purpose and strategy. Moreover, each of SRA's key plans that document strategy prioritisation and development processes also detail how stakeholders are engaged.

Demonstrated stakeholder engagement in the identification of RD&E priorities and activities consistent with the *Best Practice guide to stakeholder engagement*.

In 2022/23, SRA staff engaged 1,019 stakeholders, an increase of 290 stakeholders from the previous year. Engagement activities sought to achieve a range of strategic objectives including, but not limited to, identifying research priorities and productivity constraints, delivering field days and workshops to support adoption.

Moreover, feedback from levy payers and partners suggests there is a strong perception of engagement by SRA staff with industry. In 2022/23, 66 per cent of growers, 53 per cent of millers, and 76 per cent of research investors and partners, rated SRA staff as very active or active in engaging in industry matters and events.

Demonstrated incorporation of stakeholder feedback on RD&E priorities and activities. Where incorporation is not possible, demonstration of feedback to a stakeholder/s on why incorporation was not possible.

In 2022/23, SRA completed initiatives in response to stakeholder feedback including, but not limited to, consultation with milling companies separately from growers about investment planning, delivery of activities within each district to address productivity constraints experienced by local growers, millers and other stakeholders, and coordination of more events to transfer knowledge about new products and management practices.

Research, development and extension activities

RDC investments align with strategic plans and have demonstrated outcomes to levy payers and taxpayers, including through growth in the industry, increased profitability of producers, commercialisation, or access to new markets.

In 2022/23, all RD&A activities aligned with the outcomes detailed in SRA's research missions in the Strategic Plan and government and industry priorities and outcomes (see page 113). Expenditure on delivering RD&A activities was $35.5 million, an increase of $2 million from the previous year.

SRA balances its research portfolio based on time to delivery and technology feasibility risk. In 2022/23, SRA's research portfolio consisted of 43 investments that could be rated using Technology Readiness Levels (TRLs) to assess the maturity of technologies for deployment to industry as products. The balance of SRA's portfolio is as follows:

- $0.2M invested in early-stage technologies (TRLs 1-2), such as a virus pest control, representing 1 per cent of the portfolio that can be rated using TRLs. These technologies have a long delivery time requiring ongoing investment to be validated in experimental and commercial environments before deployment. They are defined as high risk in terms of technology feasibility.

- $2.5M invested in mid-stage technologies (TRLs 3-6), such as a method to coat milling roll surfaces, representing 7 per cent of the portfolio. These technologies have a medium delivery time requiring further investment to be validated in commercial environments before deployment. They are defined as medium risk.
- $15.3M invested in late-stage technologies (TRLs 7-9), such as the Harvest Mate app, representing 43 per cent of the portfolio that can be rated using TRLs. These technologies have a short delivery time, and in some cases, have already been deployed or are soon-to-be for use as products. These technologies typically require relatively minimal investment and as they have been demonstrated commercially they are defined as low risk.

Note this excludes $17.5M invested in delivering RD&A activities that could not be rated using TRLs.

Of levy payers who participate in RDC supported extension and adoption programs: The majority (over half) have gained new knowledge or new information to improve their long-term profitability, productivity, competitiveness and preparedness.

In 2022/23, 95 per cent of levy payers and industry stakeholders who attended SRA led training and adoption activities reported satisfaction with knowledge to improve their business profitability, productivity, and preparedness (average score of 8.0 on a scale of 0-10, an increase of 0.2 from the previous year).

Of levy payers who participate in RDC supported extension and adoption programs: The majority (over half) intend to make or have made changes to existing practices by adopting the outcomes of R&D.

In 2022/23, 69 per cent of levy payers reported that they have adopted or have plans in place to adopt products or production practices developed by SRA, an increase of 1 per centage point from the previous year.

Collaboration

Completed, current and future R&D including commercialisation opportunities is accessible through the growAG platform.

In 2022/23, 92 per cent of projects that received funding by SRA, and were active during the reporting period, were accessible through the growAG platform, an increase of 26 per centage points from the previous year.

Number and quantum of cross-industry and cross-sector RD&E investments available.

