SUGAR RESEARCH AUSTRALIA LIMITED

ANNUAL REPORT

2021/22

Sugar Research Australia®

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(Cover) *Harvesting a variety trial at Bundaberg. Image by Jason Schneeloch.*
(Left) *Plant breeding at SRA's Burdekin Station. Image by Chandra Patel.*

Sugar Research Australia Limited

Brisbane Office 50 Meiers Road, Indooroopilly QLD 4068 Australia
Mailing Address PO Box 86 Indooroopilly QLD 4068 Australia

T 07 3331 3333
F 07 3871 0383
E sra@sugarresearch.com.au
sugarresearch.com.au

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SRA AT A GLANCE

Sugar Research Australia (SRA) is the nation's specialist sugarcane research organisation. SRA invests 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

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.

STRATEGIC PILLARS

Strategic Pillar 1
Strong foundations

Strategic Pillar 2
A high-performing research portfolio

Strategic Pillar 3
Translation expertise

Strategic Pillar 4
World-class sugarcane varieties

Strategic Pillar 5
Commercial benefits and rewards

HOW WE OPERATE

We actively engage with industry.

We constantly seek opportunities to innovate and improve.

We take a long-term view.

We create opportunities for collaboration.

We act ethically and responsibly.

Our foundations

History

SRA was established in 2013 as a sugarcane grower-and miller-owned company and the declared Industry Services Body for the Australian sugarcane industry. At its formation, SRA was created as part of an amalgamation of the former entities, the Sugar Research and Development Corporation (SRDC) and the BSES (formerly the Bureau of Sugar Experiment Stations). Nine years after its inception, SRA is a vital component of the overall sugar industry supply chain, working in close partnership with growers, millers and service providers to deliver meaningful impact on the ground.

Funding

SRA's revenue is obtained primarily through the statutory sugarcane levy and Commonwealth Government matching funding for eligible research and development (R&D) activities, managed through the Department of Agriculture, Fisheries and Forestry.

The statutory sugarcane levy of 70 cents per tonne of cane has remained constant since 2013, with growers and millers each contributing 35 cents per tonne of cane.

Importantly, statutory levies and Commonwealth matching funds enable SRA to form co-investment partnerships by leveraging resources to engage in larger research programs than SRA could fund alone. During the year, SRA was involved in co-investment partnerships with a number of other rural research and development corporations, as well as the Cooperative Research Centre for Developing Northern Australia (CRCNA), the Queensland Department of Environment and Science, the Great Barrier Reef Foundation, the Commonwealth Department of Climate Change, Energy, the Environment and Water (Reef Trust), and the Australian Research Council.

SRA also enjoys significant support and co-investment from the Queensland Department of Agriculture and Fisheries through the Sugar Research and Development Funding Deed.

	2022	
Revenue	**($'000)**	**(%)**
Statutory Sugarcane Levy	21,080	62
Commonwealth Matching Funds	6,789	20
Queensland Government*	766	2
Other co-investments	3,549	11
Services income	693	2
Interest	125	0
Other income	976	3
Total	**33,978**	**100**

SRA has a grant deed agreement with the 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.

Any grant income received during the financial year for which conditions have not been fulfilled has been moved to contract liabilities. The decrease in the revenue recognised from the Queensland Government is mainly due to:

- *delays in contracting new projects due to expiry of the old deed and subsequent extension sign-off in late December 2021*

2021/22 HIGHLIGHTS

$31M
invested in

61
research projects, plus industry services and plant breeding

87%
of growers satisfied with research portfolio

$444K
net surplus

$396.9M
net value delivered to industry by SRA's RD&A investments assessed in 2021/22

Collaborative development for

1st
industry roadmap

Number of clones superior to the commercial standard increased to **208**

100%
Best Management Practice accreditation of SRA farms

91%
of milling representatives satisfied with research portfolio

754 district-level engagements with **4248** stakeholders*

18 scholarships supported

88 tonnes reduction in dissolved inorganic nitrogen through environmental programs

56% improvement in ratio of net investment per percentage point of genetic gain for new varieties

Lost time injury frequency rate **60%** lower than previous year

Every **$1** invested in RD&A delivered $5.50 in economic value

>100 research partners and collaborators

*Stakeholders may have attended more than one engagement event and therefore may have been counted multiple times.

MESSAGE FROM THE **CHAIRPERSON**

Since becoming Chairperson of SRA at the 2021 Annual General Meeting (AGM), it has been my great pleasure to again be a part of the Australian sugarcane industry. On behalf of the SRA Board, welcome to the Sugar Research Australia Annual Report 2021/22.

I have been privileged during my eight months as Chairperson of SRA to see many familiar faces from my previous roles as Sugar Industry Commissioner and with the Sugar Authority and Queensland Sugar Corporation. There have also been new connections made during engagement sessions across our sugarcane growing districts and I have valued the considered and honest feedback received from individuals and organisations about expectations and priorities for our industry.

During 2021/22, SRA commenced implementing its 2021-2026 strategic plan. Engagement was an important focus in co-developing the strategy with industry and it has remained central to how SRA is delivering on the objectives outlined in the plan, with regular engagement events and sessions conducted across our districts.

Working in partnership and collaboration with growers, millers and services providers to strengthen the industry, the past year has seen a heightened focus on addressing the most pressing challenges and constraints facing the industry, both at the local level and across the whole industry.

There has been much work undertaken to develop a foundational research investment plan aligned to the new strategy. This has also involved direct input from industry representatives to ensure research and innovation investment targets what matters most to industry.

Within SRA, our team continued work to stabilise SRA's financial position and positively delivered a net surplus for the past financial year.

The year has not been without challenge for our industry with pressures from rising input costs and floods which damaged crops and mills in northern New South Wales. Unseasonal rain has also brought delays to the harvest across multiple districts. Yet, our growers and millers have shown great resilience and I have heard much optimism for the future.

As a research organisation, it is important that SRA addresses the needs of today, while keeping an eye on the future. An important research initiative was undertaken over the past year, culminating in the release of a shared vision and roadmap for the industry, *Sugar Plus – Fuelling the Future of Food, Energy and Fabrication.*

Prior to the roadmap's release, I joined directors and leaders of industry representative organisations and funding partners at a sugar industry leaders' forum. It was encouraging to hear the strong commitment to the vision of becoming 'a vibrant, transforming industry, sustainably producing sugar and bioproducts'. The roadmap sets out measures to strengthen and build the industry, while charting a path to a bigger, bolder future with actions focused on better business-as-usual, adding value to operations and unlocking the opportunities presented by the bioeconomy.

As the specialist research and development corporation (RDC) for the sugarcane industry, SRA works closely with the Council of Rural Research and Development Corporations to ensure sugar is well represented in policy discussions in Canberra. During the year, we met with funding providers and the Commonwealth, and worked to build SRA's profile and brand in the research community.

The Federal Government has outlined priority focus areas for biosecurity, exports and climate, along with transformation of the RDC sector, something SRA is well positioned for.

Rowena McNally

> *The roadmap sets out measures to strengthen and build the industry, while charting a path to a bigger, bolder future with actions focused on better business-as-usual, adding value to operations and unlocking the opportunities presented by the bioeconomy.*

The SRA Board met in Mackay in April and travelled to Far North Queensland in June to meet with local growers and mill representatives (pictured).

SRA has signed a new 10-year Statutory Funding Contract with the Federal Government for 2021-2031. The agreement includes new performance principles, which reflect a greater need to demonstrate outcomes and outputs from research, along with new guidelines for funding agreements, knowledge transfer and commercialisation, and stakeholder engagement. I've been pleased to see the work happening internally for SRA to meet these expectations of government and industry.

At our upcoming AGM, SRA will seek some minor administrative corrections and enhancements to its Constitution resulting from recent changes to the Corporations Act regarding electronic meetings and procedures.

Consultation has also commenced on proposed constitutional changes relating to our research program strategy and project selection. These proposals involve changes to the current Research Funding Panel and consultation on these matters will continue during 2023.

SRA's work is built on partnerships and collaboration, and we could not operate without the support of many individuals and organisations:

- growers and millers – who are the primary investors in SRA through the joint 70 cents per tonne levy
- industry organisations – the Australian Sugar Industry Alliance, CANEGROWERS, the Australian Sugar Milling Council, Australian Cane Farmers Association, and AgForce, as well productivity services groups, and extension providers
- the Commonwealth and Queensland Governments, who provide co-investment into SRA
- external research providers and investors
- members of the Research Funding Panel
- SRA's employees, who deliver on our values of teamwork, investor satisfaction, accountability, and innovation
- our Chief Executive Officer Roslyn Baker, who continues to provide energy and strong leadership for SRA and the industry
- my fellow SRA Board directors for their contribution and support.

The past financial year has seen several changes at the Board level, including the retirement of our previous long-serving Chair Dr Ron Swindells and the departures of Dr Guy Roth and Lee Blackburn. We were joined by Mark Day who is experienced in the sugar industry and Rowley Winten, an international marketing professional experienced in agriculture.

In closing, I want to acknowledge the service of two SRA directors who will not seek re-election at our upcoming AGM. Lindy Hyam has served SRA since October 2016 and Dr Jeremy Burdon since October 2019. We have been stronger for their contribution, and I, along with their fellow directors, thank them for their commitment.

I look forward to continuing to work with members of the industry, research and funding providers, the SRA team and my fellow directors to drive positive outcomes for the sugarcane industry.

MESSAGE FROM THE **CHIEF EXECUTIVE OFFICER**

This is the first year of implementing SRA's 2021-2026 strategic plan.

The increasing challenges that millers and growers face is the driving reason the industry depends on SRA to be at the forefront in innovation and efficiency as a research, development and adoption (RD&A) organisation.

The challenges are many - input costs are rising substantially, there is ongoing seasonal variability, consequential impacts on existing endemic threats, soil health and water quality, as well as the ever-present risks of new incursions.

Research and development have always played an important role in keeping the industry profitable, sustainable, and resilient, and the role of research and development in helping the industry step up to future challenges will be no less important. This is particularly the case when considering crop protection, pest and disease management, and variety development. For example, biosecurity risks have gained much public attention this year due to concerns about foot and mouth disease and lumpy skin disease for the livestock sector. Plant biosecurity is equally important, and one of SRA's most important investment roles is to develop mitigants for biosecurity risks to the sugarcane industry. Further innovations in variety development will also be underpinned by leveraging technologies and techniques that increase selection efficiency and response.

Pleasingly, 2021/22 saw the release of several new varieties which are showing promise for yield and resilience - QS10-445 and SRA38$^{\Phi}$ were approved in the Southern district, SRA36$^{\Phi}$ in the Herbert and SRA37$^{\Phi}$ in the Far North. Multiple varieties were also approved for production in additional regions, with SRA9$^{\Phi}$, SRA26$^{\Phi}$, SRA32$^{\Phi}$ and SRA34$^{\Phi}$, all candidates for broadscale adoption.

Whilst many of the challenges and opportunities we are facing today are not new to agriculture or even the Australian sugar industry, the global and regulatory environment is becoming more complex. SRA's focus and programs, must catalyse breakthrough technological and scientific innovations to develop rapid response and recovery capabilities and long-term sustainable advantages in productivity and profitability.

This year, SRA has refocused its research priorities in alignment with our Research Missions. In the past 12 months we have built a new foundation for research investment, with a renewed emphasis on developing dynamic and targeted research and private sector collaborations, rethinking our investment and funding models, and reviewing how we monitor and evaluate the effectiveness of our portfolio to ensure it meets the needs of industry and our investors.

Ongoing and local level engagement with industry to establish and review research priorities and impact, remains pivotal to ensuring our research remains relevant and impactful. This year we significantly strengthened our approach to local industry engagement with the implementation of our district engagement model, embedding the five new District Managers into their roles, and developing specific District Plans designed to address key constraints affecting productivity in each local region.

Building on this local level engagement, SRA's third strategic pillar is *Translation Expertise,* which recognises that the job of delivering value from research does not finish with the publication of a report, but that an important next step is to clearly communicate the research findings to drive implementation and adoption. During 2021/22 we delivered research information to growers through a range of on-line and face-to-face events, including webinars, field days, training sessions and workshops. SRA has also improved the content contained within our variety guides for industry, recognising the importance of appropriate variety selection to productivity.

Roslyn Baker

Research and development have always played an important role in keeping the industry profitable, sustainable, and resilient, and the role of research and development in helping the industry step up to future challenges will be no less important.

Pleasingly, stakeholder surveys, undertaken in the final quarter of 2021/22, have indicated that growers and millers are feeling more satisfied with the work of SRA. We know there is more to do to continue growing stakeholder satisfaction and it will remain a strong focus for our teams over the coming year.

In partnership with industry, SRA has also been examining some exciting opportunities for the future with the development of a Sugar Industry Roadmap. *Sugar Plus – Fuelling the Future of Food, Energy and Fabrication* identifies a bright future, with potential to unlock vast opportunities through the bioeconomy. The direction provided by the roadmap will underpin the industry's research priorities and was an improvement opportunity recommended in SRA's 2020 *Independent Performance Review*. Having released the roadmap, we will continue working with industry organisations to implement the actions identified through the process; strengthening the industry's long-term viability through better business-as-usual, adding value to current operations, and creating new value.

While undertaking the roadmap development, we have also progressed feasibility studies into diversification opportunities including green hydrogen and compostable bioplastics to understand how the economics stack up.

This year has seen SRA deliver a financial surplus through delivery on our savings plan, which includes reduced expenses and workforce savings. However, the year has not been without its challenges with delays in capital expenditure flowing from the unavailability of trades and supply chain issues for equipment.

SRA also had a mixed year on the safety front, with our key metric of total recordable injury frequency rate (TRIFR) moving from 24 at the beginning of the year to 43 by year end. This is a disappointing result as we have invested substantial effort towards improving our safety performance throughout the year. Our efforts did result in some positive trends emerging by the end of the financial year with SRA's serious injury frequency rate remaining at zero against the 2021 Queensland agriculture industry benchmark rate of 9.9. Further, SRA has achieved 11 months free from lost time injuries and seven months free from recordable injuries. While we are now noticing some positive trends our TRIFR result certainly reminds us that our focus on safety must remain unwavering.

Importantly, SRA signed a new 10-year Statutory Funding Contract with the Commonwealth, committing to new performance principles, as well as new guidelines for funding agreements, knowledge transfer and commercialisation, and stakeholder engagement. We also signed an extension for the Sugarcane Research, Development and Extension Funding Deed with the Queensland Government to October 2022. The Deed provides funding to SRA for sugar research development activities. We look forward to signing a new Deed with the State for funding through to 2028.

During the year, rainfall events brought considerable disruption to operations, particularly with extensive flood impacting our New South Wales operations, water damage at our Indooroopilly site necessitating repairs and closure of some parts of the facility, and flooding around Woodford forcing the postponement of industry workshops and events. Against this challenging backdrop, we continued to support the industry with limited disruption to our diagnostics and screening services.

In presenting this Annual Report, I thank the SRA team who have been through another year of change and transition and continue to demonstrate their passion and commitment to the Australian sugarcane industry.

Our work is possible thanks to the contribution and support of our grower and miller investors, who are the focus of all that we do at SRA. Many growers and millers also contribute significant time and energy in SRA activities, such as participation in engagement sessions, meetings and advisory groups, and assisting with on-farm trials.

And for the ongoing support provided to SRA, I would also like to acknowledge and thank CANEGROWERS, the Australian Sugar Milling Council, Australian Cane Farmers Association, AgForce, regional industry organisations, productivity services providers and our research collaborators, including commercial entities and research institutions.

Thank you also to the following for their co-investments into SRA: 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 Cooperative Research Centre for Developing Northern Australia; the Great Barrier Reef Foundation; and the Australian Research Council.

Finally, I thank the SRA Board for their strategic advice and support throughout the year. I look forward to continuing to work with you all to improve SRA and deliver on our strategic plan to ensure we have a sustainable and innovative SRA for the Australian sugarcane industry.

Field Days returned to SRA's Stations in 2022 allowing grassroots engagement with growers.

ABOUT SRA

Why we exist

SRA keeps the Australian sugarcane industry competitive, productive, and sustainable through innovative research and product development.

What we do

As the declared Industry Services Body for the Australian sugarcane industry under the *Sugar Research and Development Services Act 2013* (Cth), SRA is responsible for the direct provision of research, development and adoption (RD&A) activities as well as the ongoing management and investment of funds received from industry levy payers and government, for the benefit of the sugarcane industry and for the wider public good. The fundamental responsibilities of SRA are to:

- deliver cost-effective research and development services to the Australian sugar industry to enhance its viability, competitiveness and sustainability
- carry out, coordinate and provide investment for R&D activities in relation to the Australian sugar industry
- facilitate the dissemination, extension, adoption and commercialisation of results of R&D activities
- support and develop industry research capacity.

The SRA research effort extends across the industry and occurs for all growers and millers.

Where we operate

To support close engagement with stakeholders and strengthen visibility of industry needs, SRA maintains eight research stations and six farms across nine regional locations stretching along the east coast from north Queensland to northern New South Wales. At these farms and stations, SRA teams deliver research and development, biosecurity and plant breeding activities, providing real-world experimentation and trials.

All SRA farms are accredited under Smartcane BMP to 100 per cent compliance. This accreditation captures SRA's commitment to the Industry Best Practice standard for its farm operations. It further sets an important base for good environmental practice across the regional sites.

SRA's employees operate in a range of roles that support and drive RD&A for the Australian sugarcane industry.

Our in-house capability

SRA is uniquely positioned with extensive in-house research and adoption capability with 125 employees who work in metropolitan and regional Queensland and northern New South Wales across critical research disciplines including:

Entomology
Plant pathology
Agronomy
Environmental science
Farming machinery and engineering
Digital agriculture, geo-spatial and data science
Plant breeding
Plant physiology
Agricultural economics
Biosecurity

LEADERSHIP

The Board

SRA has a skills-based Board of Directors responsible for the overall governance and strategic direction of the organisation. The Board of Directors in place following SRA's Annual General Meeting (AGM) in October 2021 was:

Rowena McNally – Chairperson

Dr Jeremy Burdon

Lindy Hyam

Mark Day

Peter Russo

Rowley Winten

Sam (Salvatore) Bonanno

We extend our gratitude for the service of Dr Ron Swindells and Dr Guy Roth who served on the SRA Board until the October 2021 AGM and Lee Blackburn who was on the Board until 29 July 2021.

Further information on the role of the Board, along with the Directors' Report is provided from page 88 of this Annual Report.

The Executive Team

SRA has an Executive Team leading key business units with defined responsibilities and accountabilities. Each area of the business is led by an executive manager who reports to the Chief Executive Officer. The CEO reports to the Board. The Executive Team in place at 30 June 2022 was:

Roslyn Baker
Chief Executive Officer

Duncan Ferguson
Executive Manager Commercial Development*

Hywel Cook
Executive Manager Industry Services

Janeene Fitzgerald
Executive Manager Safety, People and Culture**

Dr Jason Eglinton
Executive Manager Variety Development

Lauren Seymour
Executive Manager Corporate Services***

Michael Shannon
Company Secretary/ General Counsel

**Dr Harjeet Khanna departed the General Manager Research Investments position in December. Accountabilities now sit with Executive Manager Commercial Development.*
***Dayle Grant held the interim position of Executive Manager Safety, People and Transformation until 25 November 2021, prior to Janeene Fitzgerald advancing to Executive Manager Safety, People and Culture on 28 November 2021.*
****Jane Sing fulfilled the role of Executive Manager Corporate Services from 1 July 2021 to 31 March 2022. Amir Megahed subsequently acted in the role until Lauren Seymour joined SRA on 30 May 2022.*

TAKING A STRATEGIC VIEW

SRA's *Strategic Plan 2021-2026* was released in July 2021, following extensive engagement with industry stakeholders. The strategy 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 is themed to align with the strategy's five strategic pillars and five Research Missions.

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 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.

OUR RESEARCH MISSIONS

RESEARCH MISSION 1	**PROFITABLE AND PRODUCTIVE** Continuous improvement in farming and milling profitability.
RESEARCH MISSION 2	**RESILIENT AND ENDURING** Position the industry to stay ahead of climate, environmental and biosecurity threats.
RESEARCH MISSION 3	**DIVERSIFIED AND ADAPTABLE** Capitalise on changing consumer preferences, and the growing bio and green economies to develop diversification opportunities.
RESEARCH MISSION 4	**WEALTH GENERATING THROUGH LAND STEWARDSHIP** Position the Australian sugarcane industry as leaders in profitability, environmental sustainability and resource-use efficiency.
RESEARCH MISSION 5	**SKILLED FOR THE FUTURE** Support the development of an adaptable, professional, commercial and entrepreneurial industry and research community.

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.

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

Financial security and agile cost-base

In line with its *Strategic Plan 2021-2026*, SRA aims to achieve a small net surplus each year from 2022 to support a sustainable financial position that is no longer reliant on cash reserves.

SRA's 2021/22 budget targeted a modest surplus of $180,000. We outperformed this target to achieve a positive net position of $444,000. This was achieved through a concerted focus on controlling discretionary spending. The team also worked to increase returns from commercial endeavours and non-traditional grant funding.

SRA achieved a net positive cash position of $5 million, against a budgeted $2.1 million. Our year-end cash position was $29 million, compared with $24 million in 2021.

Projections for continued financial sustainability and a small net surplus each year (excluding extraordinary one-off items) are based on four key dependencies:

- profit from a collaborative research consultancy – where researchers consult at commercial market rates
- profit from commercialisation opportunities
- continued delivery of efficiency savings
- levies based on 30 million tonnes per annum.

Our ability to drive further efficiencies is dependent on fit-for-purpose, integrated technology solutions to streamline and automate insights, knowledge capture and reporting. Work to develop a whole-of system technology transformation plan will be a critical body of work during 2022/23.

Property strategy and planning

SRA has committed to develop and implement an asset strategy to lower the total cost of ownership across asset classes and to optimise property assets.

During the past year, SRA undertook a strategic property review at its Indooroopilly site with a view to relocating employees to a leased site and selling the property.

Financial statements in this Annual Report note the sale of the Indooroopilly site as an event occurring after the 30 June reporting date.

The property settled on 30 September 2022 and SRA exercised an option to lease the property back. The Indooroopilly site will continue to accommodate SRA's administrative employees and laboratory functions while suitable alternative accommodation is finalised.

Work was also undertaken to ensure all property assets are in a serviceable condition. Preliminary work has commenced on a property review of the Mackay site which is in need of significant refurbishment.

Rain and flooding impacts

Heavy rain and flooding that severely affected northern New South Wales and South-East Queensland in early 2022, brought impacts to SRA operations at Indooroopilly, Woodford and Broadwater.

The Indooroopilly property experienced water inundation and a ceiling collapse in the chemistry laboratory, while water also inundated the ground floor of the administration building. Employees were required to work from home and chemistry laboratory staff were subsequently relocated to other parts of the facility. An insurance claim was approved and repair works have been completed.

Woodford was twice impacted by flooding, with access to the site affected by road closures. While buildings were not damaged, fencing needed repair after waters subsided.

In New South Wales, SRA employees occupy space at Sunshine Sugar's Broadwater site. With Broadwater significantly flooded, mill and SRA operations were impacted. Staff were relocated to temporary accommodation provided by Sunshine Sugar.

The flooded entrance to SRA's Woodford station.

A safe workplace

SRA has maintained a strong focus on moving towards a proactive safety culture of learning and continuous improvement, with health, safety and environment (HSE) integrated into our way of working.

Despite this focus, our total recordable injury frequency rate (TRIFR) rose from 24 to 43 following several medical treatment injuries early in the financial year, reinforcing the need to continue with the safety improvement plan.

The main achievements against the safety improvement plan were the development of SRA's health and safety management system and implementation of a safety management and leadership program. The program was delivered to leaders across the business, including field-based leaders, through workshops conducted at Meringa, Mackay and Brisbane, supported by virtual "teams" deployment sessions.

Health and safety engagement activities included promotion of safe work week, with themed events across sites.

During February, SRA commissioned an independent external HSE compliance audit. All audit findings were managed to ensure effective systemic resolution and monitoring. As actions have been completed and evidence documented, the external auditor has independently reviewed the evidence and verified compliance with legislative requirements.

Improvements in the safety management system and the leadership development program contributed to the following outcomes:

- a strong reporting culture with HSE hazard and incident reporting increasing 24 per cent in the past 12 months and averaging 16 per cent higher than the previous three years
- no reportable environmental incidents
- a 74 per cent improvement in investigation cycle completion times
- increased risk awareness, understanding and registers developed throughout sites
- SRA's lost time injury frequency rate (LTIFR) ended the year 60 per cent lower than the previous year – falling from ten to four
- SRA's serious injury rate reduced from six to zero, well below the industry average for Queensland and Australia. Recent data shows an average serious injury rate for Agriculture in Queensland of 9.9, compared with 9.6 nationally (source: *Key work health and safety statistics Queensland 2021*, Safe Work Australia)
- SRA is working with industry and universities to explore innovative solutions to further mitigate risks where the business is undertaking field activities.