In 2022/23, SRA collaborated with other RDCs on eight cross-sectoral projects, a small decline from nine projects from the previous year. Total quantum of cash investment by SRA and partners for these projects is approximately $15 million, excluding ongoing payments for cross-RDC initiatives.

Number and quantum of RD&E projects and commercialisation projects listed on growAG, including commercialisation outcomes.

In 2022/23, there were 77 projects which received funding from and/ or were managed by SRA reported on growAG, an increase of 35 projects from the previous year.

Governance

Ongoing oversight, planning and reporting of investment activities is done in accordance with legislative and Australian Government requirements and timeframes.

In 2022/23, SRA reported zero breaches and related actions in accordance with legislative and Australian Government requirements, reflecting no change from the previous year.

Demonstrated management of financial and non-financial risk.

In 2022/23, SRA commissioned Pitcher Partners to complete an external financial audit that reported no material findings. In addition, SRA appointed Deloitte to complete four internal reviews to improve risk management of areas including cyber security, procurement, payroll, and project cost allocation. SRA is now implementing recommendations from these reviews and is undertaking another four reviews during 2023/24.

SRA also has financial and non-financial policies and procedures, code of conducts, and charters, in place for governance and risk management. In addition to SRA's Board, there are four established committees to monitor risk including the Audit and Risk Committee, People, Performance & Remuneration Committee, Research Funding Panel, and Director Selection Committee.

Relevant policies and procedures adopted and implemented (whistle-blower, privacy etc).

SRA's Code of Conduct contains principles and standards of conduct which are based on SRA's values and represents our commitment to uphold ethical business practices and meet applicable legal requirements. The Code of Conduct is supported by governance policies to guide how SRA does business and outline expected standards of behaviour, including, but not limited to, the Board Governance Policy, Diversity Policy, Compliance Policy, and Whistle-blower Policy.

Non-financial resources implemented effectively (Human resources, IT, IP etc).

SRA employs contemporary best practices to ensure non-financial resources related to human resources are implemented effectively. These include workforce diversity targets in the Strategic Plan, routine benchmark reporting with the Workplace Gender Equality Agency, employee engagement and culture measurement, and routine monitoring and response to legislative changes.

Monitoring and evaluation

Impact (cost-benefit) assessment of a random sample of RD&E investments undertaken annually.

In 2022/23, 11 impact assessments using benefit-cost analysis were completed on RD&A activities. Results from six assessments were not available at the time of writing, however, the assessments that could be quantified recorded a high aggregate return on investment ratio of $72.8 to $1 based on strong economic benefits delivered to industry, an increase from $5.7 to $1 recorded the previous year.

Demonstrated consideration of and response to outcomes of monitoring and evaluation processes.

In 2022/23, results from completed assessments were reported to staff to inform learning and improvement and communicated to levy payers and industry stakeholder via SRA communications. Moreover, in response to feedback from industry surveys, SRA undertook several actions to build engagement and increase familiarity with business plans, products, and research portfolio by industry stakeholders, and to disseminate clear and practical information about new research and products.

Transparent communication to stakeholders (including government) on the impacts and benefits of the RD&E activities.

In 2022/23, SRA reported 14 case studies (including four impact assessments) publicly via SRA's communication channels, an increase from nine (including two impact assessments) in the previous year.

Statutory Funding Agreement 2021-2031: Annual Reports

Under SRA's Statutory Funding Agreement 2021-2031, the following items must be included in SRA's Annual report 2022/23. This table provides a cross-reference on where to locate the relevant information throughout the report.

ITEM	Requirement	Location in Annual Report
a	Sources of income allowing for separate identification of Levy Funds, Matching Payments and Voluntary Contributions	Operating income and expenditure summary – p22 Financial statements – p84
b	Significant R&D activities and transactions undertaken in the year in the conduct of SRA's functions as the Industry services body	Strategic pillars 2-5 – p29 Research missions 1-5 – p50
c	The full cost of the R&D Activities	Operating income and expenditure summary – p22
d	Progress made in implementing the Strategic Plan and Performance Principles including progress against any key performance indicators	Research missions 1-5 – p50 Reporting to funding and collaboration partners – p107
e	Key RD&E deliverables and associated outcomes achieved	Strategic pillars 2-5 – p29 Research missions 1-5 – p50

ITEM	Requirement	Location in Annual Report
f	An assessment of the efficiency and effectiveness of SRA's investments	Research impact reported in Pillar 2 – p31 Reporting to funding and collaboration partners (performance principles) – p 107
g	Material changes to SRAL's membership	No material change recorded in 2022/23 More information is reported in the Director's Report - p78
h	How SRA responded to any directions made under the Act or Rural Research and Development Priorities given by the Minister under the Agreement or the Guidelines	No specific directions made in 2022/23 More information is reported in Reporting to funding and collaboration partners (performance principles) – p107
i	Consultation with Levy Payers and Industry Representative Organisations on: SRAL's Strategic Plan; and RD&E	Pillar 3: Translation expertise – p34 Pillar 4: World-class sugarcane varieties (regional variety committees) – p40 Reporting to funding and collaboration partners (performance principles) – p107
j	SRAL's contributions to relevant sugar industry sectoral and cross sectoral strategies, including strategies under the National Primary Industries Research Development and Extension Framework	Strategic Pillar 2 – p29 Research missions 1-5 – p50 Sugar plus industry roadmap – p74 Reporting to funding and collaboration partners (alignment to government and industry priorities) – p107
k	Details of senior executive and Board remuneration in the format required by the relevant Australian Accounting Standards	Financial statements (key management personnel compensation) - p101
l	Research and Developments agreements entered into by SRAL with third parties	Research missions 1-5 – p50
m	Corporate governance practices in place during the Financial Year	Corporate governance framework – p14
n	The rationale for the mix of projects included in the Balanced Portfolio	Operating income and expenditure summary – p22 Reporting to funding and collaboration partners (research, development and extension activities) – p107
o	Other matters notified to SRAL by the Commonwealth	Not applicable

Co-Investment with Department of Agriculture and Fisheries

The Sugarcane RD&E Funding Deed 2022/23 to 2026-27 between SRA and the Queensland Government acting through the Department of Agriculture and Fisheries (DAF) outlines how funding will be provided to SRA by DAF for RD&A projects that will support the prosperity of the sugarcane industry and benefiting the regional communities of Queensland.

In 2022/23, there were 12 projects that received co-funding by DAF and SRA. These are reported in the following section along with their alignment to DAF's Sugarcane Strategic Objectives.

Project	Alignment to DAF Sugarcane Strategic Objective	Principle Investigator
2017/002 Implementing and validating genomic selection in SRA breeding programs to accelerate improvements in yield, commercial cane sugar, and other key traits	1. Fast track the uptake of new transformational breeding technologies to remain globally competitive in producing high yielding and disease resistant varieties.	University of Queensland
2017/901 Managing Climate Variability – Phase 5 Forewarned is forearmed: equipping farmers and agricultural value chains to proactively manage the impacts of extreme climate events	13. Conduct research to improve the resilience of sugarcane farming systems in response to climate change	Bureau of Meteorology
2018/010 Moth Borers – how are we going to manage them when they arrive?	11. Evaluate and develop new sugarcane defence systems.	SRA
2020/001 Environmental Risk Assessment & Life Cycle Assessment of the Raw Sugar Manufacturing	17. ZNE production systems, including energy decarbonisation; 18. Improve waste utilisation across the supply chain for higher value products; 19. Develop farming systems that support increased biodiversity; 22. Optimise use of inputs such as such as chemicals, nutrients and water to improve sustainability.	Integrity Ag & Environment
2020/003 Maximising cane recovery through the development of a harvesting decision-support tool	5. Harvest efficiencies that can be translated to industry	SRA
2020/004 Beyond Imidacloprid - Chemical and Biorational Alternatives for Managing Canegrubs	9. Improve the management of economically significant endemic pests and diseases; 11. Evaluate and develop new sugarcane defence systems.	SRA
2020/007 Environmental DNA Technologies and Predictive Modelling for Rapid Detection and Identification of Sugarcane Priority Pests	9. Improve the management of economically significant endemic pests and diseases.	EnviroDNA
2020/008 Transformational crop protection – Innovative RNAi biopesticides for management of sugarcane root feeding pests	9. Improve the management of economically significant endemic pests and diseases; 10. Increase and improve knowledge and management strategies to address economically significant endemic weeds.	University of Queensland