Culture and engagement

SRA undertook a culture and engagement survey during 2022 to determine its current and ideal culture. The survey is based on the Human Synergistics Organisational Culture Inventory (OCI) and Organisational Effectiveness Inventory (OEI).

The engagement result of 75.4 per cent placed SRA ahead of the average 74.8 per cent, a solid foundation from which to target the constructive (top-performing) benchmark of 82 per cent.

Outcomes at an individual level were above average for clarity of role, motivation and intention to stay, role alignment and management of stress. The main opportunities for improvement relate to satisfaction and job security.

Group outcomes reflected strong intra/inter and department level cooperation and coordination. However, scores around beliefs in relation to the delivery of high-quality services and products to external clients and how SRA recognises and responds to changes in our external environment, present some opportunities for improvement.

Having completed the survey, the business will now undertake action planning and identifity focus areas for improvement.

Members of SRA's entomology team during an engagement event at Mareeba – Holly Farnan, Dr Kevin Powell, Dr Samuel Bawa and PhD student Hang Xu.

A diverse workforce

SRA has placed a concerted focus on improving its diversity profile and promoting inclusion.

An online discrimination, sexual harassment and bullying training module was updated through the year, with a completion rate of 98.5 per cent.

Representatives of the people and culture team attended a Reconciliation Action Plan (RAP) information session presented by Reconciliation Australia, with a view to progressing development of a RAP during 2022/23. Acknowledgement of Country and our First Nations People has formed an integral part of internal and external stakeholder meetings during the past financial year.

By 2025, SRA is striving to have a diverse workforce that is reflective of the communities in which we operate in terms of numbers of Indigenous employees, employees with disabilities and employees from non-English speaking backgrounds.

We have also targeted gender diversity, with a goal that 50 per cent of senior leadership and researcher positions are occupied by women by 2022 and 50 per cent of Board positions are held by women by 2024. While the past financial year saw positive movement towards these objectives, there remains further work to do. Women hold 43.5 per cent of senior leadership and research positions in the organisation, an increase from last year. Gender diversity on the Board also increased towards the 2024 target.

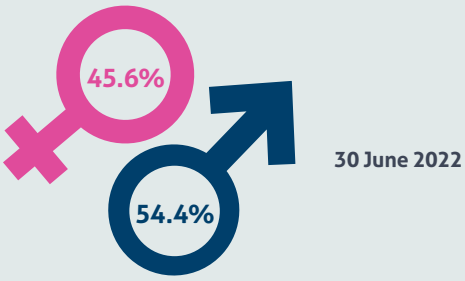
An initiative undertaken during the year as part of SRA's remuneration framework was the creation of an internal position-grading evaluation panel. The panel supports SRA's commitment to diversity, engagement and building a high-performance culture.

Gender equity was a focus in a review of scientific roles across SRA. Benchmarking through the Workplace Gender Equality Agency (WGEA) showed SRA performed favourably against industry trends for lowering the median gender pay gap. SRA's gender pay gap reduced from 7.3 per cent to 5.3 per cent placing it n the top 10 per cent of the comparison group. WGEA's report indicates that every industry in Australia has a pay gap favouring men when comparing the average pay of men and women across the organisation as-a-whole.

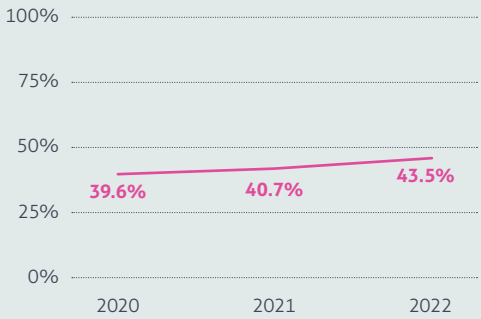
Female and male staff

30 June 2020 = 43.4% female, 56.6% male

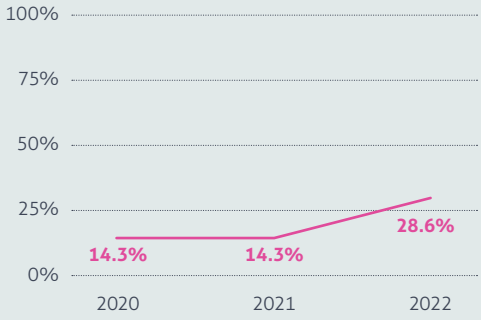
30 June 2021 = 41.2% female, 58.8% male



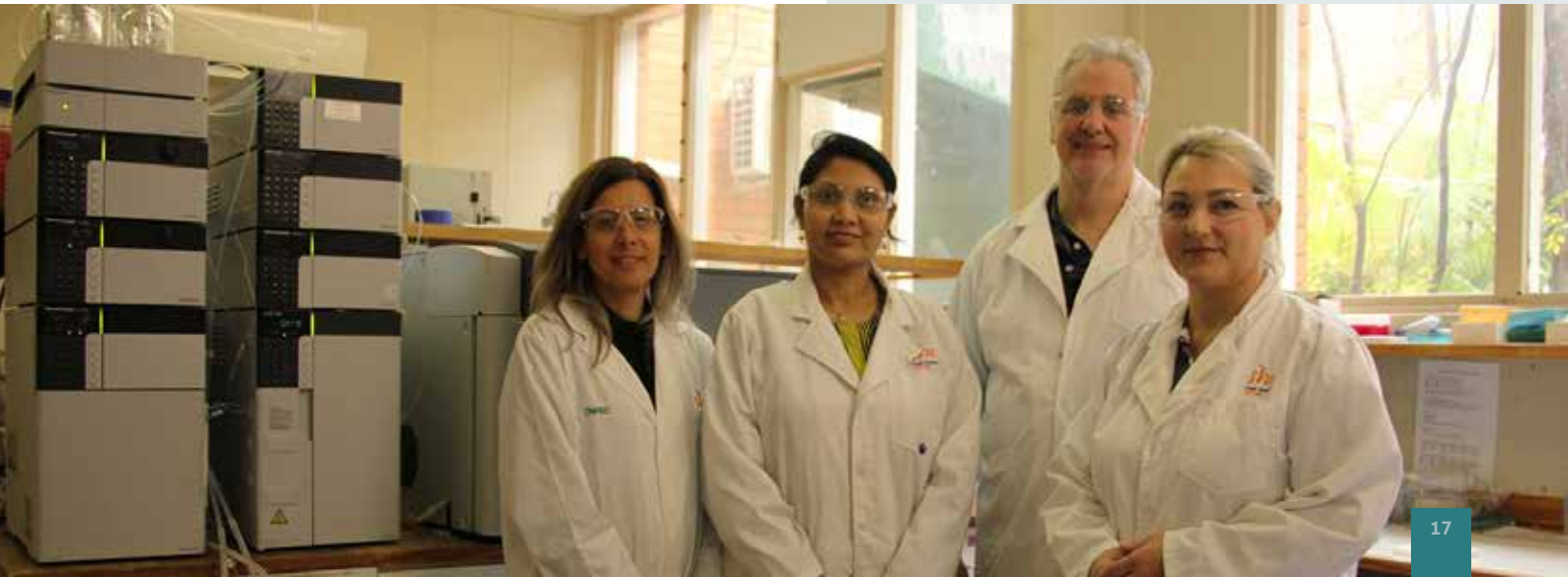
Female leaders and researchers



Board positions occupied by women
Target 50% by 2024



SRA's Chemistry Laboratory team members at Indooroopilly: Peimaneh Lee-Steere, Farzana Darain, Andrew Lynch and Heidi du Clou.



Strategic Pillar 1: Outcome measures

Deliver small year-on-year surpluses

Target – Deliver small year-on-year surpluses (measured based on underlying results and not including decisions to strategically invest reserves)

Result – SRA outperformed the budget target to achieve a positive net position of $444,000, above the original target of $180,000. This was achieved through a concerted focus on controlling discretionary spending and increased returns from commercial endeavours and non-traditional grant funding.

Source: SRA

SRA operates within approved reserves thresholds

Target – SRA operates within approved thresholds

Result – SRA was not reliant on cash reserves to operate, generating a net positive cash position of approximately $5 million. Year-end cash position was $29 million.

Staff engagement

Target – Achieve progressively improved staff engagement by 2022 (against the SRA leadership index and staff engagement index)

Result – Results from SRA's culture and engagement survey indicate an engagement score of 75.4%. This places SRA ahead of the average 74.8%, a solid foundation from which to target the constructive (top-performing) benchmark of 82%.

Source: Human Synergistics Organisational Culture Inventory and Organisational Effectiveness Inventory

Safety maturity

Target – Achieve safety maturity against safety improvement plans by 2023

Result – The main achievements against the safety improvement plan were in continuing to develop SRA's health and safety management system and the development and implementation of a Safety Management and Leadership program. In relation to the former, 50% of the 12 standards were revised and deployed, with the final 50% to be delivered in 2022/23. During the same period, the Safety Management and Leadership program was delivered to business leaders.

Source: SRA

Culture maturity

Target – Progress towards cultural attributes of a learning and innovative culture

Result – Results from SRA's culture and engagement survey suggest there is strong intra/inter and department level cooperation and coordination. However, scores around beliefs in relation to the delivery of high-quality services and products to external clients and how SRA recognises and responds to changes in our external environment, present some opportunities for improvement.

Source: Human Synergistics Organisational Culture Inventory and Organisational Effectiveness Inventory

Gender diversity (staff)

Target – Ensure that 50% of senior leadership/ researcher positions within SRA are occupied by women by 2022

Result – SRA increased the number of senior leadership and research positions occupied by women from 40.7% to 43.5% over the period. Over the same period, SRA increased the total number of positions occupied by women across the organisation from 41.2% to 45.6%.

Source: SRA

Gender diversity (Board)

Target – 50% of SRA board positions are occupied by women by 2024

Result – The proportion of board positions occupied by women increased from 14.3% to 28.6%.

Source: SRA

Workforce demographics

Target – 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

Result – 56% of SRA staff responded to a voluntary survey reporting the following results: 30% of staff are from a non-English speaking background, 5.8% identify as having a physical or cognitive disability, 55% have caring responsibilities for children, elderly parents/family members or those with a disability, and 1.4% identify as Indigenous.

Source: SRA

STRATEGIC PILLAR 2
A HIGH-PERFORMING RESEARCH PORTFOLIO

Design a focused, balanced and collaborative portfolio of research, development and extension 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's research portfolio seeks to tackle the biggest challenges and opportunities facing the Australian sugarcane industry.

The past financial year saw continued progress under the multi-year research projects contracted under the previous strategic plan, and a strong focus on shaping a new *Annual Investment Plan* that targets outcomes in specific industry-identified areas.

This section of the annual report outlines the approach for developing the new investment plan, progress and impacts of various research initiatives, and details of collaborative and cross-sectoral projects. It also discusses SRA's progress against key tactics, outcomes and success measures in the strategic plan in relation to our five Research Missions.

SRA's research investment in 2021/22 by Research Mission

The graph shows the 2021/22 investment of $31 million across the five Research Missions.

RESEARCH MISSION	MILLION
RM1 PROFITABLE AND PRODUCTIVE	$17.59M
RM2 RESILIENT AND ENDURING	$5.38M
RM3 DIVERSIFIED AND ADAPTABLE	$1.12M
RM4 WEALTH GENERATING THROUGH LAND STEWARDSHIP	$5.52M
RM5 SKILLED FOR THE FUTURE	$1.40M
Total investment	**$31M**

Numbers are rounded.

Annual Investment Plan

Extensive industry and stakeholder engagement was undertaken in developing SRA's strategic plan, with more than 700 industry engagements culminating in the plan's release in July 2021. Since then, further engagement has helped shape a foundational investment plan, the first aligned with the new strategy.

SRA's *Annual Investment Plan* (AIP) sets the direction and guides practical delivery of SRA's research investment. It provides the basis to inform levy payers, industry representative organisations, the Australian and Queensland Governments, and the wider industry about planned research investment. For the first time, the AIP describes SRA's investment across each of our Research Missions and related strategic pillars, reflecting the full value of SRA's research, development and adoption investment.

The AIP identifies the most impactful investment areas to support the industry and achieve SRA's purpose to keep the Australian sugarcane industry competitive, productive and sustainable through innovative research and product development.

Involving industry

Co-creation of the 2022/23 *Annual Investment Plan* began with a survey issued to around 140 stakeholders to identify primary problems to be addressed. Five teams were subsequently formed representing each research mission. Each team comprised five to nine representatives of industry, including SRA employees, growers, millers, researchers and academics, agtech and logistics representatives, social scientists, the Queensland Department of Agriculture and Fisheries and other investors and advisory representatives.

Teams, involving about 60 stakeholders, participated in multiple workshops and conducted three rounds of further interviews with industry stakeholders to understand underlying root problems and prioritise solutions that offer the biggest impact to industry.

The process sought to challenge assumptions, shift perspectives and identify better ways of working with industry to deliver impactful research.

The following principles guided prioritisation of new research investment for the coming year:

- stakeholder engagement and feedback
- the significance of the problem to the industry
- the progress and impact of current and previous investments
- the likely contribution new investment will make to the Strategic Plan's measures of success.

Priorities for new investment

New investment is planned under the following priority areas during 2022/23:

- technology application for a step change in productivity and profitability
- transformational technologies (milling)
- biosecurity surveillance, preparedness and response
- optimising disease, weed and pest management
- sustainable crop protection
- climate resilience and mitigation
- soil health - balanced nutrient management and overcoming soil constraints
- new products and value chains
- understanding the customer
- data-driven agronomic decisions.

SRA team members and industry representatives discuss research challenges and priorities during a research investment planning workshop.

Annual Investment Plan Summary

RESEARCH MISSIONS	ROOT PROBLEM	CHALLENGE STATEMENT
Research Mission 1 Profitable and productive	New varieties need to clearly contribute to increased productivity and profitability for the industry, so growers have greater confidence in them.	New breeding technology
		Plant breeding
	Growers are diverse, and have different soils, climate and environmental conditions. They also have varying personal motivations and familiarity with technology. Research, products and services need to be tailored to meet their diverse needs.	Planting decisions and variety choice
		Technology application for a step change in productivity and profitability
		Maximising the harvest
	Mills have varied levels of financial resilience and are under substantial pressure to increase near-term profits. This reduces their ability to invest time and capital in long-term, research-based innovation opportunities.	Transformational technologies
Research Mission 2 Resilient and enduring	There is limited awareness of existing and emerging risks from pests, diseases and weeds (biotic threats). There are also threats to the use of existing management solutions that could impact yield, productivity and industry viability. The development and adoption of effective, integrated, and sustainable management systems for biotic threats are not widely prioritised.	Biosecurity surveillance, preparedness, and response
		Optimising disease, weed and pest management
		Sustainable crop protection
	The industry is focused on addressing immediate pressures and has not proactively sought to fully understand the impacts of climate change. As a result, there is inadequate planning and preparation for future needs and opportunities.	Climate resilience and mitigation
Research Mission 3 Diversified and adaptable	Current economic activity is not sufficient to maintain the industry in the long term. Diversification opportunities need individual assessment to understand the fit for the district/mill, as well as grower implications.	New products and value-chains
Research Mission 4 Wealth generating through land stewardship	Growers have different motivations for increasing environmental stewardship. For those who are financially motivated, technology is needed to reliably create and measure environmental products and services.	Sustainability – soil carbon, reef and biodiversity
	With pressure on inputs, growers are seeking improved resource-use efficiency including irrigation systems, labour, energy costs, and time, while at the same time reducing the impact on natural and fragile ecosystems.	Soil health – balanced nutrient management and overcoming soil constraints
		Irrigation
		Integrated farming systems
Research Mission 5 Skilled for the future	Practices, products and services are not typically designed to meet the needs of a broad range of industry end-users. To achieve widespread adoption and impact, innovations need to match user needs and characteristics and be technically robust.	Understanding the customer
		Collaboration and innovation design
	Low technology readiness, infrastructure limitations, and poor integration of digital solutions are impacting the adoption of digital technology that can enable improved efficiency, value, and innovation.	Data-driven agronomic decisions
		Digital solutions

Research impact

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

In 2021/22, SRA commenced an important update of its monitoring and evaluation (M&E) framework to improve measurement and reporting of the performance and impact of the research portfolio, and to drive improvements in investment planning. This update was in response to SRA's *Strategic Plan 2021-2026* objectives and SRA's *Independent Performance Review* completed in 2020/21.

Key changes include expanding M&E to all investments, regardless of funding source and type of research and development undertaken, and targeted indicators of productivity, profitability, environmental sustainability, and social value.

The framework will continue to be refined during 2022/23 as it is implemented across SRA's diverse research portfolio, industry services, and plant breeding program.

Solutions to industry challenges

In 2021/22, SRA and partners invested in 50* technology solutions to respond to industry challenges including transformative technologies, optimising disease, weed and pest management, sustainability, new breeding technology, and collaboration and innovation design. Solutions differ in their readiness for delivery to industry. Using the Crop Research Technology Readiness Levels (TRLs), solutions are reported by their maturity status along SRA's innovation pipeline below.

Further detail on solutions are provided in the following section related to Research Missions (starting page 26).

**Excludes other solutions that are not classified using TRLs such as SRA's capability building programs, some extension and delivery package solutions, district plan activities, and plant breeding.*

TRL		LEVEL
Early Stage	1	Industry challenge/opportunity identified
	2	Innovative solution or approach formulated
	3	Proof of concept experiments to demonstrate potential added value by the innovation
Mid Stage	4	Field trials or technology performance experiments to validate the innovation
	5	Field-scale production trials or on-site technology assessments to validate commercial use
Late Stage	6	Full-scale production initiated of innovation
	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: Amended version of Crop Research Technology Readiness Levels (United States Department of Agriculture, 2018, Crop Research Technology Readiness Level (TRL), National Institute of Food and Agriculture).

SOLUTIONS

Early Stage 13

Highlights

RNAi biopesticide to manage sugarcane root feeding pests

Production of triglycerides in sugarcane

Mid Stage 23

Highlights

Decision support tool 'Harvest Mate' to improve yield and cane quality while enabling growers and contractors to better manage harvesting costs

Genomic selection to increase breeding efficiency for SRA's Plant Breeding Program

Late Stage 14

Highlights

Life cycle assessment to benchmark and drive improvements in the industry's environmental and social impact

Milling training package covering topics such as juice clarification, mud filter operation, and evaporator operation and cleaning

Measuring impact

In 2021/22, SRA and partners engaged three independent consultants to undertake 12 benefit-cost analyses of eight RD&A investments and two programs. These analyses quantified the monetary benefit of solutions delivered to the sugarcane industry as well as detailing impacts such as improvements to productivity and avoided losses from disease.

For every $1 invested by SRA, the Queensland Department of Agriculture and Fisheries, the Commonwealth Department of Agriculture, Fisheries and Forestry, and other partners, $5.50 of economic value was created.

$5.50 to $1

The aggregated benefit-cost ratio for these analyses is $5.50 to $1

$396.9M

$396.9M estimated net present value

Soil health solutions have included in-field training delivered as part of the SIX EASY STEPS® program.

Impact assessment highlights

Optimising productivity, variety recommendations and mill operations through analysis of mill data

This solution produced valuable knowledge by analysing mill data in North Queensland to identify farm production units performing below potential and the factors associated with this. SRA will use this knowledge to support growers and milling companies to increase farm productivity and profitability by recommending more appropriate selection of varieties to match field conditions, address impediments to farm productivity and nutrient management planning.

The assessment found outcomes translated to a **net present value of $9.75 million and benefit-cost ratio of $8.60 to $1** from investment by SRA and the Queensland Department of Agriculture and Fisheries.

The analysis did not quantify the value of impacts delivered to milling companies and as a result it was not possible to report the benefit distribution across the industry's value chain. SRA will address this limitation by working with future providers and research partners to improve data collection by projects so that this is possible in future analyses.

2016/032 project analysis by Marsden Jacobs Associates

Energy solutions including analysis of the costs and benefits of using renewable energy to support irrigation of Australian sugarcane farms, and a related training and extension package for growers

This solution supported growers to reduce their energy costs associated with pumping water and to lower carbon emissions by incorporating solar photovoltaic (PV) technologies into irrigation sites. Research findings suggest PV technologies are more cost-effective than other energy options including diesel generators, batteries, and turbines, and support environmental outcomes including reduced carbon emissions.

The assessment concluded that because there is limited data available on the adoption of PV technologies by sugarcane growers, these outcomes could not be translated easily to net present value.

The benefit-cost ratio to date from this investment is $1 to $1.

The analysis identified that with sufficient adoption, it is likely that a high benefit value will be demonstrated from this investment in the future.

2017/011 Productivity improvements through energy innovation in the Australian sugar industry, analysis by Marsden Jacobs Associates

Diversification/new revenue solutions by converting sugar and cotton waste to animal feed and probiotics

Still in mid-stage development, this solution will generate new revenue streams in the bio and green economies when it is delivered to industry.

The assessment found outcomes translated to a **net present value of $17.3 million and benefit-cost ratio of $10.30 to $1** from investment by SRA and partners.

In relation to spillover benefits, **53 per cent of the present value benefit is attributed to animal feed and probiotics from sugarcane waste** and 47 per cent to the production of 5-chloromethyl furfural (CMF) for animal feed from cotton gin trash.

The analysis did not value animal feed for poultry or employment and community spillover benefits. SRA will address this limitation by working with providers to collect relevant data for future assessments.

2019/902 Biorefineries for Profit - Phase 2, analysis by AgTrans Research

Soil health solutions including in-field methods to measure indicators, and a training and extension package

This solution supported growers to increase profitability from improved farming practices, reduce nutrient runoff and greenhouse gases, and spillover benefits to other RD&A projects through knowledge transfer.

The assessment found outcomes translated to **a net present value to industry of $14.9 million and a benefit-cost ratio of $5.20 to $1.**

The analysis did not value environmental impacts. SRA will address this limitation by using the soon-to-be-completed life cycle assessment tool *(2020/001 Environmental Risk Assessment & Life Cycle Assessment of the Raw Sugar Manufacturing)* to measure these impacts in future assessments.

2017/005 Measuring soil health, setting benchmarks, and driving practice change in the sugar industry, analysis by Marsden Jacobs Associates

Queensland Government

Australian Government
Department of Agriculture, Fisheries and Forestry

SRA acknowledges the funding contribution of the Queensland Department of Agriculture and Fisheries towards these research activities, and for funding for the Biorefineries for Profit program by the Australian Government Department of Agriculture, Fisheries and Forestry through the Rural R&D for Profit Program

Strategic Pillar 2: Outcome measures

Cross-sectoral/multidisciplinary collaborations

Target – 50% of portfolio involves cross-sectoral/ multidisciplinary research by 2024

Result – 65% of SRA's research portfolio involved cross-sectoral collaborations in 2021/22.

Note: multidisciplinary is defined as a project including two or more researchers with distinct disciplines e.g. soil health and engineering. Cross-sectoral includes projects with solutions designed for two or more distinct industries.

Source: SRA

Impact of research programs on industry profitability, productivity, and sustainability

Target – Return on investment higher than previous years. In 2021/22, SRA and partners completed benefit-cost analyses on 11 research investments for a benefit-cost return of $1.99 to $1. In 2019/20, analyses on 20 investments delivered a return of $2.90 to $1.

Result – Benefit-cost analyses completed on 10 research investments and programs indicates that for every $1 invested by SRA and partners, the return on investment was at least $5.50 delivered in economic activity. Examples of impacts delivered include avoided production losses from disease, increased profitability from sugarcane waste, improved productivity from soil health management practices, and optimal varieties for farm conditions.

Source: SRA

Annual uplifts in awareness of, and engagement in, R&D activities measured by survey results and response rates

Target – Uplift on 2021/22 result

Result – Baseline awareness of R&D activities measured by awareness of research investment planning and research portfolio.

Reported awareness of investment planning

	Research Investment Planning
Growers	71%
Millers	96%

Reported awareness of research portfolio (average across R&D programs)

	Research Portfolio
Growers	85%
Millers	81%

Note: Average % of respondents who report a result that indicates awareness (i.e. "I've heard of it but don't know the details", "I have some understanding of it", "I'm very familiar with it").

Engagement with R&D activities measured by participation in R&D projects

Project teams reported 284 engagements with growers and millers related to research and development for projects active in 2021/22.

Note: Result may include engagements that occurred in 2020/21. Chief Investigators did not differentiate engagements by year in some projects. Result based on 17 projects.

Source: SRA

Partner and investor satisfaction

Target – More than 80% of partners and investors satisfied with SRA

Result – Results from a survey completed in June 2022 suggest 80% of SRA's research investors and delivery partners, and industry representative partner organisations, are satisfied with SRA's performance investing the R&D levy for expected outcomes for grower and millers.