Project	Alignment to DAF Sugarcane Strategic Objective	Principle Investigator
2020/013 Oil Canes Part 1: Technical readiness and regulatory assessment	15. Develop alternative products or uses of sugarcane that will provide options to growers for Sugarplus.	University of Queensland
2021/002 Pre-commercial development, testing and validation of RSD LAMP assay for sugar mill roll-out	9. Improve the management of economically significant endemic pests and diseases.	University of Queensland
2021/007 Green market opportunities for the sugarcane industry	14. Provide research that underpins new opportunities in sugarcane diversification based on market and consumer demand. 15. Develop alternative products or uses of sugarcane that will provide options to growers for Sugarplus	Central Queensland University
2021/008 Australian Sugarcane Sustainability Framework	17. ZNE production systems, including energy decarbonisation; 18. Improve waste utilisation across the supply chain for higher value products; 19. Develop farming systems that support increased biodiversity; 20. Systems that manage the reserves and cycling of soil nutrients and carbon to maintain soil functionality; 21. Develop systems and management practices that will improve the biological health of soils and reduce soil degradation; 22. Optimise use of inputs such as such as chemicals, nutrients and water to improve sustainability.	Roth Rural

Alignment to Government and Industry Priorities

SRA is committed to listening to our investors, understanding their needs and responding to these needs through innovative R&D solutions that are successfully adopted and deliver impacts for the industry, as well as benefits for the broader Australian community.

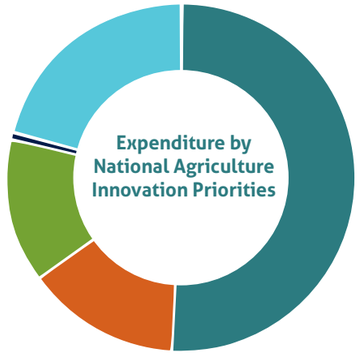
The key RD&A activities laid out in this AOP respond, within the constraints of our budget, to the priority challenges and opportunities of the sugarcane industry and more broadly, the priorities of the agricultural innovation system, government, and the wider public. These priorities include those noted in the following strategic documents:

- National Agricultural Innovation Policy Statement, 2021
- Australian Government's Science and Research Priorities, Australian Government, 2015
- Rural Research, Development and Extension Priorities, 2015
- National Sugarcane Industry Research, Development and Extension Strategy, 2017
- Queensland Department of Agriculture and Fisheries Sugarcane Strategic Objectives, 2022
- Sugar Plus Industry Roadmap, 2022

These priorities together ensure RD&A investment is strategic, collaborative, and targeted to improve profitability, productivity, competitiveness and preparedness for future opportunities and challenges.

The charts on the opposite page illustrate SRA's expenditure for 2022/23 by the National Agricultural Innovation Priorities, Australian Government's Science and Research Priorities, and Rural Research, Development and Extension Priorities.

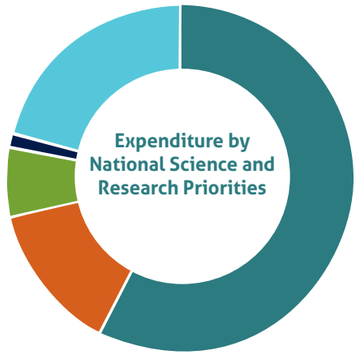
Expenditure by National Agricultural Innovation Priorities



PRIORITY	MILLION
Trusted exporter of premium food and agriculture products	$18.0M
Other*	$7.4M
World leader in preventing and rapidly responding to significant pests and diseases through future-proofing our biosecurity system	$5.1M
Champion of climate resilience to increase the productivity, profitability, and sustainability of the agricultural sector	$4.7M
Mature adopter, developer and exporter of digital agriculture	$0.2M
TOTAL INVESTMENT	**$35.5M**

Numbers are rounded.

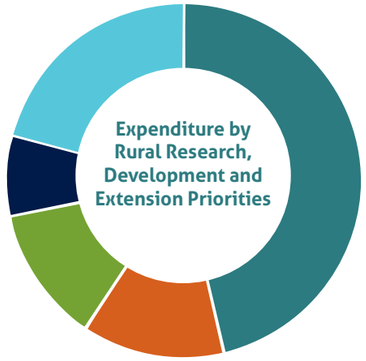
Expenditure by National Science and Research Priorities



PRIORITY	MILLION
Food	$20.4M
Other*	$7.4M
Soil and water	$4.9M
Advanced manufacturing	$2.3M
Environmental change	$0.4M
Transport	$0M
Cybersecurity	$0M
Energy	$0M
Resources	$0M
Health	$0M
TOTAL INVESTMENT	**$35.5M**

Numbers are rounded.

Expenditure by Rural Research, Development and Extension Priorities



PRIORITY	MILLION
Advanced technology	$16.4M
Other*	$7.4M
Biosecurity	$4.6M
Soil, water and managing natural resources	$4.4M
Adoption of r&d	$2.6M
TOTAL INVESTMENT	**$35.5M**

Numbers are rounded.

**Other includes collaboration across the agricultural sector with rural research and development corporations and Agriculture Innovation Australia and corporate support and other initiatives.*

Alignment of SRA's Research Missions to Industry and Government Priorities

The table illustrates alignment between priorities and SRA's research missions.

Stakeholder Priorities	1 Profitable and Productive	2 Resilient and Enduring	3 Diversified and adaptable	4 Wealth generating through land stewardship	5 Skilled for the future
National Sugarcane Industry Research, Development and Extension Strategy					
Products: Expanding uses for sugarcane	◆		◆	◆	◆
Productivity: Achieving significant productivity gains and increasing adoption	◆	◆		◆	◆
Stewardship: Improving environmental performance and industry's social licence		◆		◆	◆
People: Building the capability of industry and research			◆	◆	◆
National Agricultural Innovation Priorities					
Trusted exporter of premium food and agricultural products	◆		◆	◆	
Australia will champion climate resilience to increase the productivity, profitability and sustainability of the agricultural sector		◆			
Australia is a world leader in preventing and rapidly responding to significant pests and diseases through future-proofing our biosecurity system		◆			
Australia is a mature adopter, developer and exporter of digital agriculture	◆				◆
National Science and Research Priorities					
Food	◆	◆		◆	
Soil and water				◆	
Transport			◆		
Cybersecurity					
Energy	◆		◆	◆	
Resources					
Advanced manufacturing	◆		◆	◆	◆
Environmental change	◆	◆	◆	◆	◆
Health					

Stakeholder Priorities	1 Profitable and Productive	2 Resilient and Enduring	3 Diversified and adaptable	4 Wealth generating through land stewardship	5 Skilled for the future
Rural Research, Development and Extension Priorities					
Advanced technology	◆		◆		
Biosecurity		◆			
Soil, water and managing natural resources				◆	
Adoption of R&D	◆	◆	◆	◆	◆
Queensland Department of Agriculture and Fisheries Strategic Objectives – Investment Areas					
New breeding technology	◆				
Optimised production	◆			◆	
Maximised harvest	◆				
Transformational technologies	◆		◆		
Plant protection*		◆			
Regional scenario planning		◆			
New products and value-chains			◆		
Environmental sustainability*				◆	
Soil biology and optimised use of inputs for sustainability*				◆	
Collaboration and innovation design			◆		◆
Data driven agronomic decisions and digital solutions	◆			◆	◆
Understanding the sugarcane system – beliefs, influencers and drivers			◆		◆
Sugar Plus: Australia's Sugarcane Roadmap					
Reliability	◆			◆	◆
Efficiency	◆			◆	◆
Scale				◆	◆
Growth	◆		◆		◆

*Investment area title given by SRA

Rural Research and Development Corporations Impact Indicators

In response to the National Agricultural Innovation Agenda, Research and Development Corporations (RDCs) have developed a suite of 10 indicators that align with its pillars and demonstrate the value and impact of RDCs to Australia's innovation system.