Source: SRA

Increase in the total factor productivity growth in sugarcane agriculture over time relative to a baseline year

Target – Increase on baseline year

Result – This outcome will be measured when new data becomes available and reported on at a later date during SRA's *Strategic Plan 2021-2026* period. As an interim measure, and guide only, results from the 2020/21 Agricultural Census by the Australian Bureau of Statistics (released July 2022) suggests annual sugarcane production has increased by 3% since 2019/20 to a total of 31.1 million tonnes.

Source: SRA

Economic contribution of the sugarcane industry to the regional, state and national economy

Target – Increase on current economic contribution

Result – This outcome will be measured when new data becomes available and reported on at a later date during SRA's *Strategic Plan 2021-2026* period. As an interim measure, and guide only, in 2020/21, the milling sector contributed $2.4 billion in direct spending to the Australian economy; cane farming supports nearly $1.1 billion in economic activity; and the total sugar supply chain supports approximately $4 billion in economic activity.

Sources: Economic Impact of Queensland Sugar Manufacturing Industry 2020/21 by Lawrence Consulting in February 2022; and the Economic Contribution of the Sugarcane Industry to Queensland and its Regional Communities (CANEGROWERS funded) 2019.

Satisfaction with research investment

Partners and investors

SRA undertook a survey of research investors and delivery partners in June 2022. The survey was a key recommendation of a review completed in 2021
into the SRA and Queensland Department of Agriculture and Fisheries (DAF) Funding Agreement.

Organisations invited to participate included the Department of Agriculture, Fisheries and Forestry (DAFF), DAF, research and development corporations, research delivery organisations, and industry representative organisations.

Among the findings:

- >90 per cent of respondents indicated SRA staff are active in engaging in industry matters and events
- 80 per cent were satisfied that SRA invests levies to achieve the expected outcomes
- 77 per cent of respondents indicated SRA is easy to work with
- 77 per cent indicated SRA collaborates well with other organisations and industry stakeholders
- 85 per cent were familiar with the strategic plan
- 62 per cent were familiar with the research investment approach
- Areas identified for improvement included program manager visibility, more regular visits to research organisations and timely responses to co-investors for extensions and variations.

Growers and millers

SRA also surveyed a sample of growers and millers, seeking feedback about SRA's operations. Highlights and insights for the research portfolio were:

- 85 per cent of growers surveyed are aware of SRA's research portfolio
- 87 per cent of growers indicated they were satisfied with the research portfolio
- 81 per cent of milling representatives are aware of SRA's research portfolio
- 91 per cent of milling representatives surveyed indicated they were satisfied with the research portfolio.

Pursuing constitutional change

SRA's strategic plan includes an action to pursue constitutional change for improved industry input into the research program strategy and project selection.

Consultation has begun on proposed changes relating to a restructure of the Research Funding Panel and engagement on these proposals will continue into 2023.

At the upcoming AGM, Members will be asked to vote on constitutional changes involving minor administrative corrections and enhancements resulting from recent changes to the Corporations Act regarding electronic meetings and procedures.

RESEARCH MISSION 1
PROFITABLE AND PRODUCTIVE

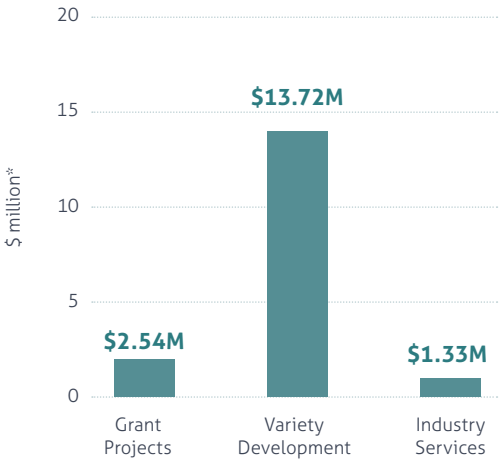
Continuous improvement in farming and milling profitability

The objective of this research mission is to increase the ongoing competitiveness of the Australian sugarcane industry by supporting year-on-year improvements to productivity, in aggregate and at a regional level.

Support development of industry varieties that are high yielding and pest and disease resistant.

INVESTMENT

SRA invested $17.59M towards 16 projects, plus industry services, and plant breeding under Research Mission 1. Expenditure includes grants and translation research, industry services (see Strategic Pillar 3 on page 54), and plant breeding (see Strategic Pillar 4 on page 72).



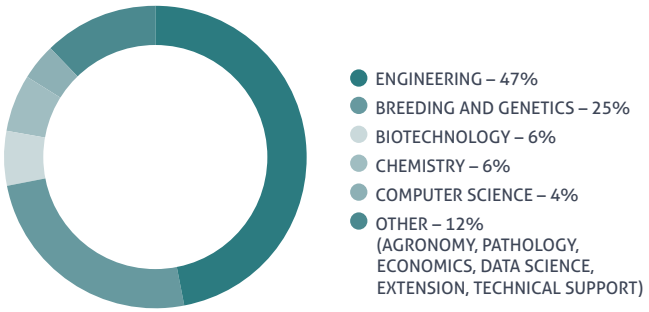
**Numbers are rounded*

DIVERSITY OF PARTNERS

SRA collaborated with **15** partners, including five organisations not contracted*, on investments under Research Mission 1. This included one co-investment partner.

RESEARCH CAPACITY

SRA engaged 55 investigators, including one investigator not contracted*, from a diverse range of disciplines.



4 research positions supported including post-doctoral research and PhDs.

SOLUTIONS

**Organisations and individuals identified as not contracted have been engaged by the research partner and are additional to resourcing identified in the contract.*

Investment	Solution Description	TRL 1 - 2	TRL 3 - 4	TRL 5 - 6	TRL 7 - 9	Completion & Status
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 to increase breeding efficiency for SRA's Plant Breeding Program	●	●	●		Method available Spring 2023
2017/007 Investigations to mitigate the effects of juice degradation in factory evaporators on sugar recovery and quality, corrosion and effluent organic loading	Milling operational method to reduce evaporator corrosion and maintenance costs for milling companies	●	●	●		Method available
2017/102 Microwave Sensors for Sugarcane Sugar Analysis	Low-cost instrument to measure commercial cane sugar content in juice for milling companies	●	●			Product available for pre-commercial development
2018/005 Genetic analysis and marker delivery for sugarcane breeding	Molecular markers to increase breeding efficiency for SRA's Plant Breeding Program	●	●	●		Method available Summer 2022
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	●	●			Method available for pre-commercial development Summer 2022
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	●	●	●		Method available Spring 2022
2019/004 Harvester losses assessment by real-time Machine Vision Systems	Harvesting product to detect and reduce harvesting losses for growers and contractors	●	●			Product available for pre-commercial development
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	●	●	●		Method available Winter 2023
2019/007 Eliminating roll arcing	Method to coat roll surfaces to reduce degradation and maintenance costs for milling companies	●	●	●		Method available Spring 2022
2019/102 Genetic solutions for determining fibre quality traits in sugarcane.	Molecular markers and method to measure fibre quality to increase breeding efficiency for SRA's Plant Breeding Program	●	●			Method available for pre-commercial development Winter 2023
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 while enabling growers and contractors to better manage harvesting costs	●	●	●		Product available Winter 2023
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	●	●	●		Method available Sumner 2022
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	●	●			Method available
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 companies	●	●			Method available
2021/203 On-line measurement of the physical properties of each cane consignment at the factory	System to measure billet length and extraneous matter entering mill for milling companies	●	●			Method available
2021/204 Evaluate the operational performance and industry application for the final evaporator design at Victoria Mill	Validation of the latest SRI-designed evaporator when installed at the #5 position	●	●	●		Method available

TRL		LEVEL
Early Stage	1	Industry challenge/opportunity identified
	2	Innovative solution or approach formulated
	3	Proof of concept experiments to demonstrate potential added value by the innovation
Mid Stage	4	Field trials or technology performance experiments to validate the innovation
	5	Field-scale production trials or on-site technology assessments to validate commercial use
Late Stage	6	Full-scale production initiated of innovation
	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: Amended version of Crop Research Technology Readiness Levels (United States Department of Agriculture, 2018, Crop Research Technology Readiness Level (TRL), National Institute of Food and Agriculture).

Highlights: Research Mission 1

- New evidence by The University of Queensland validates efficacy of a genomic selection method for more profitable varieties in SRA's Variety Development Program.
- Adoption of economically improved harvesting practice via the decision support tool is estimated to increase productivity by 4.9 tonnes per hectare and grower profitability by $116 per hectare.
- Final development of high throughput, low-cost single nucleotide polymorphism (SNP) markers has been completed by CSIRO to enable faster selection of varieties in SRA's Variety Development Program. SNP is a type of a genetic marker used in the determination of disease or trait and its association with the genetic variations.
- The *Australian Sugarcane Farm Business Survey* released in December 2021 found average farm cash income was $190,800 per farm in 2020/21, 91% higher than the average in 2013/14.
- For every $1 invested by SRA and DAF in optimising productivity, variety recommendations and mill operations through analysis of mill data (2016/032), at least $8.60 of economic value was created for the sugarcane industry.
- Novel design and operational method for mill evaporators to minimise sugar degradation, corrosion and maintenance costs was developed and delivered to industry by Queensland University of Technology. Adoption of new technology is estimated to generate 80 cents in additional revenue per tonne of cane crushed.

Success Measures

1. Increased throughput - tonnes per hectare

Latest estimates suggest throughput, as measured by tonnes of cane per hectare (TCH), is slightly trending upward. Average TCH increased by 0.4% from 2020/21 with an average 88.1 TCH recorded for 2021.

This brings the rolling five-year average for 2017-2021 to 86.6 TCH indicating a small decrease from 88.8 TCH in the 2016-2020 period.

Source: QCANESelect®

2. Increased sugar per hectare

Latest estimates suggest tonnes of sugar per hectare (TSH) is trending downward slightly. Average TSH decreased by 0.02% from 2020/21 with an average 11.9 TSH recorded for 2021.

This brings the rolling five-year average for 2017-2021 to 11.93 TSH indicating a small decrease from 12.1 TSH in the 2016-2020 period.

Source: QCANESelect®

3. Rate of adoption of productivity-enhancing technology

Latest estimates of adoption of production-enhancing technology suggest differing rates of adoption by management practice.

- 49% of growers in 2021 reported that they employed a harvesting contractor who used Harvesting Best Practice and cane monitoring technologies to reduce harvesting losses.
- 67% of growers reported use of precision steering on their farm equipment and 23% said they used yield mapping to manage their farming system.

Validating high throughput phenomics technologies for sugarcane clonal selection

CHALLENGE

High yielding optimally adopted cane varieties are crucial to increase industry profitability and maintain sustainability. However, in recent years, genetic gains have stagnated across most sugarcane breeding programs including in Australia.

The SRA breeding program uses a selection index that relies mainly on cane yield, and sugar and fibre content. One of the limitations of this is the ineffectiveness of selection in single row small plots in the early stages of breeding. This is because, besides genetic effects, significant inter-row competition and experimental errors can influence genotype ranking and result in low accuracy of clonal selections in the early stages of breeding.

SOLUTION

This project builds on previous SRA-funded research which has introduced unmanned aerial vehicles (UAVs) - or drones - and aims to improve accuracy of early-stage clonal selection by validating high throughput phenomics* technologies and developing an optimal selection index.

The drone, with a range of cameras with machine learning algorithms, acts as a third eye for the breeder, when data is inputted to statistical models to make informed selection decisions.

**Phenomics is observing the plant's physical and physiological traits, rather than genetics which relates to the genetic make-up of plants.*

- A large number of growers now report adoption of best practices with respect to disease management.
    - 86% and 74% of growers regularly take smut and Pachymetra resistance ratings, respectively, into consideration when choosing new varieties to plant.

Source: Sugarcane Farm Business Survey completed by ABARES in 2021

4. Number and value of elite varieties

The number of experimental clones with higher industry profitability than the reference variety Q208$^{\Phi}$, increased to 208 in the 2020 trial series.

Lead indications are 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*. See more on page 74.

Source: SRA Plant Breeding Program

5. Reduce development cycle-times for the variety program

Data on cycle-times will be reported in future annual reports.

6. Value of milling process innovation

Investment by SRA and partners in recent milling process innovation is estimated to have produced a net present value of $10.7 million to industry and a positive return on investment of $2.60 to $1. This is based on five benefit-cost analyses of past milling investments including four by independent economists and one internal assessment between 2019 and 2021.

Source: Benefit-cost analyses funded by SRA and investment partners

IMPACT

SRA has set an ambitious target to achieve two per cent genetic gain in its sugarcane varieties year-on-year by 2026. The use of drones and machine learning algorithms provides data on how different clones and varieties are performing.

*Project no: 2019/002
Principal R&D provider: Sugar Research Australia
Chief Investigator: Dr Sijesh Natarajan

On-line measurement of the physical properties of each cane consignment at the factory

CHALLENGE

High levels of extraneous matter (EM) and inconsistent billet length increase the cost of milling operations and decrease the value of the cane crop, affecting both miller and grower returns.

EM and billet dimensions of sugarcane supplied to mills, have not commonly been measured (except on an intermittent basis at Tully Mill). This means the industry is not able to actively manage these parameters or determine their true financial impact.

SOLUTION

By having an on-line measurement of the physical properties of the cane supply, the data can be used with harvesting information (such as field loss estimates), and transport information (such as bin weights), to determine optimum harvesting conditions and maximise cane value in each district.

Using computer vision and machine learning methodologies, the project is developing algorithms to measure extraneous matter and billet dimensions for cane consignments arriving at the mill.

The algorithms will be provided to mills, along with specifications for video equipment, required to support measurement.

IMPACT

Millers and growers can take a cooperative approach to manage harvesting, transport and milling operations to maximise the value of the cane crop for the district.

The financial benefits to a cane district from implementing the technology will vary depending on circumstances. However, for a district crushing green cane, the net benefit is estimated at $3-4 per tonne of cane.

*Project no: 2021/203
Principal R&D provider: Tully Sugar
Chief Investigator: John Edwards

RESEARCH MISSION 2
RESILIENT AND ENDURING

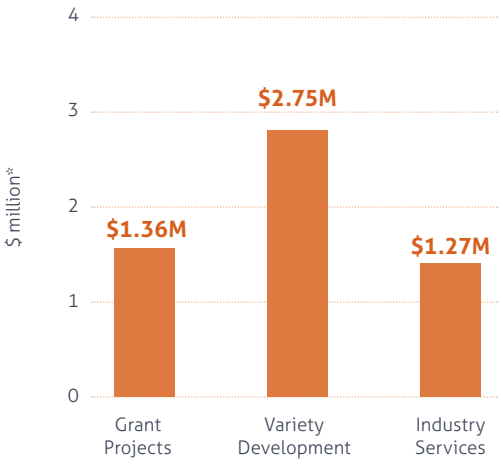
Position the industry to stay ahead of climate, environmental and biosecurity threats

The objective of this research mission is to minimise and control the risk to production resulting from pests, diseases, weeds and climate/ environmental threats.

Exotic moth borer larvae – SRA research preparing for the arrival of the exotic pest.

INVESTMENT

In 2021/22, SRA invested $5.38M in Research Mission 2 towards 13 projects including grants and translational research, industry services (see Strategic Pillar 3 on page 54), and plant breeding (see Strategic Pillar 4 on page 72).



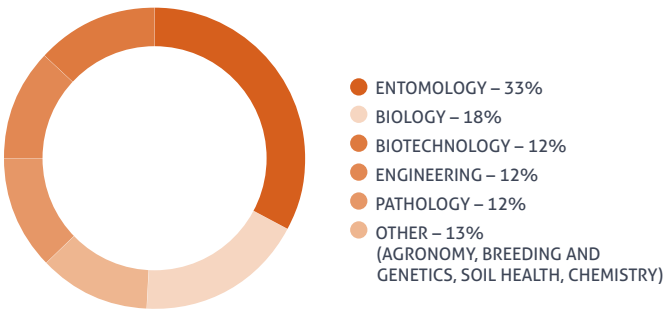
**Numbers are rounded*

DIVERSITY OF PARTNERS

SRA collaborated with **45** partners, including one organisation not contracted*, on investments under Research Mission 2.

RESEARCH CAPACITY

SRA engaged 40 investigators from a diverse range of disciplines.



2 research positions supported including post-doctoral research and PhDs.

SOLUTIONS

**Organisations and individuals identified as not contracted have been engaged by the research partner and are additional to resourcing identified in the contract.*

Investment	Solution Description	TRL 1 - 2	TRL 3 - 4	TRL 5 - 6	TRL 7 - 9	Completion & Status
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	Seasonal forecast tools to predict unseasonable and extreme weather events for sugarcane growers and other agricultural industries	●	●	●	●	Full suite of products available Autumn 2023
2017/902 Improving plant pest management through cross-industry deployment of smart sensors, diagnostics and forecasting (iMAP Pests)	Surveillance network and tools to monitor pests for sugarcane growers and other agricultural industries (SRA is a delivery provider)	●	●	●		Products available for pre-commercial development
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	●	●	●		Method available for pre-commercial development Autumn 2023
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	●	●			Methods available for pre-commercial development
2020/002 Developing an integrated device for on-farm detection of sugarcane diseases	On-farm diagnostic tool to detect and monitor leaf scald and ratoon stunting diseases	●	●			Product available for pre-commercial development Autumn 2023
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	●	●	●		Method available Autumn 2025
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	●	●			Methods available for pre-commercial development Autumn 2024
2020/008 Transformational crop protection – Innovative RNAi biopesticides for management of sugarcane root feeding pests	RNAi biopesticide to manage sugarcane root feeding pests	●				Product available for experimental testing Autumn 2024
2020/402 Early detection of sugarcane diseases via hyperspectral imaging and deep learning	Hyperspectral imaging and deep learning technology to detect smut and mosaic diseases in sugarcane	●	●			Method available for experimental testing
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	●	●	●		Product available
2021/401 Risk assessment for the newly discovered parasitic nematode Pratylenchus parazeae in the Australian sugarcane industry	Assessment of the pathogenicity (ability to cause disease) of a newly discovered parasitic nematode and resistance within germplasm	●				Method available for experimental testing Autumn 2023
2021/402 Towards more sustainable pest control strategies through a metagenomic survey of viral entomopathogens in canegrub populations	Integrated pest management using novel insect-specific viruses to biologically manage canegrubs	●				Method available for experimental testing Winter 2023
2022/604 Plant Biosecurity Research Initiative Phase 2	National diagnostics for early detection and rapid response to pests affecting plant industries	●	●	●		Methods and products available Winter 2023

TRL		LEVEL
Early Stage	1	Industry challenge/opportunity identified
	2	Innovative solution or approach formulated
	3	Proof of concept experiments to demonstrate potential added value by the innovation
Mid Stage	4	Field trials or technology performance experiments to validate the innovation
	5	Field-scale production trials or on-site technology assessments to validate commercial use
Late Stage	6	Full-scale production initiated of innovation
	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: Amended version of Crop Research Technology Readiness Levels (United States Department of Agriculture, 2018, Crop Research Technology Readiness Level (TRL), National Institute of Food and Agriculture).

Highlights: Research Mission 2

- Novel technology by Griffith University reduces time to detect sugarcane smut from 15 weeks to 8 weeks and sugarcane mosaic virus from 8 to 2 weeks following inoculation.
- Commencement of industry-first RNAi biopesticide by The University of Queensland to manage sugarcane root feeding pests such as canegrubs.
- Bureau of Meteorology releases seasonal forecast tools that provide information about the likelihood of unseasonal and extreme rainfall and temperature events in sugarcane growing districts.
- Pre-commercial development of assay that detects ratoon stunting disease in sugarcane entering the mill is completed and available for deployment.
- SRA research team received a 2022 Australian Society of Sugar Cane Technologists Award for an innovation having a direct and immediate benefit to the sugarcane industry.
- Alternative insecticides to manage canegrubs demonstrated to be effective in the laboratory ahead of the next phase involving farm trials.

Success Measures

1. Improved resistance ratings of newly released varieties

SRA's varieties continue to have improved resistance to disease. For example, the weighted average smut resistance of the national crop has decreased substantially from 6.4 in 2006 to 3.48 in 2021 based on a nine-point scale, where 1 indicates a high degree of resistance and 9 indicates no resistance. The level of smut resistance is expected to continue to improve as intermediate varieties such as Q200$^{(f)}$ and Q208$^{(f)}$ are replaced by new resistant varieties.

The number of clones susceptible to smut in Final Assessment Trials was reduced to less than 5% for the first time in the most recent trial series results.

The frequency of Pachymetra susceptible clones was reduced to less than 3%, and the level of resistant clones increased to 69%. (See more on page 73.)

Source: SRA

2. Estimated avoided costs to production of potential, new and emerging pests, diseases and weeds

Pests

Investment by SRA and the Queensland Department of Agriculture and Fisheries in developing solutions to manage a moth borer incursion (2018/010) is estimated will result in significant avoided losses. Impacts from incursions in sugarcane production in other countries results in losses of greater than 40% of tonnes per hectare.

Source: 2018/010 Moth borers – how are we going to manage them when they arrive?

Moth Borers – how are we going to manage them when they arrive?

CHALLENGE

Moth borers represent one of Australia's most significant biosecurity threats. They are common throughout South-East Asia, including near neighbours Indonesia and Papua New Guinea. In these areas moth borers are not successfully controlled and they represent a significant productivity constraint (up to 40 per cent yield reduction).

An incursion of moth borers is considered a likely risk by the Australian Department of Agriculture, Forestry and Fisheries.

SOLUTION

SRA researchers are collaborating with international colleagues on strategies to rapidly identify and manage these exotic pests in the event of an incursion in Australia.

Project trials involving SRA, the Indonesian Sugar Research Institute and Ramu Agri Industries are testing control measures in Indonesia and PNG. Although COVID-19 travel restrictions delayed some of the work, the project is progressing well, and the final season of the trials is in progress.

Field studies are testing a range of systemic insecticides, applied at either planting/fill-in stage and in ratoons, for the management of a range of moth borer species, including the stem borers *Chilo sacchariphagus, C. auricilius and Sesamia grisescens and the top shoot borer Scirpophaga excerptalis.*

IMPACT

The impact of this project is to safeguard the productivity and profitability of the sugarcane industry from avoided production losses in the event of a moth borer incursion.

*Project no: 2018/010
Principal R&D provider: Sugar Research Australia
Chief Investigator: Dr Kevin Powell

SRA acknowledges the funding contribution of the Queensland Department of Agriculture and Fisheries towards this research activity.

Queensland Government

Disease

Without adequate management, estimates suggest ratoon stunting disease could impact approximately 8-22% of the cane area planted and this prevalence rate could increase to an alarming 39-48% by 2040 without solutions.

Source: SRA biosecurity benefit-cost analysis completed by ACIL Allen in 2021

Weeds

Estimates suggest on average 3% of sugarcane production is lost to weed competition. To manage this, sugarcane growers spend an average of $100 per hectare on herbicides (a significant proportion of the average costs of crop chemicals used).

SRA is a key delivery partner in the project *2020/804 Reducing herbicide usage on sugarcane farms in reef catchment areas with precise robotic weed control* managed by James Cook University that aims to reduce the volume of knockdown herbicide used to manage weeds by 80% in comparison to traditional broadcast spraying.

Sources: McLeod, R. (2018) Annual Costs of Weeds in Australia. eSYS Development Pty Limited. Published by the Centre for Invasive Species Solutions, Canberra, Australia; Farm Business Survey 2020-21 by ABARES; 2020/804 Reducing herbicide usage on sugarcane farms in reef catchment areas with precise robotic weed control.

3. Estimated avoided production loss from advanced crop protection and management technologies

SRA's investment in advanced crop protection and management technologies has contributed to substantial avoided sugarcane production losses from endemic disease and exotic threats. Investment in protection and management of ratoon stunting disease and Fiji leaf gall to the industry is estimated to be valued at $67.5 million and $73.7 million (2021/22-dollar terms) in avoided production losses, respectively. Investment in prevention measures against exotic threats such as moth borers, leaf scald, and white leaf phytoplasma, is estimated to be valued at $147.6 million (2021/22-dollar terms) in avoided production losses.

Source: SRA biosecurity benefit-cost analysis completed by ACIL Allen in 2021

4. Farmer understanding of climate-related threats and opportunities (survey)

Current estimates suggest the proportion of sugarcane growers reporting climate-related threats such as drought, rainfall, and weather extremes, to farm productivity is increasing. In 2016, 22% of growers reported climate as one of three perceived constraints to improving their farm productivity. In 2021, this has increased to 33%, or one third, of growers who now report the same threat. This result indicates more growers now understand the threat of climate-related threats.