The following table details SRA's progress against the indicators for 2022/23.

Indicator	Purpose	Performance
Return on investment of RDC expenditure	To demonstrate that RD&E expenditure delivers value to key stakeholders (inc. levy payers).	In 2022/23, SRA and partners recorded an aggregate benefit-cost ratio of $72.8 to $1, an improvement on $5.5 to $1 from the previous year.
Economic contribution (direct and indirect value add ($) and # of full-time equivalents)	To demonstrate the economic contribution of RDC actions/investments to regional, state and national economies.	Baseline will be reported in future reports.
Productivity (% change in multifactor productivity)	To demonstrate that agriculture's productive capacity is improving overtime in a multi-faceted way.	Baseline will be reported in future reports
Leverage (non-government) (annual % change in new funding attracted each year)	To demonstrate RDCs are generating leverage from their funding opportunities and pools outside of government and levy payer contributions.	Baseline will be reported in future reports
Collaboration (# of projects and $ spend on joint or cross RDC projects)	To demonstrate that RDCs are working effectively with each other.	In 2022/23, SRA collaborated with other RDCs on eight cross-sectoral projects, a small decline from nine projects from the previous year. Total quantum of cash investment by SRA and partners for these projects is approximately $15 million, excluding ongoing payments for cross-RDC initiatives.
Capability (# of research qualifications (i.e. PhDs) and post-doctoral fellowships supported by RDCs)	To demonstrate the RDC's contribution to human capital development.	In 2022/23, SRA supported 11 research qualifications including post-doctoral fellowships, PhDs, Masters, and undergraduate degrees, a decrease from 22 positions recorded in the previous year.
Service satisfaction (% of RDC levy payers or members are satisfied with RDC services.)	To demonstrate stakeholder satisfaction with RDC services from those stakeholders who either contribute financially to the services or are impacted directly by the services.	In 2022/23, 72 per cent of growers and 68 per cent of millers reported satisfaction with SRA's overall performance, representing an increase from the previous year of five and three per centage points respectively.
Stakeholder satisfaction % of RDC levy payers or members are satisfied with RDC engagement activities.	To demonstrate stakeholder satisfaction with RDC engagement activities from those stakeholders who either contribute financially to the activities or are impacted directly by the activities.	In 2022/23, 66 per cent of growers reported satisfaction with engagement by SRA staff on industry matters and events, an increase from 52 per cent recorded the previous year, Using a different measure, in 2022/23, millers reported average satisfaction with engagement, on a scale of 0-10, 5.4, a decrease from 6.8 recorded in the previous year.
Sustainability (a) Does the RDC have an agenda (Y/N) (b) How long has the current agenda been in place? (years) (c) What are some achievements demonstrated?	To demonstrate how the RDCs are contributing to and providing leadership in the area of sustainability (animals, people(social), environmental – land &/or water).	SRA's Strategic Plan 2021-2026 includes the dedicated Research Mission 4 Wealth generation through land stewardship, which aims to position the Australian sugarcane industry as leaders in profitability, environmental sustainability, and resource-use efficiency. In 2022/23, Research Mission 4 included 13 projects targeting outcomes including, but not limited to, improving water quality, increasing water use efficiency, and identifying green market opportunities for sugarcane growers. Moreover, it also includes a project, co-funded by SRA and DAF, to develop the Australian Sugarcane Sustainability Framework.
Diversity and inclusion ((a) Does the RDC have an agenda (Y/N) (b) How long has the current agenda been in place? (years) (c) What are some achievements demonstrated	The demonstrate how the RDCs are contributing to and providing leadership in the area of diversity and inclusion.	SRA's Strategic Plan 2021-2026 includes outcome targets to increase the diversity of SRA's workforce. These include targeted gender diversity and workforce demographics that represent the communities in which SRA operates. SRA's progress toward diversity and inclusion objectives are outlined at Strategic Pillar 1 – Strong Foundations from pxx.