Sources: SRA Grower Survey 2016 undertaken by Down to Earth Research and Sugarcane Farm Business Survey and completed by ABARES in 2021

Beyond imidacloprid - chemical and biorational alternatives for managing canegrubs

CHALLENGE

Canegrubs, representing 20 different species, are among the most significant economic pests of sugarcane in Australia and are spread across all canegrowing regions.

They cause damage by feeding on and damaging the sugarcane root system. If not managed, more than 50 per cent of the cane growing area is potentially at risk and canegrubs would threaten sustainability of the industry through lost production and reduced profitability.

Currently a single active ingredient, imidacloprid, has been used effectively for canegrub management. If this product were no longer available or restricted in use, due to legislative withdrawal on environmental grounds, or insecticide resistance develops, there would be significant consequences for the industry.

SOLUTION

Previous SRA research, along with overseas research, has laid the foundations for potential commercial and novel products in development.

This project will run for four years as SRA undertakes screening activities with pesticides that show promise for controlling canegrubs with the objective to provide enough data for companies to register alternative canegrub control products.

IMPACT

Any products registered as a result of the project will be available to growers to manage canegrubs with similar or improved efficacy to imidacloprid and with reduced environmental impacts.

This project is also improving grower confidence that there are other potential chemical options for managing canegrubs and water quality considerations.

*Project no: 2020/004
Principal R&D provider: Sugar Research Australia
Chief Investigator: Dr Kevin Powell

SRA acknowledges the funding contribution of the Queensland Department of Agriculture and Fisheries towards this research activity.

Queensland Government

RESEARCH MISSION 3
DIVERSIFIED AND ADAPTABLE

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

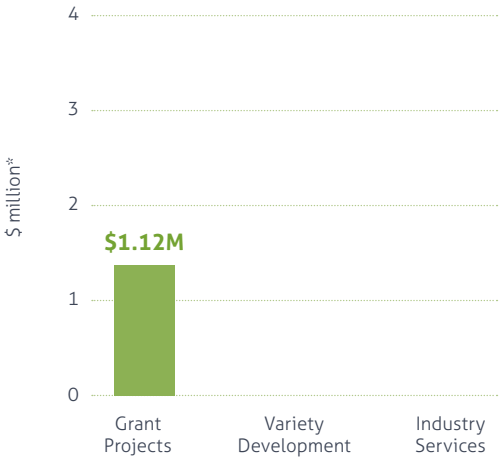
The objective of this mission is to deliver research, development and analysis to support the industry in:

- **increasing revenue by leveraging existing resources, brand reputation and supply chain**
- **remaining profitable during sugar price fluctuations**
- **finding opportunities to monetise biomass potential.**

Research is examining new revenue streams and uses for Australian sugarcane.

INVESTMENT

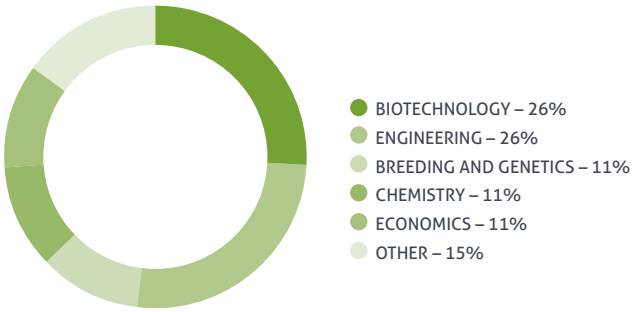
SRA invested $1.12M in six projects under Research Mission 3.



**Numbers are rounded*

RESEARCH CAPACITY

SRA engaged 26 investigators from a diverse range of disciplines.



DIVERSITY OF PARTNERS

SRA collaborated with **20** partners, including four organisations not contracted*, on investments under Research Mission 3. This included seven co-investment partners.

1 research scholarship supported at the Master level.

SOLUTIONS

Early Stage 4 **Mid Stage 1** **Late Stage 0**

**Organisations and individuals identified as not contracted have been engaged by the research partner and are additional to resourcing identified in the contract.*

Investment	Solution Description	TRL 1 - 2	TRL 3 - 4	TRL 5 - 6	TRL 7 - 9	Completion & Status
Biorefineries for Profit Program (2015/902, 2019/902 and 20220/011)	Production of livestock feed and probiotics from sugarcane waste	●	●	●		Products available for ongoing pre-commercial development
2020/010 Sugar Industry Consultation and Roadmap Development	Industry roadmap that outlines actions and measures for better business as usual and value adding, to unlock opportunities presented by the bioeconomy	NA	NA	NA	NA	Resource available
2020/013 Oil Canes Part 1: Technical readiness and regulatory assessment	Production of triglycerides from sugarcane	●				Product not technically feasible and will not be developed
2020/014 Feasibility studies to assess the economic viability of producing hydrogen from bagasse and compostable bioplastic from sugarcane juice	Feasibility assessment for production of hydrogen and compostable bioplastics from sugarcane waste	●				Product requires ongoing preliminary evaluation
2020/101 Engineering bacterial enzyme secretion for cellulose utilisation	Production of biochemicals from sugarcane waste using microbial technology	●	●			Method available for experimental testing Autumn 2023
2021/004 Project BGreen	Feasibility assessment for production of glycols and hydrogen from sugarcane juice and waste	●				Method requires ongoing preliminary evaluation

TRL		LEVEL
Early Stage	1	Industry challenge/opportunity identified
	2	Innovative solution or approach formulated
	3	Proof of concept experiments to demonstrate potential added value by the innovation
Mid Stage	4	Field trials or technology performance experiments to validate the innovation
	5	Field-scale production trials or on-site technology assessments to validate commercial use
Late Stage	6	Full-scale production initiated of innovation
	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: Amended version of Crop Research Technology Readiness Levels (United States Department of Agriculture, 2018, Crop Research Technology Readiness Level (TRL), National Institute of Food and Agriculture).

Sugar industry diversification opportunities investigation

CHALLENGE

The increasing momentum of the global bio-based economy represents an opportunity for the Australian sugar industry to break away from the current dependence on the world sugar price.

SOLUTION

Following an ongoing market and technology watch exercise, this project has investigated the potential application of two sugarcane biorefinery opportunities: the production of hydrogen from sugarcane bagasse and the production of compostable bioplastics, such as polyhydroxyalkanoate (PHA) and Polylactic acid (PLA) cane juice.

The project studied the production, technology and logistics needs as well as intellectual property required, and identified any investment barriers to their application.

IMPACT

The project has been completed and concluded that the future for green hydrogen made from sugarcane is promising, however it will require significant investment.

The study also concluded that production of compostable bioplastics from cane juice was technically viable but uncertainty surrounds the current economics.

PLA is increasingly being used for simple one-use applications such as coffee cups, stirrers, and cutlery. With changing world views concerning the use of fossil fuels, the removal of single use plastics and the move to more environmentally friendly sources of plastics world-wide, the long-term outlook for bioplastics seems likely to improve.

Project no: 2020/014
Principal R&D provider: PROCOM Consultants Pty Ltd
Chief Investigator: Abe du Pont

SRA acknowledges the funding contribution of the Queensland Department of Agriculture and Fisheries towards this research activity.

Queensland Government

Highlights: Research Mission 3

- For every $1 invested by SRA and partners in Biorefineries for Profit Phase 2, it is expected there will be at least $10.30 of economic value created, with an expected total net present value of $17.29 million.
- Industry roadmap was developed in partnership with industry representative organisations and funding partners: *Sugar Plus – Fuelling the Future of Food, Energy and Fabrication.*
- Research findings demonstrated the feasibility of biofuel technologies and associated market opportunities and economic value to the sugarcane industry.
- Study identified it is cost-competitive to produce green hydrogen from sugarcane compared with alternatives but would require a large investment.
- Polylactic Acid (PLA) is identified as the most realistic focus for bioplastics derived from sugarcane. While costs are higher than conventional plastics, the longer-term outlook is expected to improve as government policy shifts and more single-use plastics are removed from sale.
- Proof of concept was demonstrated for an engineered microorganism that breaks down toxins in sugarcane by-products paving the way for high-value products.

Success Measures

1. Percentage of farms and mills generating revenue from alternative products

Data is required to report on this success measure. Progress will be reported in future annual reports.

2. Industry contribution to gross domestic product

The sugarcane industry makes a significant contribution to Australia's gross domestic product (GDP). The total sugar supply chain is estimated to contribute $4 billion in economic activity. Differentiated by production and manufacturing, estimates suggest farming contributes $1.1 billion and $2.4 billion is delivered by milling/sugar manufacturing.

Sources: The Economic Contribution of the Sugarcane Industry to Queensland and its Regional Communities completed 2019 and Economic Impact of Queensland Sugar Manufacturing Industry 2020/21 by Lawrence Consulting completed 2022.

In relation to jobs, estimates suggest sugarcane farming contributes to direct and indirect employment of 9,834 full-time positions in Queensland and approximately 3,747 direct full-time employees in milling-related roles.

Sources: The Economic Contribution of the Sugarcane Industry to Queensland and its Regional Communities completed 2019 and Economic Impact of Queensland Sugar Manufacturing Industry 2020/21 by Lawrence Consulting completed 2022.

3. Satisfaction with R&D support for the industry's diversification and trade and market access opportunities

Industry satisfaction with SRA's research and development to support diversification and trade and market access opportunities is moderately positive but not as strong as with other areas of the portfolio such as biosecurity and nutrient management. In 2022, milling companies rated the importance of research related to trade and market access on average 6.3 on a scale of 0-10 where 0 represents not important at all and 10 represents extremely important.

There is limited evidence of industry satisfaction with diversification. In the same survey a small number of milling companies requested that SRA increase investment in diversification.

For example, one respondent suggested:
"...By-products - alternate products made from juice - like sustainable aviation fuel, bio-plastics, that sort of stuff. Something that is related to renewable energy-co-generation."

Further support was offered by growers with one member suggesting *"...I'd like to see ethanol production by-product expansion".*

Source: SRA Grower and Miller Surveys completed by Intuitive Solutions in 2022

Industry Roadmap

2020/010 Sugarcane Industry Situational Analysis: Industry consultation and roadmap development

In September 2021, the sugarcane industry embarked on an important initiative to develop a sugarcane industry roadmap to develop a clear path for the Australian industry to secure and grow its value for future generations. SRA was the project sponsor and collaborated with multiple partners.

The roadmap was developed through a nine-month engagement process across the Australian sugar industry supply chain and was formally released at the Developing Northern Australia Conference in early July 2022.

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, positioning the industry at the centre of Australian bioeconomy superhighway.

The roadmap describes the sugarcane plant as one of the most resilient and adaptable plants on Earth – the perfect ingredient to help fuel the future of Food, Energy and Fabrication:

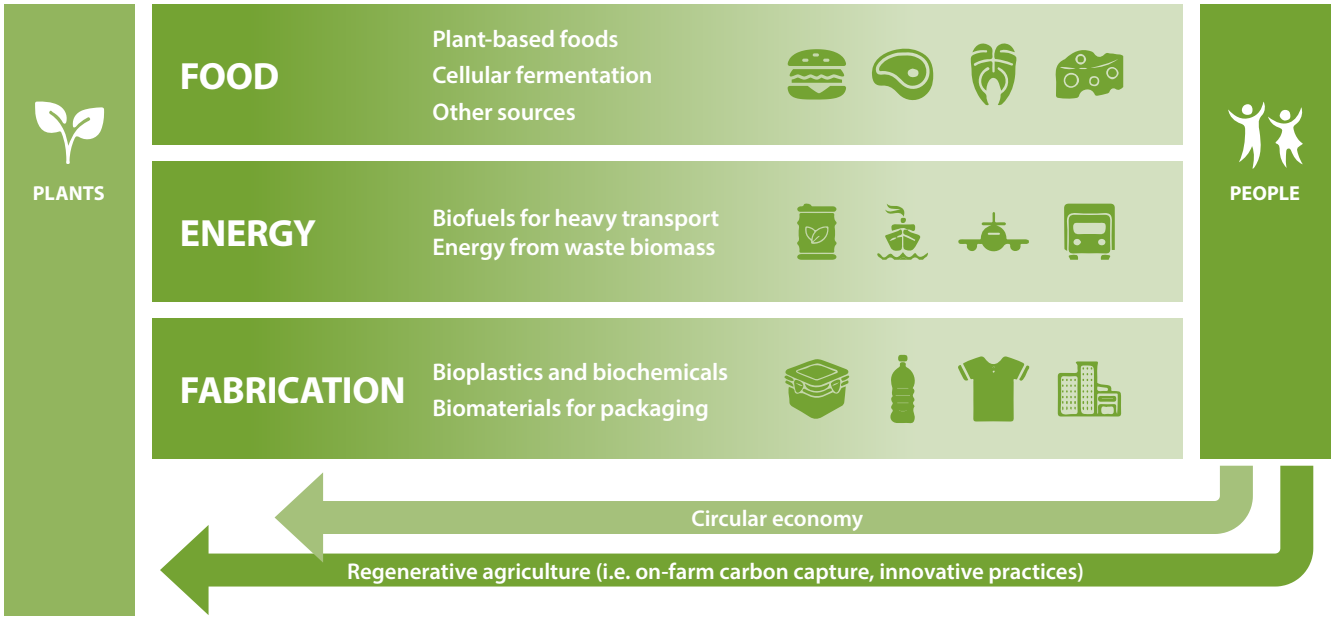
- **Food** is where it all starts – raw sugar will continue to play an important role in feeding the world over the long term, and sugar is an important feedstock for the new generation of animal-free foods
- **Energy** that builds on current co-generated power and ethanol production to provide the next 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.

The roadmap identifies opportunities for a substantially larger industry, noting that a growing bioeconomy will enable Australia to become increasingly self-sufficient, and improve economic resilience and national security.

To realise the opportunities that have been identified, actions are identified in the near, medium, and longer term, to strengthen and build the industry while charting a path to a bigger, bolder future. Actions are needed at a range of levels:

- individual farm level
- local community level
- regional coordination and/or the support of a mill
- national leadership and coordination.

Industry representative organisations have committed to form a series of working groups to drive implementation.



Positioning Australia as a bioeconomy powerhouse.

Industry representative organisations and government agencies partnered in this initiative. Industry organisations acknowledge and thank Pottinger for its role in engaging across the industry supply chain and developing the industry roadmap on our behalf.

The CRCNA is funded as part of the Australian Government's Cooperative Research Centre Program (CRC-P)

RESEARCH MISSION 4
WEALTH GENERATING THROUGH LAND STEWARDSHIP

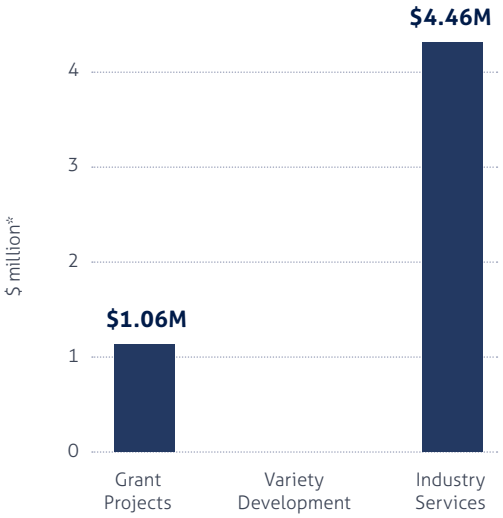
Position the Australian sugarcane industry as leaders in profitability, environmental sustainability and resource-use efficiency

The objective of this research mission is to recognise that the future success of the industry depends on the sustainable use of inputs including land, water, carbon and energy, and aims to ensure that the Australian sugarcane industry's practices sustain the natural environment and are profitable for growers and millers.

Improving irrigation efficiency.

INVESTMENT

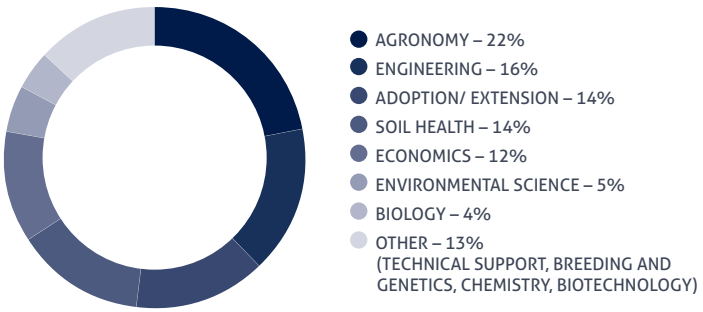
SRA invested $5.52M in 20 projects under Research Mission 4.



**Numbers are rounded*

RESEARCH CAPACITY

SRA engaged 26 investigators from a diverse range of disciplines.



DIVERSITY OF PARTNERS

SRA collaborated with **61** partners, including 12 organisations not contracted*, on investments in Research Mission 4. This included twenty co-investment partners.

4 research positions supported including PhDs.

SOLUTIONS

**Organisations and individuals identified as not contracted have been engaged by the research partner and are additional to resourcing identified in the contract.*

Investment	Solution Description	TRL 1 - 2	TRL 3 - 4	TRL 5 - 6	TRL 7 - 9	Completion & Status
2017/004 SIX EASY STEPS® - continuing perspectives in time and space	Technology transfer mechanisms for the SIX EASY STEPS nutrient management program	●	●	●	●	Training and extension package available
2018/003 Implementation of root system diagnostics to deliver a field-based measure for root health	In-field DNA diagnostic assay for root health	●	●			Product available for pre-commercial development
2018/101 New Approaches to Quantifying Nitrogen Fluxes in Enhanced Efficiency Fertilisers in Australian Sugarcane Soils	Enhanced efficiency fertilisers optimised for soil differences and environmental conditions	●	●			Product available for pre-commercial development
2018/102 Characterising Nitrogen Use Efficiency in Sugarcane	Method to identify clones with high nitrogen use efficiency for SRA's Plant Breeding Program	●	●			Method available for pre-commercial development
2019/803 Nutrient Management Planning in the Russell Mulgrave	Training and extension package delivering improved nutrient management solutions to growers in the Far North Queensland district (SRA is a delivery provider)	NA	NA	NA	NA	Training and extension package delivered
2019/901 Smarter Irrigation for Profit Phase 2	Training and extension package delivering decision support solutions for irrigation to growers in the Burdekin and Southern districts	●	●	●		Training and extension package delivered; products available for pre-commercial development
2019/903 Australian sugar industry soil health benchmarking in the Central region of Qld - increasing profit and transforming soil health practices through competitive industry research, extension and adoption	Extension package delivering soil and root health solutions to growers in the Central district	NA	NA	NA	NA	Training and extension package delivered
2019/904 Australian sugarcane industry soil health benchmarking in the Wet Tropics region of Queensland – Increasing profit and transforming soil health practices through competitive industry research, extension and adoption	Extension package delivering soil and root health solutions to growers in the Far North Queensland district	NA	NA	NA	NA	Training and extension package delivered
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	●	●	●	●	Method available Autumn 2023
2020/017 A common approach to sector level GHG accounting for Australian agriculture	Standard protocol for greenhouse gas emissions accounting for agricultural industries	●	●	●	●	Method available February 2023
2020/802 Mackay Whitsunday Cane to Creek	Extension package delivering improved nutrient and pesticide management solutions for growers and enhanced water quality in the Central district (SRA is a delivery provider)	NA	NA	NA	NA	Training and extension package to be completed Spring 2023
2020/803 On ground testing and modelling of the effectiveness of enhanced Efficiency Fertilisers in the Wet Tropics catchments of the Great Barrier Reef	Decision support tool for Enhanced Efficiency Fertilisers (SRA is a delivery provider)	●	●	●	●	Product available
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 (SRA is a delivery provider)	●	●	●		Product available for pre-commercial assessment Spring 2022
2020/805 Burdekin Irrigation Project: Increasing Industry Productivity and Profitability Through Transformational, Whole of Systems Sugarcane Approaches that Deliver Water Quality Benefits	Extension package delivering improved irrigation efficiency and water quality solutions for growers in the Burdekin district (SRA is a delivery provider)	NA	NA	NA	NA	Training and extension package to be completed Winter 2024
2021/007 Investigating Potential for Sugar Industry Participation in Green Markets	Industry feasibility assessment of green market opportunities for growers	●	●	●	●	Resource available Summer 2022

Investment	Solution Description	TRL 1 - 2	TRL 3 - 4	TRL 5 - 6	TRL 7 - 9	Completion & Status
2021/008 Australian Sugarcane Sustainability Framework	Sugarcane Industry Sustainability Framework to drive improvements in the industry's environmental impact	●	●	●	●	Method available Winter 2024
2021/101 Optimising mill mud and ash applications for soil improvement and carbon sequestration	Method to apply mill mud and ash to maximise yield and soil health, and measure soil carbon sequestration	●				Method available Autumn 2025
2021/102 Systems biology for sustainable agriculture: evaluation of plant growth-promoting bacteria to produce high-performing biofertilisers	Biofertiliser with optimal soil nutrient utilisation to increase yields	●				Product available for pre-commercial assessment Autumn 2025
2021/804 Mobilising the Murray	Extension package delivering whole-of-farm solutions for productivity constraints experienced by growers in the North Queensland district (SRA is a delivery provider)	NA	NA	NA	NA	Training and extension package to be completed Winter 2023
2021/805 Soil specific management for sugarcane production in the Wet Tropics	Extension package delivering capacity building solutions to growers in Far North Queensland (SRA is a delivery provider)	NA	NA	NA	NA	Training and extension package to be completed Autumn 2024

TRL		LEVEL
Early Stage	1	Industry challenge/opportunity identified
	2	Innovative solution or approach formulated
	3	Proof of concept experiments to demonstrate potential added value by the innovation
Mid Stage	4	Field trials or technology performance experiments to validate the innovation
	5	Field-scale production trials or on-site technology assessments to validate commercial use
Late Stage	6	Full-scale production initiated of innovation
	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: Amended version of Crop Research Technology Readiness Levels (United States Department of Agriculture, 2018, Crop Research Technology Readiness Level (TRL), National Institute of Food and Agriculture).

Support of cane farmer trials of enhanced efficiency fertilisers in the catchments of the Great Barrier Reef

CHALLENGE

There is growing pressure from community and government for farmers located within the Great Barrier Reef catchments to reduce nutrient losses. Enhanced efficiency fertilisers (EEFs) provide an opportunity to improve nitrogen (N) fertiliser uptake by sugarcane crops by better matching N supply with crop demand.

SOLUTION

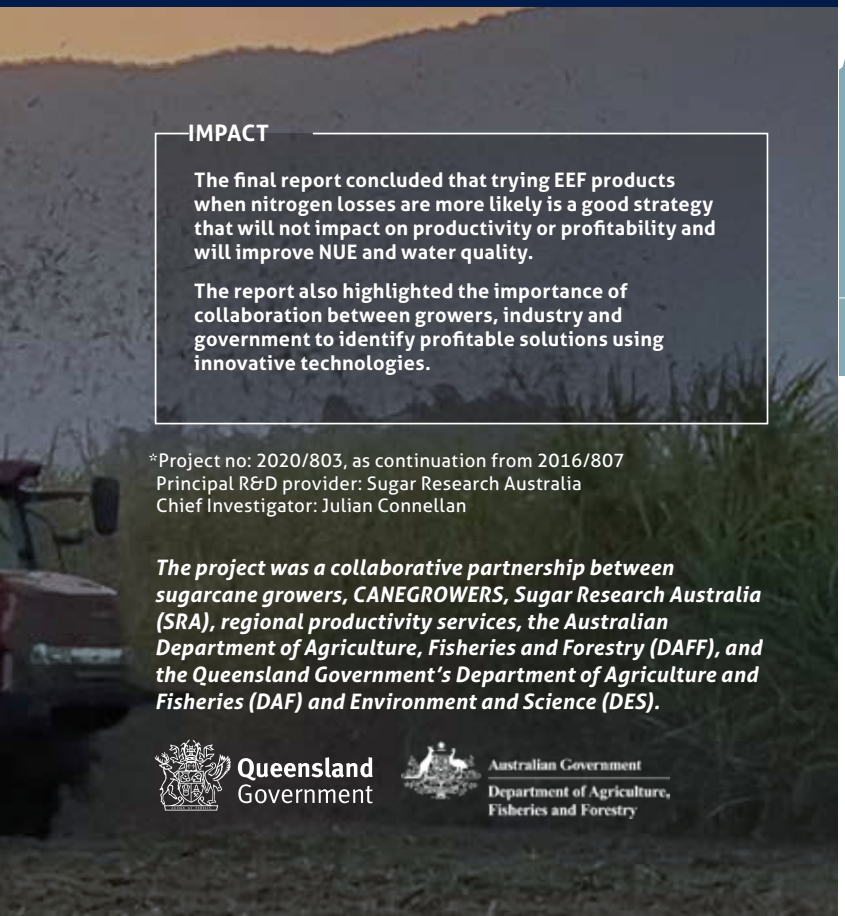
The EEF60 project was designed to test EEFs on 60 sugarcane farms, located between Bundaberg and Mossman, over three harvests.

It evaluated the production and profitability implications for commercial farms from applying EEFs in place of conventional urea fertiliser by measuring cane and sugar yield, commercial cane sugar (CCS), grower profitability, nitrogen use efficiency (NUE), crop N content, fertiliser uptake efficiency, post-harvest soil N and water quality (N leaching and runoff).

The large number of trial sites and consistency in trial design enabled the collection and analysis of a wealth of data which determined what types, blends and rates of EEF perform better, where they get the optimal results – such as soil types, rainfall conditions and regions – and the best time for application.

Highlights: Research Mission 4

- Smarter Irrigation for Profit Phase II demonstrated 25% reduction in water usage from automation and optimisation technologies applied on sugarcane irrigation systems.
- More than 480 growers participated in SRA supported land stewardship programs through Mackay Whitsunday Cane to Creek, Russell-Mulgrave Complete Nutrient Management Planning, Mobilising the Murray, and the Burdekin Irrigation Project.
- Total land attributed to management practice changes (land stewardship) = 54,874 hectares.
- Total estimated dissolved inorganic nitrogen (DIN) reduction of 88 tonnes as a result of land stewardship programs managed by SRA. (Projects: Mackay Whitsunday Cane to Creek, Russell-Mulgrave Complete Nutrient Management Planning, Mobilising the Murray, and Burdekin Irrigation Project).
- For every $1 invested by SRA and DAF in developing a Soil Health Extension Toolkit and delivering related extension activities, it is expected there will be at least $4.20 of economic value created. This work is expected to produce a net present value of $14.89 million. (*2017/005 Measuring soil health, setting benchmarks and driving practice change in the sugar industry*).
- Proof of concept research commenced to develop a novel biofertiliser to address declining crop yields and soil health.



IMPACT

The final report concluded that trying EEF products when nitrogen losses are more likely is a good strategy that will not impact on productivity or profitability and will improve NUE and water quality.

The report also highlighted the importance of collaboration between growers, industry and government to identify profitable solutions using innovative technologies.

*Project no: 2020/803, as continuation from 2016/807
Principal R&D provider: Sugar Research Australia
Chief Investigator: Julian Connellan

The project was a collaborative partnership between sugarcane growers, CANEGROWERS, Sugar Research Australia (SRA), regional productivity services, the Australian Department of Agriculture, Fisheries and Forestry (DAFF), and the Queensland Government's Department of Agriculture and Fisheries (DAF) and Environment and Science (DES).

Queensland Government

Australian Government
Department of Agriculture, Fisheries and Forestry

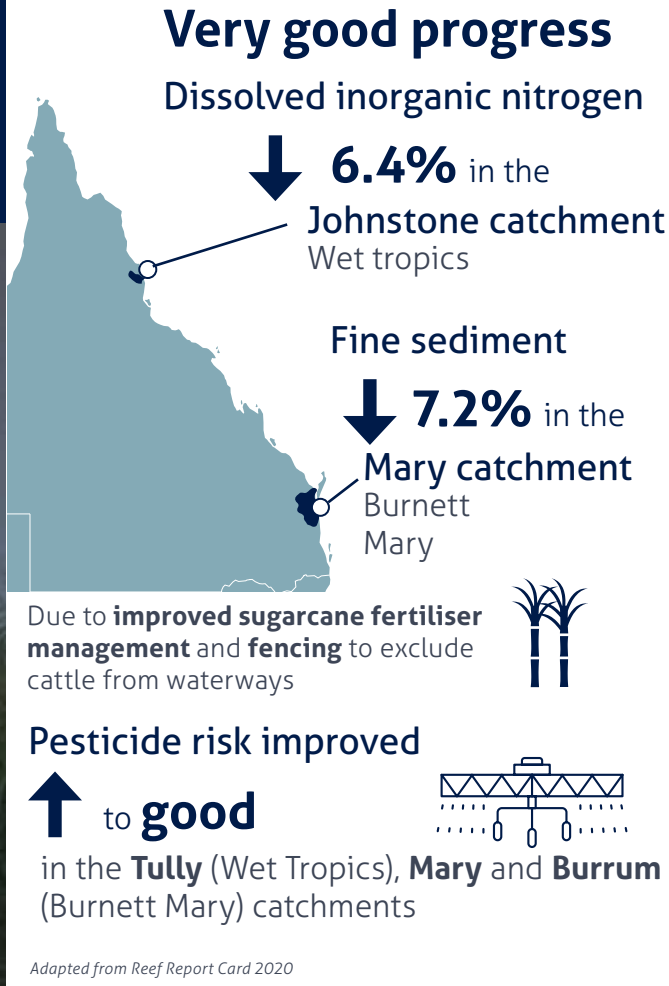
Success Measures

1. Positive progress in environmental credentials measured in industry benchmarking

The sugarcane industry is making positive progress towards key environmental measures. In relation to water quality, the 2020 Reef Report Card (released during 2022) reported moderate progress towards the dissolved inorganic nitrogen target across Great Barrier Reef catchments in 2019/20 with an annual reduction of 2.2%. The Johnstone catchment (Wet Tropics region) had the greatest annual reduction (6.4%). Reductions were identified as being mostly due to improved nitrogen fertiliser management and mill mud application in the sugarcane industry.

Sugarcane farming area devoted to environmental purposes is relatively high in comparison to other industries. In 2022, on average 7% of farm area was devoted to environmental purposes/natural ecosystems that is not used for farming. Across the districts, farms in the Far North Queensland (12%) and Central (9%) districts recorded the greatest areas for environmental purposes

Sources: Reef Report Card 2020 and SRA Grower Survey 2022



Adapted from Reef Report Card 2020

2. Positive external perceptions of sugar industry activities and efforts (government and public views)

Building on the *Community Trust in Rural Industries* (CTRI) research insights, a focal study of 1000 community members was conducted to better understand specific trust drivers for the sugar industry. An online survey of community members located across the sugarcane growing regions of northern Queensland, revealed the power of different trust drivers.

The key drivers of trust in the sugar industry are environmental responsibility, sustainability, rural identity, distributional fairness (i.e. benefits from the sugar industry are shared amongst communities) and the belief that sugar has a place in a balanced diet.

Notable insights include:

- 41% of the community believe the sugar industry responsibly manages the land and natural resources in a sustainable manner, a lower result than most horticultural industries
- 64% of the community believe sugarcane production is a sustainable industry in Australia.

Source : Community Trust in Rural Industries Sugar Fact Sheet 2022

The Mobilising the Murray Reef Trust VII (MRT7) project

CHALLENGE

In recent years the sugarcane industry has seen substantial investment from programs that have specifically targeted nutrient management and practices.

The Mobilising the Murray Reef Trust VII (MRT7) project takes a broader view and asks the farmer what issues, from their perspective, can be identified and addressed, and then goes a step further by offering financial incentives and expert advice to help the grower address those constraints.

3. Industry participation in green markets

SRA's investment *2021/007 Investigating Potential for Sugar Industry Participation in Green Markets* will explore participation in green markets. Progress against this measure will be reported in SRA's Annual Report 2022/23.

4. Industry uptake of, and satisfaction with, compliance and decision tools.

Current estimates of uptake and satisfaction with compliance and decision tools suggests there is generally a moderate familiarity and use by sugarcane growers, and encouragingly, most are satisfied with these.

In relation to decision support tools, more than 2000 farm businesses, approximately 62% of the industry, and associated with 332,000 hectares, have been benchmarked using the industry's Smartcane BMP program.

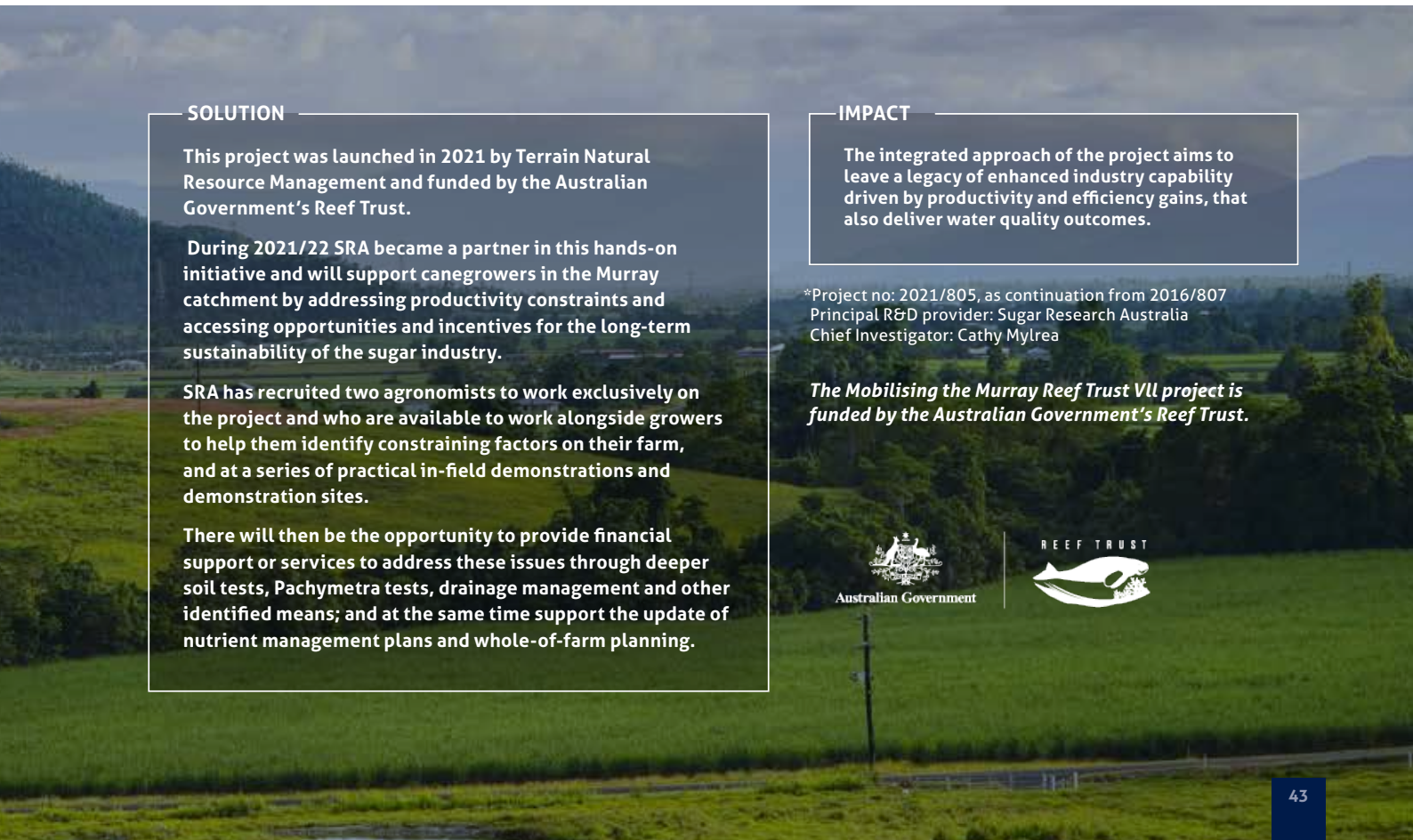
More than 700 farm businesses have been accredited by the program to date.

Source: Smartcane BMP (smartcane.com.au)

Approximately 75% of growers and 58% of millers are familiar with QCANESelect® - an online resource to optimise sugarcane production by supporting variety selection according to farm conditions and management. Satisfaction for this tool is high, with growers and millers both rating an average satisfaction score of 7.3 on a scale of 0-10, where 0 indicates extremely dissatisfied and 10, extremely satisfied.

Moreover, 56% and 52% of growers and millers respectively report familiarity with SRA's Soil Health Toolbox, another decision support tool to assist growers to optimise sugarcane production. There is more moderate satisfaction with this tool with growers and millers reporting average satisfaction ratings of 7.1 and 6.4 on the same scale.

Source: Source: SRA Grower, Miller & Investor/ Partner Surveys 2022



SOLUTION

This project was launched in 2021 by Terrain Natural Resource Management and funded by the Australian Government's Reef Trust.

During 2021/22 SRA became a partner in this hands-on initiative and will support canegrowers in the Murray catchment by addressing productivity constraints and accessing opportunities and incentives for the long-term sustainability of the sugar industry.

SRA has recruited two agronomists to work exclusively on the project and who are available to work alongside growers to help them identify constraining factors on their farm, and at a series of practical in-field demonstrations and demonstration sites.

There will then be the opportunity to provide financial support or services to address these issues through deeper soil tests, Pachymetra tests, drainage management and other identified means; and at the same time support the update of nutrient management plans and whole-of-farm planning.

IMPACT

The integrated approach of the project aims to leave a legacy of enhanced industry capability driven by productivity and efficiency gains, that also deliver water quality outcomes.

*Project no: 2021/805, as continuation from 2016/807
Principal R&D provider: Sugar Research Australia
Chief Investigator: Cathy Mylrea

The Mobilising the Murray Reef Trust VII project is funded by the Australian Government's Reef Trust.

Australian Government | REEF TRUST

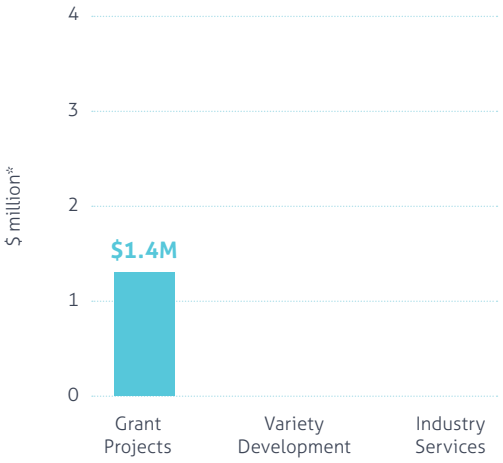
RESEARCH MISSION 5
SKILLED FOR THE FUTURE

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

Supporting industry advisors and building capability.

INVESTMENT

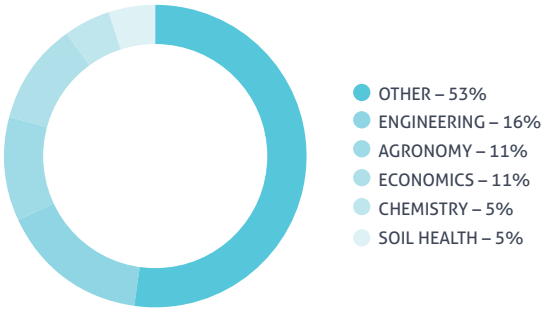
SRA invested $1.4M in six grant projects and capability building programs under Research Mission 5.



*Numbers are rounded

RESEARCH CAPACITY

SRA engaged 23 investigators from a diverse range of disciplines.



DIVERSITY OF PARTNERS

SRA collaborated with **21** partners, on Research Mission 5. This included 14 co-investment partners.

11 research positions supported, including post-doctoral research and undergraduate degrees.

SOLUTIONS

Early Stage 1 **Mid Stage 0** **Late Stage 2**

*2018/015 Sugar Milling R&D Capability Program not reported

Investment	Solution Description	TRL 1 - 2	TRL 3 - 4	TRL 5 - 6	TRL 7 - 9	Completion & Status
2022/603 EU-PEF Australian Participation in the European Union Product Environmental Footprint Technical Advisory Board	Recommendations to the European Union's Product Environment Footprinting methodology to appropriately quantify the environmental credentials of sugarcane and other agricultural industries to maintain current trade and market access.	NA	NA	NA	NA	Method available Summer 2022
2021/003 Scoping studies for an integrative digital platform for sustainable sugarcane crop management (CaneMAPPS)	CaneMAPPS geospatial decision support tool to select and implement suitable farming systems	●				Product now available for experimental testing
2020/009 Survey of Australian sugar cane farm business performance 2020-21 and 2021-22	Financial performance and farming systems used by sugarcane farms in 2021	NA	NA	NA	NA	Resource now available
2019/006 Australian Sugar Industry Training - Development of factory training modules - Phase 2	Milling training package covering topics including juice clarification, mud filter operation, and evaporator operation and cleaning	●	●	●	●	Training package now available
2018/015 Sugar Milling R & D Capability Building Program	Milling research capacity-building and succession-planning program for early career researchers	NA	NA	NA	NA	Capacity building program to be completed by Spring 2023
2007/003 The Community Trust in Rural Industries Program	Community attitudes and trust towards the sugarcane and other rural industries and best practices to build and maintain trust	●	●	●	●	Resource now available

TRL		LEVEL
Early Stage	1	**Industry challenge/opportunity identified**
	2	**Innovative solution or approach formulated**
	3	**Proof of concept experiments to demonstrate potential added value by the innovation**
Mid Stage	4	**Field trials or technology performance experiments to validate the innovation**
	5	**Field-scale production trials or on-site technology assessments to validate commercial use**
Late Stage	6	**Full-scale production initiated of innovation**
	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: Amended version of Crop Research Technology Readiness Levels (United States Department of Agriculture, 2018, Crop Research Technology Readiness Level (TRL), National Institute of Food and Agriculture).

SRA team members Danielle Skocaj, Terry Granshaw and Phil Patane attended the global digital farm demonstration site tour to explore opportunities for the sugarcane industry.

Highlights: Research Mission 5

- SRA's research investments supported more than 38 full-time jobs in the research community.
- SRA participated in nine cross-sectoral research and development corporation projects.
- SRA supported 18 scholarships across all Research Missions including five post-doctoral fellowships, eight PhDs, one Masters, and four undergraduate positions in areas including engineering, entomology, biotechnology, genetics, and chemistry.
- 49 publications related to SRA-funded projects were reported by investigators. This includes published and submitted for publishing papers to traditional journals, conferences, and thesis dissertations.
- Development commenced on industry-first digital platform to enable geospatial mapping and analysis to assist growers to select farming management practices to increase productivity, profitability and sustainability.
- Projects funded and managed by SRA included teams comprised of 26% female investigators and 73% male investigators. Note: 1% unknown gender.

Success Measures

1. The number and diversity of industry and research partners involved in establishing SRA's R&D goals and strategies

There were 43 industry and research partners representing 15 organisations including milling companies, farm businesses, universities, agricultural technology organisations, and government, and 17 SRA researchers, district managers and other staff involved in research investment planning during 2022.

Source: SRA

2. Number of capability building programs, and participation rates for capability programs, including diversity of participation

SRA invested in three important capability building programs. The first of these includes the jointly funded *2018/005 Sugar Milling R&D Capability Building Program* by SRA, Queensland University of Technology, and Sugar Research Institute (SRI). This program will support seven post-doctoral researchers in milling related research and development. In 2021/22, the program supported three researchers.

ABARES Sugarcane Farm Business Survey

In 2021, SRA once again partnered with the Queensland Department of Agriculture and Fisheries (DAF), to jointly engage the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) to design and conduct a survey of sugarcane growing businesses.

ABARES is the science and economics research division of the Commonwealth Department of Agriculture, Fisheries and Forestry. It provides professionally independent, world-class research, analysis and advice for government and private sector decision-makers on significant issues affecting Australia's agriculture, fisheries and forestry industries.

The sugarcane farm business survey and the related report *Financial performance of sugarcane farms 2020-21 to 2021-22*, collects important information about farming costs and production to identify historical trends for sugarcane growing businesses. The survey also identifies common farming systems used across farming regions to provide growers with insights about production and costs.

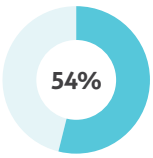
The survey found sugarcane farm cash income was 91 per cent higher in 2021 compared to the previous survey in 2013/14. While a number of smaller, less profitable farms exited the industry, the remaining farms got larger and also increased their cane yields.

The survey generated a wealth of data and other evidence to support the ongoing development of the industry.

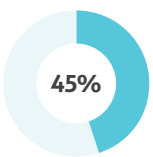
In the previous survey cycle, 62 per cent of sugarcane farms produced less than 8000 tonnes of sugarcane. By 2020/21, that proportion had declined to 49 per cent of farms.

From a productivity perspective, the two standout areas of focus identified for the next five years ahead were higher yielding varieties and improved soil health. Of the surveyed farms, 54 per cent identified improved varieties as an area of focus, while 45 per cent said they would focus on improving soil health.

Cane varieties were identified as a constraint across all regions. In the Herbert, almost every farm indicated that 'production of higher yielding varieties' was a focus to improve productivity over the next five years, which likely reflects the availability of the new high-performing varieties SRA26$^{\Phi}$ and SRA28$^{\Phi}$.



54% of surveyed farms identified varieties as an area of focus



45% of farms said they would focus on improving soil health

However, one person changed positions early in the period. To date, the program has supported three males and one female researcher with expertise in chemical and mechanical engineering and innovation chemistry.

Secondly, SRA funded four bursaries and four scholarships for undergraduate students studying chemical and civil engineering in 2021/22. This investment was made to the Australian Sugar Industry Scholarships & Bursaries Program co-funded and managed by SRI.

Thirdly, SRA's *2019/006 Australian Sugar Industry Training - Development of factory training modules - Phase 2* by SRI. This investment recently delivered an online milling training course covering topics including juice clarification, mud filter operation, and evaporator operation and cleaning.

Source: SRA

3. Number of undergraduate places supported in industry critical areas such as agronomy

SRA funded eight undergraduate places including four scholarships and four bursaries in critical areas such as engineering in Australian universities. This investment was made to the SRI administered Australian Sugar Industry Scholarships & Bursaries Program.

Source: SRA

4. Number of PhD submissions relating to the sugar industry

There were three SRA funded PhDs submitted. It is expected another three PhDs will be submitted in 2022/23 followed by two more in 2024/25.

Source: SRA

Photo by Stephen Mudge.

Practices of the most profitable farms

Based on the survey results, the most profitable cane farms were more likely to:

- have completed the Smartcane BMP modules
- consider smut resistance ratings when choosing new varieties of cane
- have wider crop rows
- use the SIX EASY STEPS® program for nitrogen application rather than basing this on personal experience
- use precision ag technology such as variable rate-controlled options for fertiliser and chemical application, and electromagnetic (EM) and yield mapping data
- engage with harvesting contractors who have implemented Harvesting Best Practice and new technologies (cane loss and yield monitors) to reduce harvesting loss.

Sugarcane farming in 2020/21:

- Average farm cash income was about $190,800 per farm, 91% higher than the average in 2013/14.
- Average rate of return on capital (excluding capital appreciation) was higher in 2020/21 than in 2013/14. The survey results estimate a rate of return of 2.0% in 2020/21, compared with an average of 0.7% in 2013/14. This is comparable with other agriculture industries in 2020/21 such as broadacre cropping (2.9%), livestock (0.8%) and dairy (2.5%).
- Financial performance is projected to improve in 2021/22, with the average total cash receipts per farm projected to increase by 11% from $591,300 in 2020/21 to $656,400 per farm in 2021/22. This increase is due to a combination of factors such as projected higher yields, production and sugar prices.
- While better farm financial performance was recorded in all districts in 2020/21 than 2013/14, there were significant differences between districts. Farm cash income was highest in the Burdekin (averaging $300,000 per farm) and Bundaberg ($236,000 per farm) districts. Farms in New South Wales recorded the lowest average cash income in 2020/21, however, these farms also recorded the lowest ratio of costs to receipts on average.

Source: Financial Performance of Sugarcane Farms 2020-21 to 2021-22 by the Australian Bureau of Agricultural and Resource Economics and Sciences in December 2021

Queensland Government

SRA acknowledges the funding contribution of the Queensland Department of Agriculture and Fisheries towards this research activity.

Developing the next generation of researchers

SRA invests significantly in industry capability, recognising the future success of the sugar industry needs the right capability and skills into the future.

To encourage young scientists into the industry, SRA makes available a number of Sugar Industry Postgraduate Research Scholarships (SPRS) each year, which can be undertaken at Australian universities and institutions, for postgraduate research study.

The purpose of these scholarships is to enable qualified graduates to undertake Research Doctorate or Research Masters study and to facilitate research and training in areas of value to the Australian sugarcane industry.

Hannah with her soil cores from cane paddocks in North Queensland.

HANNAH GREEN

Born in Townsville, Hannah's family moved to Singleton NSW (cattle country), where agriculture studies would become an exciting part of Hannah's high school days.

Achieving an exceptional Australian Tertiary Admission Rank (ATAR) and the NSW Premier's Award for All-Round Excellence, Hannah elected to return to Townsville and attend James Cook University.

While studying for her Honours project, Hannah embraced the opportunity to work with Wilmar Sugar. She gained practical experience in the field, taking soil cores from irrigated cane fields, processing samples for laboratory analysis, and measuring soil physical properties.