Sources: SRA; SRA's 2023 and 2022 Grower and Miller Survey Reports by Intuitive Solutions; and Cost Benefit Analysis of Selected Research Programs by ACIL Allen.

COMPLIANCE CHECKLIST

The following checklist shows SRA's compliance with key annual reporting requirements completed during 2022/23 in accordance with the company's Constitution, the *Corporations Act 2001 (Cth)*, the *Sugar Research and Development Services Act 2013 (Cth)* and the Statutory Funding Contract 2021-2031.

Annual Reporting Requirements	What SRA Delivered 2022/23
Annual Report requirements - SRA Constitution (rules 22.6, 24.3) The Board must include in the Annual Report for each financial year: a report on the operations of the Committees specified in the Constitution during the year; and a report on the operations of the code of conduct during the year including how the Board dealt with material breaches (if any).	*Annual Report 2022/23* p21 refers to the operations of each Committee; and *Annual Report 2022/23* p21 refers to the operations of the SRA Code of Conduct.
Annual reporting to members of a company limited by guarantee - *Corporations Act 2001* (Cth) (section 316A) A member of a company limited by guarantee may, by notice in writing to the company, elect to receive a hard copy or an electronic copy of the: the financial report; and the directors' report; and the auditor's report. The company must send a copy of the above listed reports, free of charge, to each member who has made an election for that financial year, in accordance with the election, by the earlier of: 21 days before the next Annual General Meeting (AGM) after the end of the financial year; and four (4) months after the end of the financial year.	*Annual Report 2022/23* p78 contains the financial report, directors' report and auditor's report. Members have been advised in the Notice of Annual General Meeting dated on or about 16 November 2023 that they may, by notice in writing, elect to receive a hard copy or an electronic copy of the financial report, directors' report and auditor's report. An electronic copy was made available to the members via the SRA website at **www.sugarresearch.com.au.**
Laying reports before AGM - *Corporations Act 2001* (Cth) (section 317) The directors of a public company must lay before the AGM: the financial report; and the directors' report; and the auditor's report for the last financial year that ended before the AGM.	*Annual Report 2022/23* to be presented to AGM scheduled for 16 November 2023
Lodging Annual Report with ASIC - *Corporations Act 2001* (Cth) (section 319) A company must lodge the annual report with the Australian Securities and Investments Commission (ASIC) within four months after the end of the financial year.	*Annual Report 2022/23* to be sent to ASIC within four months after the end of the financial year.
Annual Report to include any direction from the Minister - *Sugar Research and Development Services Act 2013* (Cth) (section 11(4)) The Industry Services Body must, within 14 days of lodging a financial report (the annual report), give the Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Murray Watt, a copy of the report. The report must comply with section 295 of the *Corporations Act 2001* and section 11 of the *Sugar Research and Development Services Act 2013 (Cth).*	No written direction from the Minister for Agriculture pursuant to section 11 of the *Sugar Research and Development Services Act 2013* (Cth), was given to SRA as Industry Services Body during the financial year.
Provision of Annual Report to the Commonwealth - Statutory Funding Contract 2021–2031 (clause 12.1) SRA to do certain things as follows: must prepare an annual report complying with the *Corporations Act 2001 (Cth)* and the requirements of the Statutory Funding Contract 2021-2031 and must publish on its public website by 31 October 2023, a copy of its *Annual Report 2022/23.*	*Annual Report 2022/23* to be published on SRA website by 31 October 2023.

Sugar Research Australia®

Sugar Research Australia Limited
ABN 16 163 670 068

Brisbane Office Level 10, 300 Queen Street Brisbane QLD 4000 Australia
Postal Address GPO Box 133 Brisbane QLD 4068 Australia

T 07 3331 3333
E sra@sugarresearch.com.au
sugarresearch.com.au