Graduating with a Bachelor of Advanced Science, Hannah majored in Earth Science, Zoology and Ecology with a strong focus on advanced statistics and ecological modelling. Research was always going to be the next step.

Optimising mill mud and ash applications for soil improvement and carbon sequestration

CHALLENGE

Restricting future global warming to 1.5-2.0˚C requires a major reduction in global greenhouse gas emissions and a significant increase in carbon sequestration (IPCC, 2018).

Mill ash and mud have high potential to sequester carbon through enhanced weathering due to their liming effects. These products are known to be beneficial for crop growth. However, little is known about their effects on soil, including their liming and carbon sequestration abilities.

*Project no: 2021/101
Principal R&D provider: James Cook University
Chief Investigator: Hannah Green

SOLUTION

One outcome of this project will be a carbon sequestration methodology that is easily quantified, permanent and unlimited (given continued application of mill by-products).

Additional outcomes for the sugar industry include improved runoff water quality through increased nutrient use efficiency and increased crop productivity through improved nutrient supply.

IMPACT

Adoption of the carbon sequestration methodology will facilitate trade in carbon credits through the Emissions Reduction Fund; and increase market access by demonstrating the ability of the sugar industry to meet consumer expectations regarding environmental responsibility.

The sugar industry specifically will benefit as the carbon sequestration methodology will utilise industry by-products, ensuring ease of access for sugar growers. The value of these by-products outside of the industry will also increase.

Angela is pictured suited up to work in the UQ School of Earth and Environmental Sciences, Environmental Geochemistry Laboratory, Radiogenic Isotope Facility.

ANGELA O'KEEFFE

Angela O'Keeffe has had a lifelong fascination for the plant kingdom, fuelled through several botanical courses during her undergraduate Bachelor of Applied Science.

After graduating, she worked on medical research projects before landing what she called her dream job as a research technician at the Queensland Alliance for Agriculture and Food Innovation (QAAFI).

Now undertaking her PhD, her research includes comparing two cane varieties, with soft and hard fibre quality, with respect to anatomy (using microscopy and image analysis) and biochemical composition, looking for traits linked to fibre quality.

Genetic solutions for determining fibre quality traits in sugarcane

CHALLENGE

In recent years some new "soft cane" varieties have seen fibre quality measurements that sit outside the normal range. Ttheir "softness" has resulted in mill stoppages and revenue loss.

Fibre quality measurement is labour intensive and time consuming and is therefore done in the later stages of the sugarcane breeding program. A relatively simple, high-throughput screen for fibre quality could potentially be applied at an earlier stage to eliminate soft cane varieties earlier in the breeding program.

SOLUTION

This project is comparing a set of genotypes from two cane varieties, with soft and normal fibre quality, with respect to anatomy (using microscopy and image analysis) and biochemical composition, looking for traits linked to fibre quality.

IMPACT

Knowledge derived from this analysis will assist breeders in the early stages of the breeding program.

Ultimately millers will benefit from the reliable development of varieties with improved fibre quality and an increase in mill efficiency from a guaranteed supply of varieties with good milling properties.

*Project no: 2019/102
Principal R&D provider: CSIRO
Chief Investigator: Angela O'Keefe

Systems biology for sustainable agriculture: evaluation of plant growth-promoting bacteria to produce high-performing biofertilisers

CHALLENGE

Improved crop yields are a key target for farmers, but the overuse of chemical fertilisers to increase yields as much as possible, has negative impacts on soil health and future crop sustainability.

SOLUTION

The primary goal of this research is to produce a high-quality biofertiliser that will address the key industry issues of crop yields and soil health.

The bacterium that will be the focus of this project has been demonstrated to improve soil nutrient utilisation which can increase yields without applying excessive fertiliser, as well as reducing soil acidification when used in conjunction with a standard fertilisation regime.

A key part of the project is the use of mill mud from cane mills and other waste streams as part of the biofertiliser.

IMPACT

Introduction of nutrients along with the beneficial bacteria will provide a strong product that achieves high crop yields in a long-term, sustainable farming system.

The environmental benefits of this biofertiliser would include improved soil health, reduced waterway contamination, and reduced production of chemical fertilisers which contribute to greenhouse gas emissions.

IAN PETERSEN

Ian Petersen graduated from The University of Queensland in 2020 with a Bachelor of Chemical Engineering and Bioprocess Biotechnology.

He was considering a career in Chemical Engineering, until the Honours component of his dual degree involved working with a bacterium found in the roots of sugarcane. That sparked an interest in agriculture and specifically biofertilisers and now the course of his PhD.

*Project no: 2021/102
Principal R&D provider: The University of Queensland
Chief Investigator: Ian Petersen

Partnerships and Collaboration

SRA has partnerships and collaborations with a wide range of research and agricultural organisations including universities, research institutions, productivity services providers, niche consultants and scientific specialists. In 2021/22, 65 per cent of SRA's research portfolio involved cross-sectoral/multidisciplinary collaborations. Through these relationships, SRA is able to leverage valuable resources to deliver optimum outcomes for the Australian sugarcane industry.

Research delivery partners and collaborators

SRA has working research relationships with the following entities:

- AgEcon
- AgForce
- Agricultural Innovation Australia
- Agriculture Victoria
- AgriFutures
- AgriTech Solutions
- Alluvium Consulting
- Australian Cane Farmers Association
- Australian Eggs
- Australian Meat Processor Corporation
- Australian Museum Trust
- Australian Pork Ltd
- Australian Research Council
- Australian Sugar Milling Council
- Australian Cane Farmers Association
- Australian Wool Innovation
- AusVeg
- AutoWeed
- B3Co
- Bayer
- Bioproton Pty Ltd
- Bundaberg Sugar
- Bundaberg Sugar Services Ltd
- Burdekin Bowen Integrated Floodplain Management Advisory Committee
- Burdekin Productivity Services
- Burdekin Renewable Fuels
- Bureau of Meteorology
- CANEGROWERS
- Cesar Pty Ltd
- Climate Research Strategy for Primary Industries
- Cooperative Research Centre for Developing Northern Australia
- Cotton Research and Development Corporation
- CQUniversity
- CSIRO
- Council of Rural, Research and Development Corporations
- Dairy Australia
- Daleys Water Services
- Deakin University
- Department of Agriculture and Fisheries (Qld)
- Department of Agriculture and Food (WA)
- Department of Agriculture, Fisheries and Forestry (Aus)
- Department of Climate Change, Energy, the Environment and Water (Aus)
- Department of Economic Development, Jobs, Transport and Resources (Vic)
- Department of Environment and Science (Qld)
- Department of Industry, Tourism and Trade (NT)
- Department of Primary Industries and Regional Development (WA)
- Department of Primary Industries, Parks, Water and Environment (Tas)
- EnviroDNA
- Farmacist
- Fisheries Research and Development Corporation
- FMC Australia
- Forest and Wood Products Australia
- Grains Research & Development Corporation
- Great Barrier Reef Foundation
- Griffith University
- Gwydir Valley Irrigators Association
- Haldore Topsoe A/S
- Herbert Cane Productivity Services Limited
- Hort Innovation
- ICD Project Services
- Indonesian Sugar Research Institute
- Innisfail Babinda Cane Productivity Services
- Integrity Ag and Environment
- Isis Central Sugar Mill
- Isis Productivity Ltd
- James Cook University
- Lazuli Consulting
- LiveCorp
- Mackay Area Productivity Services
- Mackay Sugar Ltd
- Meat and Livestock Australia
- Mercurius Australia
- Monash University
- Mossman Agricultural Services
- National Farmers' Federation
- New South Wales Department of Primary Industries
- NQ Dry Tropics
- Nufarm
- Nursery and Garden Industry Australia
- OKR Pty Ltd
- Plane Creek Productivity Services Limited
- Plant and Food Research New Zealand
- Plant Health Australia
- Pottinger
- Procomm
- Queensland University of Technology
- Ramu Agri Industries
- Riverlea Australia
- Roth Rural
- Rothamsted Research
- S&L Peters Pty Ltd
- Seftons
- South Australian Research and Development Institute
- Southern Cross University

- Star Economics
- Sugar Research Institute
- Sugar Services Proserpine
- Sugar Terminals Ltd
- Sumitomo Shi FW Energia OY
- Suncorp
- Sunshine Sugar
- Tanglewood Consulting
- Tasmanian Institute of Agriculture
- The University of Queensland
- T.R.A.P. Services
- Tully Cane Productivity Services
- Tully Sugar Limited
- University of Melbourne
- University of Southern Queensland
- University of Sydney
- University of Tasmania
- Voconiq
- WH Heck and Sons
- Wilmar
- Wine Australia

SRA also collaborates with sugar related research institutes around the world.

Variety exchange agreements are in place with major sugarcane breeding countries such as Brazil, Guatemala, the United States of America, China, Japan, Sri Lanka, Mauritius, Vietnam and Reunion (via France).

SRA continues to negotiate with other countries to enhance the genetic material being used in the industry's plant breeding.

Cross-sectoral partnerships

SRA partners with other rural research and development corporations on common challenges to maximise the value derived from research and investment.

Our partnerships include work with the following organisations:

Agricultural Innovation Australia

SRA is a founding member of Agricultural Innovation Australia (AIA), a not-for-profit, public company established to facilitate joint investment and collaboration in cross-industry agricultural issues of national importance.

AIA identifies, develops and invests in strategies that address shared challenges and opportunities to deliver transformative outcomes that drive sustainability, productivity and profitability across Australian agriculture.

During the year, AIA released its inaugural strategic plan, outlining eight cross-sectoral priorities:

- climate
- biosecurity
- sustainability and regenerative agriculture
- supply chain traceability
- natural resource management
- energy
- waste and circular economy
- digital and data.

Council of Rural Research and Development Corporations

The Council of Rural RDCs represents all 15 rural RDCs as a collective.

During the reporting period, SRA's Chief Executive Officer Roslyn Baker served as an Executive Member for the Council.

grow[AG]

AgriFutures' grow[AG] is a collaborative effort by the Department of Agriculture, Fisheries and Forestry and Australia's 15 rural research and development corporations.

The online marketplace and platform work alongside other AgriFutures Australia projects to put Australia front-of-mind for agrifood research, development and extension, technology and innovation on a global scale.

It does this by showcasing Australian agrifood innovation research projects, organisations, innovation challenges, and research, investment and commercialisation opportunities online in one, easy to use location.

The platform makes research, development and extension (RD&E) outcomes transparent for growers and the community and positions Australia as a global agrifood innovation hub.

During 2021/22 SRA:

- had 36 research projects on grow[AG]
- received 2 enquiries via grow[AG]
- featured in 1 story on the platform.

grow[AG] has been embraced by the local and global agrifood communities with 58,000 website users from 170 countries over 2021/22. Since its launch, 63% of visitors have come from Australia with the remainder going to the platform from international markets including Singapore, United States of America, United Kingdom, New Zealand, China and India helping position Australia as a leader in agrifood innovation.

Cross-sectoral research initiatives

During 2021/22 SRA was involved in the following cross-sectoral research initiatives:

Research initiative	SRA identifier
Common approach to sector level GHG accounting	2020/017
Improving pest management	2017/902
Managing climate variability	2017/901
Boosting diagnostic capacity for plant production industries	2019/905
EU-PEF Aus participation	2022/603
Plant Biosecurity Research Initiative Phase 2	2022/604
Smarter Irrigation for Profit	2019/901
Biorefineries for Profit Phase 2	2019/902
Community Trust in Rural Industries	2007/003

Highlights from some of these initiatives are provided on the following pages.

Managing Climate Variability

Managing Climate Variability – Phase 5 (Forewarned is Forearmed - FWFA) is equipping farmers and agricultural value chains to proactively manage the impacts of extreme climate events.

Australian farmers and agribusinesses operate in one of the most variable climates of any country in the world, with extreme events and climate variability the largest drivers of fluctuations in annual agricultural production and income.

In the past 12 months, the project has provided five new Bureau of Meteorology forecast products for extreme events in the weeks to months ahead.

Areas of focus under FWFA are:

- identifying areas for improvement in the performance of seasonal climate forecasts
- development, trialling, and subsequent operationalisation of five new Bureau of Meteorology forecast products for extreme events in the weeks and months ahead
- development of risk management packages for extreme events for specific agricultural sectors, and for agriculture more generally
- communicating the progress of the project through a variety of media platforms. The main agricultural sectors of focus for the project are red meat, grains, dairy, sugar and wine grapes with support also for the cotton, pork and rice industries.

Funding partners include the Australian Department of Agriculture, Fisheries and Forestry as part of its Rural Research and Development (R&D) for Profit Program, with further cash and in-kind contributions from 14 project partners covering Rural Research and Development Corporations, the Bureau of Meteorology, universities and state departments.

This project is 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. The project lead is Meat & Livestock Australia (MLA).

SRA acknowledges the funding contribution from the Queensland Department of Agriculture and Fisheries for this research initiative.

Community Trust in Rural Industries

Community Trust in Rural Industries (CTRI) is a unique collaboration of 11 research and development corporations, the National Farmers' Federation and New South Wales Department of Primary Industries to build the capacity of food and fibre industries to productively engage with the community.

The trust landscape has shifted significantly in recent times. No business sector can rely entirely on their financial contribution to the economy, job creation, innovative technologies or strong values as a benchmark for best practice. Increasingly, the public are influencing benchmarks for best practice.

Unless industries can effectively engage with the public on issues and values important to them, in a transparent and consistent manner, then community trust will be compromised and so will the ability to do business effectively.

The CTRI project has been conducted since 2019, with almost 20,000 Australians projecting their voices into the heart of rural industry decision making via a representative annual national survey.

- Year three insights showed increased agreement (88.2 per cent) that rural industries are important to our way of life in Australia.
- More than 50 per cent of respondents believe rural industries in Australia are prepared to change their practices in response to community concerns.
- More than 60 per cent view Australian farmers, fishers and foresters as responsible stewards of the land and sea.

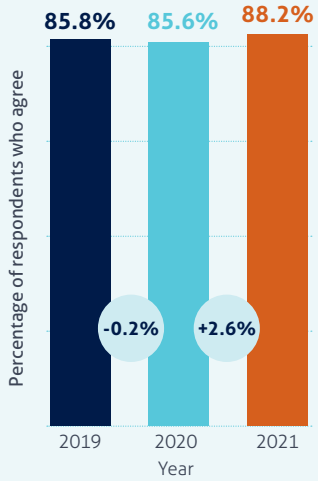
Insights show that where rural industries are considered to effectively manage their environmental performance, and there's a stronger perception of responsiveness, then community trust in rural industries is higher.

In the past three years, the *Community Trust in Rural Industries* program of research has tracked many key attributes in the relationship rural industries have with the Australian community. A key feature of this work has been to go beyond direct measures of sentiment to understand and track features of the social context in which rural industries operate. Primary among these are measures of the broader value Australians place on rural industries, the role they play in our lives, and their economic contribution to the nation.

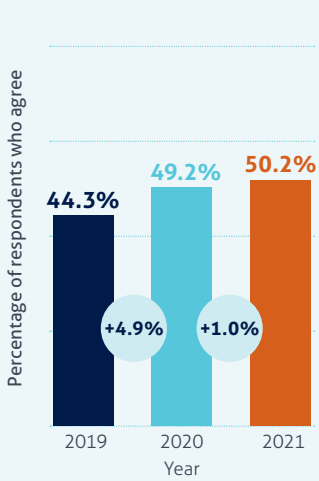
For many Australians, there are issues that rural industries influence and are influenced by, that are of concern to them, such as environmental sustainability, the effects of drought, water use, animal welfare, and chemical use.

CTRI is a jointly funded initiative of AgriFutures Australia, Australian Eggs, Australian Pork Limited, Cotton Research and Development Corporation, Dairy Australia, Fisheries Research and Development Corporation, Hort Innovation, Sugar Research Australia, Grains Research and Development Corporation, LiveCorp, Meat and Livestock Australia and the NSW Department of Primary Industries. National Farmers' Federation is also a project partner and AgriFutures Australia is the managing agent. Research was undertaken by Voconiq, an Australian data science company built on a platform of research developed by CSIRO.

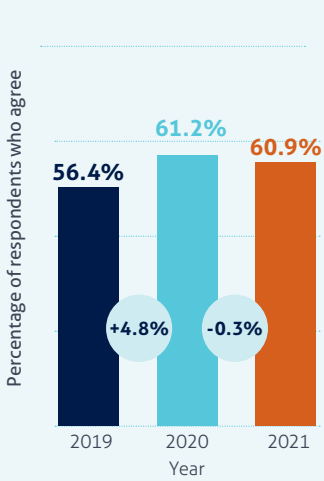
Rural industries are important to our way of life in Australia



Rural industries in Australia are prepared to change their practices in reponse to community concerns



Australian farmers, fishers and foresters are responsible stewards of the land and sea



Adapted from CTRI report.

STRATEGIC PILLAR 3
TRANSLATION EXPERTISE

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

New service delivery model

SRA's new service delivery model, outlined in the strategic plan is focused on three key objectives:

- developing a deep understanding of industry's profitability, productivity and sustainability drivers
- making it easy for industry to extract value from research
- working with and through the industry's local extension providers.

Over the past year, in implementing the new model, SRA has worked to engage at the grassroots; translate, adapt and develop complex science and technology into a compelling product and service offering relevant at a local level; and distribute tools, products, services and scientific expertise to local extension providers.

Feedback from industry

SRA commissioned grower and miller surveys through an independent provider during the final quarter of 2021/22. Questions sought to understand respondents' views about progress towards outcomes in the 2021 – 2026 strategic plan, and to obtain actionable insights to support improvement.

The surveys examined a range of topics including sentiment, connection with organisational goals, perceptions about SRA's research portfolio and products, district engagement, communication needs and experiences and views on the plant breeding program and new varieties.

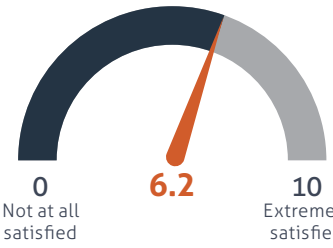
High-level survey outcomes are shared in this annual report and through SRA communications and engagement, and improvement action plans will be developed and shared with growers and millers during the first half of 2022/23.

Grower insights

The grower survey collected insights from 250 levy-paying sugarcane growers who are members of SRA. Feedback was obtained through a combination of online surveys and phone interviews, through independent survey provider, Intuitive Solutions. A summary of overall feedback follows.

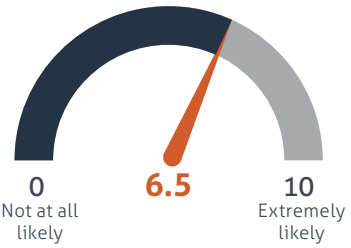
Satisfaction

How satisfied are you that your research and development levy is being invested to achieve the outcomes you expect?



Advocacy

How likely is it that you would recommend the services, products and information SRA provides to other growers or industry associates?



Satisfaction with key grower touchpoints

**The average satisfaction score for each topic is a rating from 0 (extremely dissatisfied) to 10 (extremely satisfied).*

Miller insights

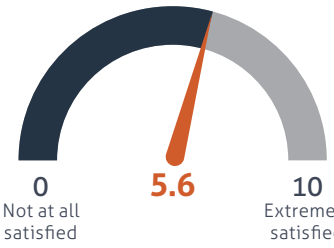
Survey responses were received from 23 representatives across eight of the nine milling companies in the industry.

Feedback was obtained through a combination of online surveys and phone interviews, through independent survey provider, Intuitive Solutions.

This is a summary of their feedback. Milling company averages are reported for companies where more than one respondent provided feedback.

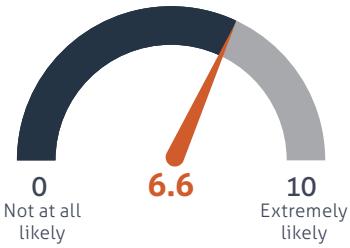
Satisfaction

How satisfied are you that your research and development levy is being invested to achieve the outcomes you expect?



Advocacy

How likely is it that you would recommend the services, products and information SRA provides to other growers or industry associates?



Satisfaction with key miller touchpoints

**The average satisfaction score for each topic is a rating from 0 (extremely dissatisfied) to 10 (extremely satisfied).*

Millers on average reported overall satisfaction with research and development levy investment of 5.6 (on a scale of 0-10, where 0 represents extremely dissatisfied and 10 extremely satisfied). This result suggests moderate satisfaction with SRA.

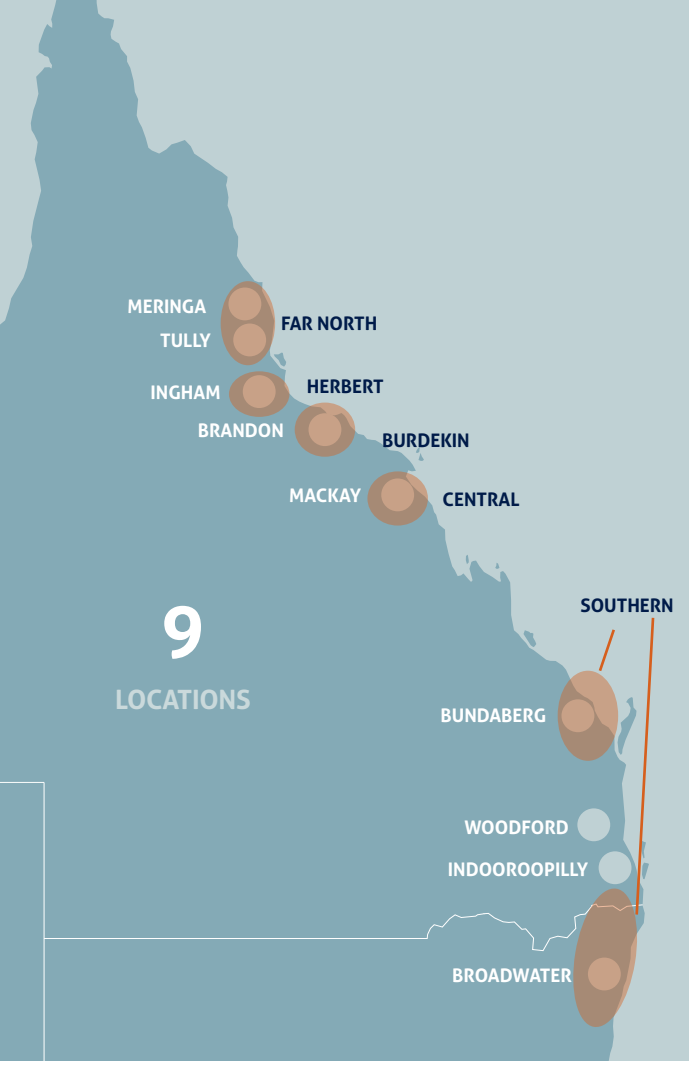
Advocacy of SRA by millers is higher with an average company result of 6.6 on the same scale. Put differently, seven of the eight participating companies report some level of positive advocacy for SRA's products, services and information.

There was a strong statement from millers about their confidence for the future of the Australian sugarcane industry over the next 12 months. Almost all millers reported being confident (94 per cent), with just a very small number holding a more pessimistic outlook.

Millers provide a range of satisfaction ratings for key touchpoints with SRA (from 6.2 to 7.5 on a 10-point scale) suggesting they attach different value to each of the various offerings by SRA.

Millers typically report higher satisfaction with SRA's products and services, variety development program, and research portfolio. However, respondents rate lower satisfaction with 'people' touchpoints such as their experience with SRA district managers (rating 6.2) on the same scale.

Like growers, millers support of SRA's industry and research plans is dependent on their awareness of and familiarity with the plans. Respondents rated on average higher familiarity and satisfaction with these plans than growers.



District manager model

Across each of our five districts, district managers work with local industry and services providers to identify improvement opportunities and develop local productivity plans. SRA district managers provide a direct touch point in each district to build a deep understanding of the challenges and constraints that industry faces in their local area. The district manager approach seeks to strengthen industry collaboration, moving beyond drawing on industry as interviewees or subjects of research, and involving them as equals in the co-creation of strategies in the local area.

The first year under the district manager model has seen development of local productivity plans for each district and an increased focus on managing relationships with local productivity services providers for extension support and connecting industry with researchers.

During 2021/22 the district manager model operated based on the following districts:

Far North

Mossman, Mulgrave, Tableland and South Johnstone growing and mill areas

District Manager – Gavin Rodman

Herbert

Victoria and Macknade growing and mill areas

District Manager – Phil Patane

Burdekin

Invicta, Pioneer, Kalamia and Inkerman growing and mill areas

District Manager – Terry Granshaw

Central

Proserpine, Farleigh, Marian, Racecourse and Plane Creek growing and mill areas

District Manager – Dylan Wedel

Southern

Millaquin, Isis Central, Rocky Point, Condong, Broadwater and Harwood growing and mill areas

District Manager – Lisa Devereaux

Attendees take shelter from rain at the Meringa Field Day.

Far North

In the Far North, the district plan encompasses three broad categories designed to address key constraints:

- understanding key agronomic drivers for productivity improvement based on local practices and systems
- reducing the impact of ratoon stunting disease (RSD) and other diseases
- improving commercial cane sugar (CCS) at harvest.

Understanding key agronomic drivers for productivity improvement

By identifying constraints to productivity at the mill, farm and block levels, strategies can be developed and implemented to improve their management.

Local Expert Analysis

Work being undertaken includes local expert analysis (LEA) in the Tully and South Johnstone areas in collaboration with local industry.

At Tully, following data collection and review, key findings were presented and opportunities identified to refine management practices. Working groups involving SRA and influential, leading growers have further examined pests, weeds and diseases; agronomy; crop maturity; harvesting and data. Key findings have been shared with industry, and an action plan recommended.

In South Johnstone, data analysis is ongoing. Initial interviews and sampling with competent and significant growers confirmed lower than expected productivity. Pachymetra root rot, ratoon stunting disease, nutrient deficiencies and soil acidity are among issues identified. There remains significant potential to improve productivity in the district through continued focus and partnering on the LEA.

Dr Danielle Skocaj and Dr Rob Magarey inspect Joe Zappala's plant cane crop in South Johnstone.

Dr Rob Magarey and Dr Danielle Skocaj review Joe Zappala's productivity performance history.

Mobilising the Murray Reef Trust VII (MRT 7)

SRA is a partner in Mobilising the Murray Reef Trust VII (MRT7) project which is supporting farmers to address productivity constraints and access incentives. SRA has recruited two agronomists, who are working exclusively on the project, to support growers in identifying constraining issues on farm such as soil health, disease and pests, drainage management, nutrient management and low yielding blocks.

Other work includes:

- soil specific management for sugarcane production in the Wet Tropics (National Landcare Program Smart Farms Small Grants funded)
- developing management strategies for emerging and troublesome weeds - navua sedge, itch grass and balsam pear.

As part of the MRT 7 project a soil health workshop with David Hardwick (pictured far left) an agricultural ecologist with Soil Land Food, was held on Derrick and Wendy Finlayson's farm in the Murray Upper district. Participants included growers and extension staff.

Reducing the impact of RSD, and other diseases

Initiatives include a collaborative review of the Innisfail Babinda Cane Productivity Services' Clean Seed Plot and development of an Upgrade Roadmap, with support and development where appropriate for local variety management groups.

Improving CCS at harvest

By measuring and monitoring crop maturity, management strategies such as use of crop ripeners may offer opportunities to improve CCS at harvest.

A highlight of this work has been the creation of eleven trial sites across the Tableland, Mulgrave and South Johnstone mill areas to develop a set of parameters for moisture in cane to support a repeatable result through the expanded use of Moddus® for CCS management.

MSF Sugar's Tableland Cane Supply and Logistics team are supporting this work with a collaborative $49,850 of economic activity to date. The tactical use of ripeners is seen as an opportunity to improve early season CCS in the Southern Tableland, leading to improved harvest logistics throughout the season. Currently, cane is not harvested until later in the season on the Southern Tableland, which is also the longest haul for cane to the mill.

District Manager Gavin Rodman during an engagement event.

Engagement

- 214 engagements recorded in Far North Queensland
- This includes:
  - 104 engagements related to plant breeding
  - 62 engagements related to district managers and activities
  - 48 engagements related to translational research projects and activities
- Key engagement types:
  - 125 meetings including individual, phone and group
  - 56 farm visits
  - 33 workshops, field days, shed meetings and on farm demonstrations

Stakeholders engaged in 2021/22

- Engagements included 759 stakeholders
- Key stakeholder groups engaged with:
  - 41% growers
  - 19% prod services
  - 17% milling companies
  - 8% other industry organisations
  - 10% industry representative organisations

Note: South Johnstone and Tully have now been assigned to a revised North Queensland district along with Herbert; counts are not distinct and it is possible some stakeholders have been engaged, and therefore counted, multiple times.

SRA's Laura MacGillycuddy speaks with industry representatives at the Meringa Field Day.

Herbert

A stakeholder engagement process in the Herbert district identified four district constraints to be addressed under the local district plan.

Across each constraint area, a key focus has been improving dissemination of research knowledge through targeted and timely communication products, training packages and demonstration activities.

Other activities are outlined below.

Herbert Variety Officer Juan Briceno and District Manager Phil Patane at the Herbert variety demonstration plot.

Variety development, selection and adoption

At the local level, variety demonstration plots are being implemented throughout the district, including an open day offering a variety demonstration plot walk-through in conjunction with release of the variety guide.

RSD measurement and management

District level mill assessment is being undertaken using the RSD LAMP Assay test (building upon a research initiative undertaken during the previous financial year.

SRA is assisting in the automation and implementation of the test in the Herbert district.

Improved adoption of new technologies

Development and imminent release of an SRA and Department of Agriculture and Fisheries harvest decision support tool was a specific focus during the year, along with field days designed to increase awareness and adoption of yield and cane loss monitors locally.

A review was also undertaken of the harvester front end with a view to improve ratoonability following harvest.

Sound agronomic practices

Improved agronomic practice focused on a range of activities, including:

- continuation of nitrogen product formulation demonstration trial
- continuation of SIX EASY STEPS® validation trial in the drier climate zone
- validating nitrogen (and phosphorous) rates on very high yielding blocks
- refining nutrient recommendations following application of subsurface banded mill by-products to manage the effect on yield and CCS
- development of nutrient management and soil health tools.

District Manager Phil Patane presents the harvesting efficiency award to Anthony Celotto of Cellotto Harvesting, at Herbert Cane Productivity Services Ltd's Herbert Walk and Talk Day.

There was strong interest in the varieties display at SRA's Herbert Field Day.

Variety Development Manager Herbert Dr Fengduo Hu discusses varieties with an attendee at the Herbert Field Day.

Engagement

More than 50 people attended the Herbert field day in May, including 36 growers not previously recorded as attending an SRA event. The farmers who attended accounted for more than 20 per cent of the local growing district.

Positive feedback suggested that presentations were topical and addressed the key district constraints with good opportunities to ask questions and workshop the topics.

- 84 engagements recorded in North Queensland (including Herbert in 2021/22). This includes:
  - 31 engagements related to plant breeding
  - 52 engagements related to district managers and activities
  - 1 engagement related to translational research projects and activities
- Key engagement types:
  - 40 meetings including individual, phone and group
  - 26 farm visits
  - 18 workshops, field days, shed meetings and on farm demonstrations
- Engagements included 577 stakeholders
- Key stakeholder groups engaged with:
  - 35% growers
  - 19% prod services
  - 13% milling companies
  - 7% government
  - 24% industry representative organisations

Note: South Johnstone and Tully have now been assigned to a revised North Queensland district along with Herbert. Counts are not distinct and it is possible some stakeholders have been engaged, and therefore counted, multiple times.

Burdekin

The Burdekin district plan identifies four constraints that are being addressed at the local level:

- irrigation
- variety management
- soil health
- pests and diseases.

Irrigation

Expressions of interest were received for the Burdekin Irrigation Project from 70 farmers, accounting for 7000 hectares of farming land. To date, full automation of furrow irrigation has been installed on 2000 hectares of land achieving water and energy savings for growers, along with environmental benefits.

Twenty-four presentations about the Burdekin Irrigation Project reached more than 250 growers at shed meetings.

Variety management

Through shed meetings and one-on-one meetings, SRA and Burdekin Productivity Services have partnered to educate growers on the importance of clean seed.

Demonstration walks with groups of farmers and cane grower collectives showcased the local variety program.

Tissue culture was purchased by two growers in the district for the first time, with further interest received for the coming 12 months.

SRA worked with productivity boards and mills to understand estimated CCS levels prior to the commencement of the crushing season. Future work will examine use of growth regulators.

Soil health

SRA collaborated with the Department of Agriculture and Fisheries to deliver a series of successful soil health presentations.

SRA provided advice on ground preparation for mixed species crops, which in the past have had limited uptake in the district due to irrigation costs.

Meetings were also conducted about increasing fallow land to soybeans to meet market demand.

A phosphorous (P) trial undertaken on a Wilmar farm has been converted to a research trial and will provide a good understanding for the local district of P application and yield response.

Australian Cane Farms Farm Hand Duppie Cornel programs the irrigation schedule for the farm.

District Manager Burdekin Terry Granshaw with AutoWeed Technical Officer Jake Wood and AutoWeed Managing Director Dr Alex Olsen in the field during a robotic spray trial on a legume crop.

District Manager Terry Granshaw with Townsville Enterprise Chief Executive Officer Claudia Brumme-Smith, Burdekin Shire Mayor Lyn McLaughlin and Senator Susan McDonald at Farming in Focus.

Pests and diseases

An educational workshop was delivered on ratoon stunting disease and the LAMP assay project undertaken in the Herbert was the subject of a workshop with growers.

Discussions at shed meetings also addressed the RSD project in the Herbert and how the Burdekin would support it. Talks with DAF examined land to trial RSD infected cane and RSD free cane to measure yield loss under an irrigated system.

Soil samples were collected for analysis of a new nematode, never before found in sugarcane in Australia.

Collections of greyback cane beetles and canegrubs were provided for breeding to support research into alternative management treatments. District communications warned of the potential for higher-than-normal infestations of canegrubs.

Discussions about AutoWeed spot spraying trials were a highlight at shed meetings throughout the year, attracting strong interest and support from growers.

Harvesting

As part of a focus to increase yield and profitability through the adoption of new harvesting technology, a cane loss monitor was installed on a Burdekin harvester. The monitor enables trials on loss monitoring in a burnt cane system.

Engagement

- 291 engagements recorded in the Burdekin. This includes:
  - 267 engagements related to district managers and activities
  - 24 engagements related to translational research projects and activities
- Key engagement types:
  - 118 meetings including individual, phone and group
  - 69 farm visits
  - 53 project activities
  - 46 workshops, field days, shed meetings and on farm demonstrations
  - 5 other activities
- Engagements included 1214 stakeholders
- Key stakeholder groups engaged with:
  - 34% growers
  - 20% prod services
  - 5% milling companies
  - 9% other industry organisations
  - 8% government
  - 6% industry representative organisations

Note: Counts are not distinct and it is possible some stakeholders have been engaged, and therefore counted, multiple times.

District Delivery Officer Stephanie Duncan and District Manager Dylan Wedel with sticky traps at a Mackay farm. The traps monitor the presence of insects and mites in an effort to learn more about yellow canopy syndrome.

Central

The Central district plan and work with industry during the year focused on several key issues:

- variety adoption
- irrigation utilisation
- good farm practices through addressing pests/diseases.

Variety adoption

SRA collaborated with local productivity services companies to collect observations on recently and soon to be released varieties growing across 12 sites in the district.

Irrigation utilisation

The team undertook an irrigation survey and on farm irrigation audits to identify opportunities for improvement.

A number of studies were collated to form a submission to the 24th International Commission on Irrigation and Drainage (ICID) International Congress and Irrigation Australia Conference.

Addressing pests and diseases

SRA provided growers with an opportunity to see under ultraviolet light the less than adequate application of imidacloprid which may have contributed to the crop damage from pests seen in the district this year.

A demonstration at shed meetings highlighted the impact of Pachymetra root rot on a susceptible variety compared with a resistant variety.

Monitoring was established at four sites for insect populations believed to be linked to yellow canopy syndrome (YCS).

Team members and growers collected hundreds of greyback cane beetles to support a research project.

Professional development

Another focus was working with local productivity officers to offer professional development across a range of topics to support their recommendations to local growers to improve farming practices.

Topics included:

- soil health extension tool kit
- in-field sucrose loss measurement – harvest loss assessment
- in-field identification of visible diseases
- managing fallow crops in the region
- ratoon stunting disease – research and the importance of farm hygiene
- legislation for N and P budgeting
- SIX EASY STEPS® - incorporating all aspects of nutrient management and the soil and resulting crop
- Farm Economic Assessment Tool Online (facilitated by Queensland Department of Agriculture and Fisheries)
- optimising fertiliser recommendations given high input costs
- weed management – including weed identification and pre-emergent herbicides.

Engagement

SRA's district team engaged with more than 300 growers across the region during collaborative shed meetings, providing updates on SRA activities and answering questions.

Field days undertaken in Proserpine and Mackay in collaboration with local productivity organisations were also an opportunity for around 220 growers to interact with SRA's plant breeding staff, translation researchers and other groups working on productivity/profitability improvement projects in the region.

The Proserpine Ag Tech Field Day was the main event for the Proserpine Young Growers group and was supported in collaboration with Sugar Services Proserpine.

The Mackay and Plane Creek Area Young Growers group was launched in early 2022. Through this group, SRA is supporting young growers to build their knowledge and share information to nurture the next generation of the industry.

- 102 engagements recorded in Central. This includes:
  - 51 engagements related to plant breeding
  - 40 engagements related to district managers and activities
  - 11 engagements related to translational research projects and activities and other events.
- Key engagement types:
  - 53 meetings including individual, phone and group
  - 3 farm visits
  - 3 project activities
  - 38 workshops, field days, shed meetings and on farm demonstrations
  - 5 other activities
- Engagements included 1183 stakeholders
- Key stakeholder groups engaged with:
  - 42% growers
  - 27% prod services
  - 14% milling companies
  - 5% government.

Note: Counts are not distinct and it is possible some stakeholders have been engaged, and therefore counted, multiple times.

Weed scientist Emilie Fillols discusses weed management during a professional development program for productivity services providers in Mackay.

Variety Development Manager George Piperidis talks about varieties at the Mackay field day.

Southern

The Southern district covers sugarcane production areas spanning more than 800 kilometres from north to south, across three distinct geographies:

- Bundaberg/Wide Bay (supplementary irrigation and rainfed)
- Rocky Point (rainfed)
- Northern New South Wales (rainfed).

The most significant challenge identified in the district plan is maintaining individual farm and mill viability in the face of rising input costs and competition for land use.

Environmentally, the region has also needed to adapt and respond to significant weather events, from periods of drought in recent years to this year's severe flooding. In addition, irrigation and energy efficiencies, pest and disease management and soil health are forefront on the list of significant issues in the district.

In addition to local events held during the year, service agreements were negotiated with Northern NSW and Rocky Point cane growing districts to fund projects aligned with their local priorities.

Bundaberg/Wide Bay

In conjunction with the Department of Agriculture and Fisheries, SRA provided a regional report of the Southern Sugar Solutions project, a novel program that linked research, development and extension activities, to Bundaberg, Isis and Maryborough.

New activity during 2022/23 will be the launch of a local expert analysis (LEA) program in the region.

Rocky Point

In Rocky Point, efforts focused on a plan to improve farming systems, nutrient management, varieties and disease management (specifically ratoon stunting disease).

A collaborative event schedule was planned for researchers to deliver workshops and seminars on key priority areas.

In addition, SRA funding supported an agronomist who worked under contract with all growers to prepare productivity plans customised for their farms.

A third workshop was held on soil nutrition and results from the SIX EASY STEPS® trials at Rocky Point.

Northern New South Wales

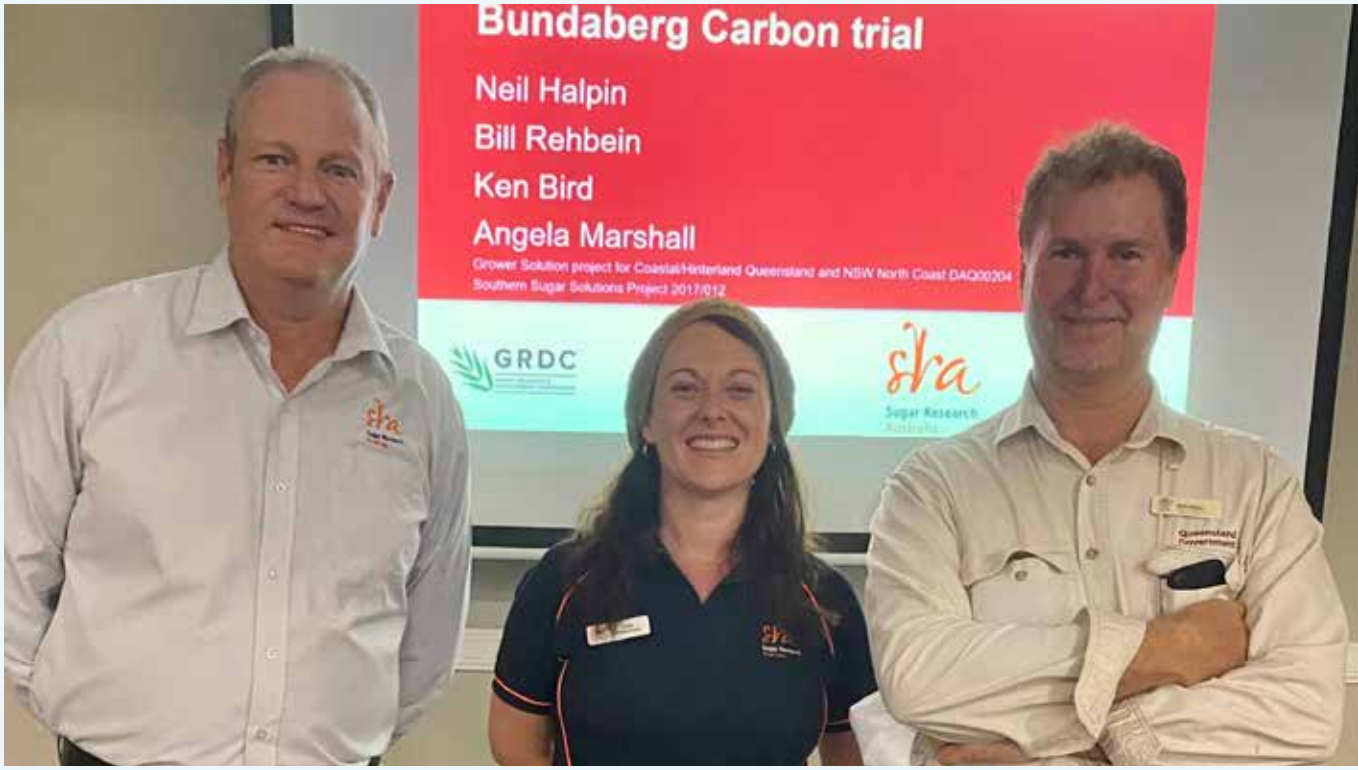
In Northern NSW, SRA has provided industry support through New South Wales Agriculture Services and Sunshine Sugar.

Through a service agreement, SRA seeks to fund projects aligned with the priorities of the AgServices Strategic Plan (2021-2033). Unfortunately, engagement with NSW was hampered by COVID restrictions for the first six months of the year and then flooding in the region.

Although COVID restrictions have now eased, the impact of floods on growers' farms and mill areas will continue to affect the area for the remainder of the year.

One project has been approved for maximising returns through efforts to decrease harvesting losses.

SRA's Barry Salter and District Manager Southern Lisa Devereaux with Neil Halpin from Queensland Department of Agriculture and Fisheries during a workshop at Bundaberg.



SRA's Phil Patane discusses Harvest Best Practice during a workshop at Rocky Point.

Pathology Senior Technician Lucy Gibbs addresses a grower workshop at Rocky Point, explaining how cane samples are analysed in the lab for ratoon stunting disease.

Engagement

Key activities have focused on increasing industry engagement by delivering targeted workshops and seminars with SRA researchers on latest research and trial outcomes from the priority areas that interest growers.

Although there were some travel restrictions due to COVID, several face-to-face workshops were undertaken to coincide with consultation sessions on the district plan.

The team delivered a demonstration of the Soil Health Toolkit, three Harvest Best Practice workshops and two seminars on the local incidence of RSD, while sharing updates on the diagnostic methods currently in trials.

Events were well attended, and positive feedback was received.

- 52 engagements recorded in Southern including NSW & Rocky Point. This includes:
  - 33 engagements related to plant breeding
  - 17 engagements related to district managers and activities
  - 2 engagements related to translational research projects and activities and other events
- Key engagement types:
  - 28 meetings including individual, phone and group
  - 9 farm visits
  - 3 project activities
  - 11 workshops, field days, shed meetings, and on farm demonstrations
  - 3 other activities
- Engagements included 484 stakeholders
- Key stakeholder groups engaged with:
  - 34% growers
  - 27% prod services
  - 18% milling companies
  - 10% industry representative organisations.

Note: counts are not distinct and it is possible some stakeholders have been engaged, and therefore counted, multiple times.

Other events and sponsorships

In addition to work under the district plans, SRA supported and participated in a range of events across sugarcane growing regions and communities.

Regional Milling Research Seminars

Approximately 100 milling representatives attended this year's Milling Regional Research Seminars, jointly presented by Queensland University of Technology and SRA during March.

Sessions were conducted at Gordonvale, Townsville, Mackay, Bundaberg and Rocky Point, with representatives of the New South Wales industry joining the Rocky Point event through a virtual video link.

The sessions provided an update on milling research undertaken over the past 12 months.

SRA's Andrew Lynch, QUT's Geoff Kent and Wilmar's Jay Venning and Russell Kirk at the Townsville seminar.

The Townsville Milling Regional Research Seminar drew strong attendance.

ASSCT Conference

SRA was a gold sponsor and exhibitor at the Australian Society of Sugar Cane Technologists' (ASSCT) conference held in Mackay in April, with the theme of *Future proofing a resilient industry.*

The three-day event included an exhibition, conference program and tours, showcasing the latest in research and development from across the industry.

The conference is the flagship event of ASSCT, an association of scientists, technologists, growers, millers, managers, institutions and companies concerned with the technical advancement and sustainability of the Australian sugarcane industry.

Attendance at this year's event was 65 per cent higher than at the 2021 conference in Bundaberg, and the largest attendance since the 2003 conference held in Townsville.

Multiple papers and presentations at the conference related to research by SRA employees and initiatives funded by SRA.

Part of our communities

SRA is part of the communities in which it operates, and wherever possible is involved in community events aligned with its operations, and in supporting local volunteering groups.

Examples during 2021/22 include exhibiting at the Gordonvale Sugar Solstice, participation at regional shows and engaging with community groups to support their fundraising during our field days.

Nicole Thompson accepts an award at ASSCT from Ross Broadfoot.

SRA's Barry Salter, Emilie Fillols and Julian Connellan were among presenters at ASSCT.

SRA's booth at ASSCT.

Translate, adapt and develop

Laboratory screening services

SRA houses several internal laboratories that provide analytical and diagnostic services and support to SRA-led projects, industry partners and external clients.

Facilities at Indooroopilly offer chemical analytical services (chemical laboratory) and molecular diagnostic services (molecular diagnostics laboratory) for various sugarcane diseases, including ratoon stunting disease.

The chemistry laboratory provides a suite of services to analyse the composition of soil, plant tissue, water, by-products and other samples. The lab primarily services SRA-led research projects, but also supports external customers with measurement of micro and macro nutrients and near infrared (NIR) calibration development. The chemistry team also provides specialist tests and method development capabilities, such as environmental analysis of chemical residues and their breakdown products, and supports SRA's sugarcane breeding program by conducting quality screening analysis of advanced clones.

While the chemistry laboratory was severely affected by the rain event of early 2022 and some areas had to be shut down for a period of time, the team delivered on the majority of project requirements and made notable contributions towards research and development activities.

The Tully station also has a diagnostics soil laboratory that specifically assays for Pachymetra root rot and nematodes.

During 2021/22, SRA received more than 18,500 samples, completing just under 29,800 assays or tests.

Laboratory	Analysis type	Samples	Assays
Chemistry Laboratory	Nutrients	2,687	7,745
	Residues	165	5,610
	Sugarcane quality	1,516	1,516
Molecular Diagnostics Laboratory	Near infrared	315	949
Soil Laboratory	Ratoon stunting disease	13,038	13,038
	Pachymetra	669	778
	Nematodes	34	143
	Pachymetra & nematodes	109	na
Total Samples/Assays		18,533	29,779

Among the highlights for the laboratory team during the year were:

- A significant amount of method development was undertaken in both the NIR and residue areas. Soils were scanned and preliminary NIR models developed to measure various nutrients in dried soils, fresh soils and in water samples. The data will support the feasibility of developing an in-field soil/water analysis tool for the rapid, non-destructive measurement of nutrients for improved soil health management.
- SRA's ability to conduct trace-level environmental screening for residues and their breakdown products was expanded to include the insecticide imidacloprid, up to 23 types of herbicide and 12 major metabolites of these compounds. The bespoke analyses were developed to support research and development in the areas of farm chemical management and best practice. The work supports the development of strategies to increase the retention of compounds on farm, reduce input costs, and monitor environmental impact to the Great Barrier Reef water catchments.
- Resistance screening protocols based on modern molecular methods were developed and a trial planned to screen 14 new varieties for resistance ratings. This work aims to fill an industry-driven call to bring back RSD "ratings".
- The team assisted with the experimental and trial designs for a Griffith University Australian Research Council Linkage project that aims to incorporate new sensor technologies from medical diagnostics to develop an integrated device for the rapid, on-farm detection of various sugarcane diseases.

Communications

SRA communicates with the industry through a range of print, digital and face-to-face to channels.

The team develops and releases a quarterly magazine, fortnightly eNewsletter, multiple manuals and booklets including variety guides, and manages the website, social media channels, webinars and supports multiple face-to-face events.

The number of face-to face events increased markedly during 2021/22 under the district manager model and easing of COVID-19 restrictions.

Another change this year has been the creation of a new internal newsletter for SRA employees, *Sugar Press*. *Sugar Press* is released fortnightly and is designed to share important whole of business updates across SRA, reducing the number of emails in the business. It is released in alternate weeks to the industry-facing *eNewsletter*.

Cane Matters

This year, following consultation with industry representative groups, SRA merged the quarterly *CaneConnection* and bi-annual *Milling Matters* magazines to produce a new quarterly publication named, *Cane **Matters***.

While combining the titles of previous publications, the title represents a strong statement on the importance of the sugarcane industry to regional communities and economies – cane matters.

Insights suggest there is a 'disconnect' across the industry regarding the problems each part of the supply chain is trying to address, why those problems matter, and how SRA is contributing to the solutions through research. To address this, SRA needed to provide more effective and broader visibility of research across the supply chain.
*Cane **Matters*** aims to support broader understanding of the challenges SRA's research is intending to address and make our communications more relevant to our levy payers.

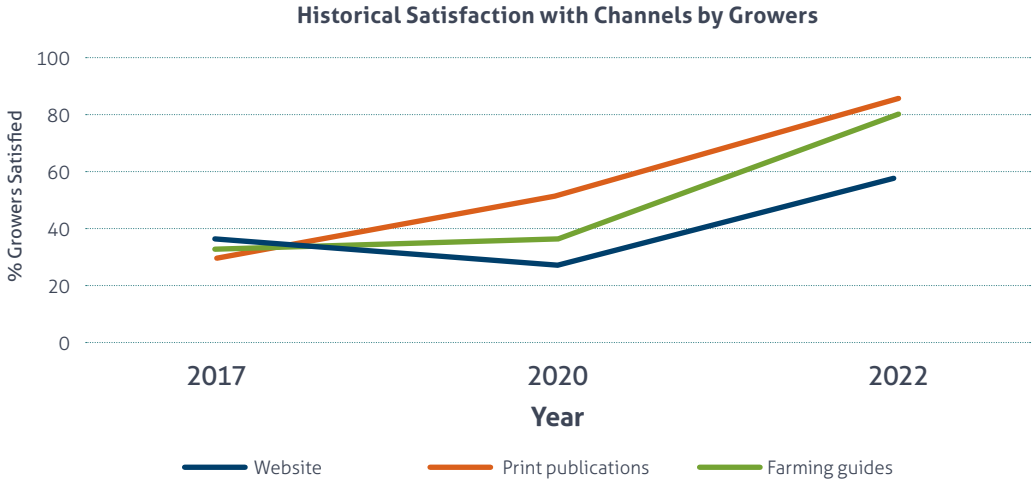
*Cane **Matters*** is also a platform to help change the narrative across the industry - to grow confidence and pride in the future, while being open about the realities and challenges our industry faces. *Cane **Matters*** is available as a print magazine for members and electronically for subscribers, or more recently, in an online flip magazine format.

The vast majority of subscribers continue to receive *Cane **Matters*** in print format. While other industries are trending away from print publications, feedback suggests the majority of subscribers still wish to receive the magazine in hard copy format.

While take-up of SRA's electronic channels is growing, a proportion of growers report being unfamiliar with them.

Among growers, awareness of, and satisfaction with key communications channels such as the SRA website, the *Cane **Matters*** magazine (previously *Cane Connection* and *Milling Matters*) and farming guides increased from previous survey periods.

Satisfaction with face-to-face or online knowledge transfer events also rates highly among growers, millers and investors and partners.



Channel highlights

SRA regularly undertakes surveys of industry members to gauge satisfaction with services and communications channels and to identify improvement opportunities.

Highlights include:

- grower satisfaction of 7.7 (out of 10) for *Cane **Matters***
- feedback included: "top job on the new *Cane **Matters*** mag. It really profiles the contribution of your team and highlights the people behind the research. Good mix of content, too."

Strategic Pillar 3: Outcome measures

Levy payers are satisfied with SRA products, services, and varieties

Target – 75% of levy payers satisfied by 2026

Result – For products and services: 87% of growers and 98% of millers, who were familiar with SRA services and products, report an average satisfaction rating in response to these.

For varieties: 81% of growers and 92% of millers report an average satisfaction rating with SRA's plant breeding program.

Source: SRA Grower and Miller Surveys 2022

Growers have awareness of SRA's research programs and outcomes

Target – 75% of growers by 2023

Result – 86% of growers report that they are very familiar or have some understanding of at least five research programs and outcomes.

Source: SRA Grower and Miller Surveys 2022

Industry participants rate SRA as a trustworthy organisation

Target – 75% of industry participants rate SRA as trustworthy by 2026

Result – 76% of growers and 94% of millers report an average satisfaction rating in response to SRA staff being a trusted information source.

Source: SRA Grower and Miller Surveys 2022

Impact of SRA's industry services activities contribute to industry productivity gains

Target – Contribution to industry productivity gains of up to 10% per district by 2026

Result – It is not yet possible to report on this measure as SRA's district productivity plans were only recently implemented. This measure will be reported in future annual reports.

Year-on-year expansion of self-service, digital and automated service delivery options to strengthen engagement and communication reach

Target – Year-on-year expansion of delivery options

Result – In 2021/22, engagement with SRA's digital and self-service products was as follows:

QCANESelect®: 75% of growers and 58% of millers are familiar with the tool, and satisfaction by both groups is 7.3 on a scale of 0-10.

SIX EASY STEPS®: 84% of growers and 66% of millers are familiar with the program, and satisfaction is 7.2 and 7.8 respectively on a scale of 0-10.

Soil Health Toolbox: 56% of growers and 52% of millers are familiar with the tool, and satisfaction is 7.1 and 6.4 respectively on a scale of 0-10.

Source: SRA Grower and Miller Surveys 2022

Calibration and screening services are cost neutral

Target – To be reported: Cost neutral by 2024

Result – The outcome will be measured when data becomes available and reported in SRA's 2022/23 Annual Report.

Total commercial production is from new varieties

Target – 20% of commercial production is from new varieties by 2026 (average across districts)

Result – 'New varieties' are those varieties within 7 years from the release decision by the Regional Variety Committee. Production of new varieties increased from 3.7% in 2020 to 5.4% in 2021.

Source: SRA

STRATEGIC PILLAR 4
WORLD-CLASS SUGARCANE VARIETIES

Accelerate innovation in variety development to offer innovative, high-performing varieties that consistently underpin the success of the industry's crop production and protection while lowering development costs and shortening cycle-times

Varieties form the foundation of SRA's work to improve the productivity, sustainability, and competitiveness of Australia's sugarcane industry.

The 2022 Plant Breeding Rights (PBR) portfolio comprises 65 registered varieties representing more than 97% of commercial production. Fifteen new varieties reached Granted status over the past two years, while 19 varieties have had PBR terminated.

In the early stages of the plant breeding program, large numbers of clones are produced without the ability to predict how they might perform. As the breeding selection process progresses, SRA learns more about a range of factors that positively and negatively impact variety performance. SRA's variety development managers are responsible for regional selection programs testing new experimental clones from inception through to final assessment on commercial farms.

Performance information for elite candidates is presented to Regional Variety Committees (RVC), which make decisions on the final stages of the variety release pipeline (accelerate, propagation and release).

Regional Variety Committees

New varieties are released with the approval of RVCs. RVC voting members comprise grower and miller representatives, and meetings are attended by staff from 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.

The commercial experience of committee members and attendees with the strengths and weaknesses of existing varieties, is an important contribution to the debate on the merit of new candidates.

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.

The RVC structure also has a key role in industry biosecurity. The committees have a responsibility to maintain 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.

A number of new varieties were approved for release by RVCs in 2022.

New varieties approved for release by Regional Variety Committees in 2022

NAME	REGION	PEDIGREE	KEY ATTRIBUTES
QS10-445	South	QN80-3425 x CP95-1569	Approved for release pending leaf scald resistance rating. It has a very strong disease resistance profile, lower CCS but high productivity and good stability across ratoons.
SRA38$^{\Phi}$	South	QS92-339 x TCP87-3388	Resistant to Pachymetra, mosaic and Fiji leaf gall. Intermediate-resistant to smut and leaf scald. SRA38$^{\Phi}$ has shown CCS slightly above Q208$^{\Phi}$ and a 5% yield advantage.
SRA36$^{\Phi}$	Herbert	QN80-3425 x Q142	SRA36$^{\Phi}$ has an excellent disease resistance profile and is resistant to Pachymetra, smut, mosaic, leaf scald and Fiji leaf gall. It trends to slightly lower CCS and slightly higher tonnes of cane with an average 2% sugar yield advantage over Q200$^{\Phi}$ and Q208$^{\Phi}$ across 45 trial harvest events in the Herbert.
SRA37$^{\Phi}$	North	QC82-663 x Q205	Intermediate-resistant to smut and Pachymetra, and resistant to leaf scald, brown rust, red rot, Fiji leaf gall and mosaic. It has shown an 11% sugar yield advantage over Q200$^{\Phi}$ and Q208$^{\Phi}$ in field trials and this is most evident in ratoon crops.

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, a number of varieties were approved for production in additional regions and the leading candidates for broad scale adoption are:

- SRA9Φ – Central and Northern
- SRA26Φ – Northern, Herbert, and Central
- SRA28Φ – Northern and Herbert
- SRA32Φ – Burdekin and Northern
- SRA34Φ – NSW, Southern, and Burdekin.

Driving lower costs

SRA's Variety Development business unit was established following an external review of plant breeding in late 2020. The structural change consolidated teams that previous reported to three executive managers under a single executive to lower costs and support improved effectiveness of plant breeding.

The review also recommended merging the early generation selection stages for the Central and Southern selection programs, which has now been implemented. The revised approach continues to feature parent selection and crossing specifically for the Southern region, but the progeny assessment is 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.

Early generation germplasm from the Southern program has been genotyped and added to the training population for genomic selection which enables another approach to ensure the most appropriate clones are advanced to field trials in the Southern region.

Breeding activity in the South will focus on Final Assessment Trials (FATs) 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 approved budget for 2022/23 represents a 10 per cent reduction in net expenditure in real terms compared to the 2019/20 baseline which meets the SRA Strategic Plan target.

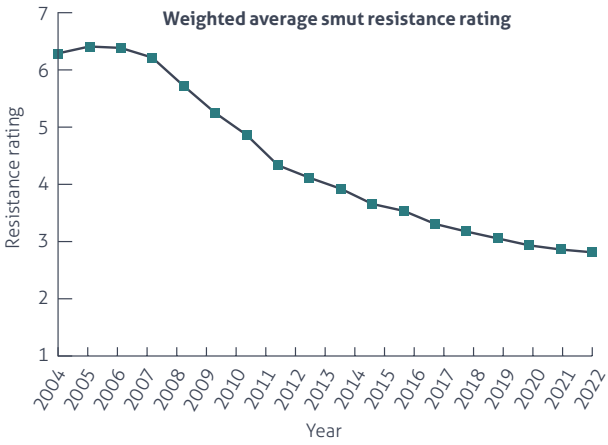
Improving disease resistance

Smut resistant varieties

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

In 2021, the average rating was 3.48 which provides significant risk mitigation on a whole of industry scale. 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 in high disease pressure situations. The level of smut resistance across the crop is expected to continue to improve as intermediate varieties such as Q200Φ and Q208Φ are replaced by new resistant varieties.

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

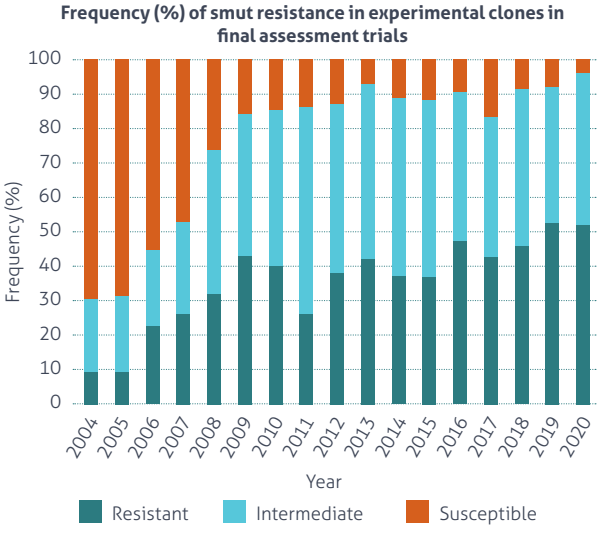


Varieties with a rating less than 3 are resistant, ratings of 4 – 6 are intermediate, and above 6 are susceptible.

Selection for smut resistance remains a high plant breeding priority. Significant effort goes into identifying susceptible candidates which can be discarded before promotion into FATs.

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 to 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 below. The number of clones susceptible to smut in FATs was reduced to less than 5 per cent for the first time in the 2020[1] trial series. Maintaining at least this level of resistance positions SRA to release future varieties that meet grower requirements for smut resistance.



[1]*Trials are named for the year they are planted. The 2020 trial series was first harvested in 2021.*

Combining disease resistance with improved productivity

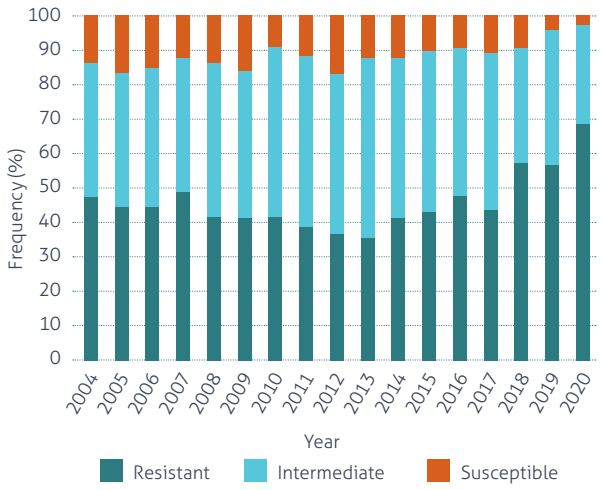
The soil borne fungus *Pachymetra chaunoriza* causes economically important yield losses in susceptible and intermediate rated varieties. The damage to root systems from the pathogen can also compromise milling quality through the stools of the plant entering the cane supply.

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

In recent years, SRA has invested to double the capacity of Pachymetra resistance screening at the Tully site. 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 2020[1] trials, the frequency of Pachymetra susceptible clones was reduced to less than 3 per cent, and the level of resistant clones increased to 69 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



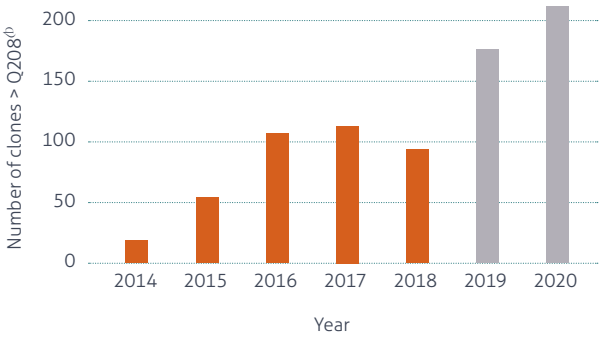
Improving genetic gain

SRA uses a range of population genetics metrics in the breeding program to monitor underlying rates of genetic gain. One of these metrics is a simple count of elite clones.

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

The number of experimental clones with higher industry profitability than the reference variety Q208$^{\phi}$, is shown below. In the 2014 FAT trial series, there were 21 clones superior to Q208$^{\phi}$ which offers a modest probability of releasing varieties that will drive productivity improvements. The number of elite clones increased to 121 in the 2017 trial series and to 208 in the 2020 series. Both the 2019 and 2020 trial series have further data to be collected. However, the lead indications are 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



[1]*Trials are named for the year they are planted. The 2020 trial series was first harvested in 2021.*

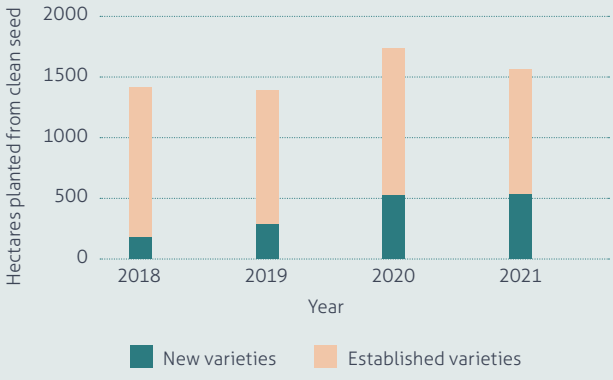
Clean seed and tissue culture

Planting material is sold in several formats and is converted into hectares based on industry average planting rates.

Several independently operated clean seed distribution plots were unavailable to supply growers in 2021 due to disease infection issues. This affected the total volume of clean seed sales. However, new variety sales increased slightly from volumes in 2020 demonstrating strong and sustained grower demand.

The use of tissue culture has shown similar trends over recent years. In 2020, total tissue culture plantlets delivered were 91,045 which increased to 101,010 in 2021. Tissue culture orders for delivery in 2022 have further increased to 105,285 plantlets.

Trend over time for approved seed sales of sugarcane varieties



Other highlights

- The breeding program identified nematode resistance in a wild sugarcane relative, and have crossed it with Q208Φ, and screened the offspring for resistance. Resistant progeny were crossed with a range of elite parents and around 4,000 offspring planted to the field in 2022. A combination of traditional pragmatic selection, nematode resistance screening, and genomic selection will be used to fast track the progression of promising candidates into advanced trials. All commercial varieties are susceptible to nematodes and this new resistance is expected to deliver significant yield and yield stability benefits to growers.
- New Variety Fact Sheets are a major improvement on the old version generated through QCANESelect®. Information sheets now include performance data and actionable agronomic management features.
- 136 drone (unmanned aerial vehicle) flights were undertaken across the Central, Burdekin, Herbert and Far North districts as part of SRA's phenotyping work. Phenomics is focused on the observable characteristics and measure of the plant's physical and physiological traits. The use of drones and machine learning algorithms provides data on how different clones and varieties are performing.
- SRA9Φ increased to 7.5 per cent of Mackay area production and its strong commercial performance is expected to drive further grower adoption. The first large scale harvest of SRA26Φ has reinforced the CCS advantage identified in SRA field trials, and it is likely to be one of the most planted varieties in the Herbert and Northern regions this year. The first commercial harvest of SRA32Φ returned a yield of 153 tonnes of cane per hectare (TCH) compared to the Tableland mill average of 114 TCH. While the comparison is confounded by the effects of older ratoons in the mill average, it does reinforce the high yield potential of SRA32Φ.

Satisfaction with varieties

SRA's grower survey sought feedback on SRA's variety 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 plant for the first time, the following were most popular (noting not all varieties are available in all districts):

- SRA26Φ - 11%
- SRA22Φ – 6%
- SRA28Φ – 9 %
- SRA21Φ – 5%
- SRA23Φ – 7%
- SRA32Φ - 5%.

Feedback reinforced the appetite and importance of 'locally proven' new varieties. In particular, growers wanted to understand variety performance in different growing conditions (soils, locations, climate).

Strategic Pillar 4: Outcome measures

Efficient plant breeding program

Target - Achieve planned genetic gain at an allocation of 50% levies (not including pre-breeding R&D investment), whilst achieving target genetic gain of 2% year-on-year

Result - 2021/22 net expenditure on plant breeding was $1.7 million less than the target of 50% of industry levies. The ratio of net investment per percentage point of genetic gain improved from $23.4 million in 2020/21 to $10.2 million in 2021/22.

Source: SRA

Reduce varietal development costs

Target - Reduce costs by 10% from 2020 baseline by 2023

Result – Building on cost reductions achieved in 2021/22, SRA's 2022/23 budget represents a 10% reduction in net expenditure compared to the 2019/20 baseline.

Source: SRA

Reduce varietal development costs

Target - Reduce costs by 15% from 2020 baseline (5% incremental savings) by 2026

Result – On track. The 2022/23 budget represents a 10% reduction in net expenditure compared to the 2019/20 budget.

Source: SRA

Leverage SRA's breeding capabilities to develop strategic partnerships and commercial returns

Target - Leverage capabilities to develop strategic partnerships and commercial returns by 2025

Result - This measure will be reported in future annual reports.

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

While much of SRA's work under this pillar focused on setting the foundation for the period ahead, there were several notable areas of progress.

See & Spray™ Select Technology

SRA is collaborating with University of Southern Queensland, Horticulture Innovation Australia and Cotton Research and Development Corporation to commercialise the intellectual property for vision-based precision spray technology for use on fallow ground with John Deere, as part of their See & Spray™ Select technology.

Typical herbicide savings delivered through the technology average 77 per cent, demonstrating the value and impact that comes from solution-focused investment in technologies that address significant industry challenges. Additionally, the cross-sectoral collaboration increases the total impact from investment and underpins strong product focus between research providers, investors and commercial partners.

Expand funding and investment partners

As outlined under the cross-sectoral research section of this report, SRA is engaging with Agricultural Innovation Australia to develop cross-sectoral, multi-disciplinary solutions in areas of common priority, including climate resilience and carbon accounting.

This provides significant leverage of SRA investment with other research and development corporations and private partners to deliver solutions for the sugar industry.

Plant Breeding Rights

SRA maintains on behalf of the industry, control of intellectual property through Plant Breeding Rights and has rights to charge royalties. While rates for the Australian industry are currently set to zero, international opportunities are being explored. The 2022 Plant Breeding Rights portfolio comprises 65 registered varieties representing more than 97 per cent of commercial production. Fifteen new varieties reached Granted status over the past two years, while 19 varieties have had PBR terminated.

Cane Mapping and Analysis

SRA invested in defining the development requirements for CaneMAPPS – Cane Mapping and Analysis for Productivity, Profitability and Sustainability.

The objective is to provide growers a central digital portal for data-driven decision-making to enable optimisation of their farming operations to achieve profitability and productivity, while ensuring compliance with legislation and community expectations regarding environmental sustainability.

The platform will enable interrogation of SRA systems – such as SPIDNet and QCANESelect – alongside external databases - including soil and weather resources; importing and storing farm and industry data; and enabling automation of current data processing procedures to enable timely, data-driven discussion and decision-making.

Fee for service and consulting activities

Fee for service and consulting activities included drone-based monitoring of field trials, sugarcane variety identity verification using DNA technology, validation of cane loss monitors, testing new chemical products for control of soil borne pathogens and near infrared (NIR) scanning services to milling companies. SRA also received payment through externally funded initiatives to support targeted grower adoption initiatives.

The micro NIR is proving it has a place in the sugar industry as a fast and cost-effective tool for crop wide ratoon stunting disease detection.

Strategic Pillar 5: Outcome measures

Deliver net returns from commercial activities

Target – Deliver more than $4 million in net returns per annum by 2026.

Result – 2021/22 was a foundational year under this pillar. This measure will be reported in future annual reports.

Near infrared services

SRA provides NIR calibration support services to multiple Australian mills, one international mill and four Queensland bulk sugar terminals, earning a support fee for these services. Instruments supported include cane analysis systems, bagasse analysis systems, sugar analysis systems and benchtop laboratory systems.

Online cane analysis systems supported by SRA are installed at the beginning of a mill's milling train, with the instrument able to scan the incoming cane every 10 seconds. These NIR scans are automatically processed through SRA's calibrations, with predictions for 29 cane parameters being generated. The results are used by mill staff to assess cane quality, support mill process control decisions, for internal auditing purposes and to support grower cane payment.

- 13 cane analysis systems delivered 8.53 million scans across 213,000 cane consignments
- this equates to approximately 1,113 days of continuous scanning
- about 9.92 million tonnes of cane was assessed by NIR in Australia.

The online bagasse analysis system is used for mill process control and bagasse quality assurance.

The online sugar analysis system is used for process control and sugar quality assurance.

Benchtop NIR systems are installed in mill laboratories (five instruments) and at the bulk sugar terminals (four instruments). Mill laboratories use these systems to predict various parameters (e.g., pol, moisture, fibre) on different process streams (e.g., molasses, massecuite, raw sugar). Mills use these data to support process control decisions and for quality assurance.

Five mill laboratory NIR systems provided predictions on 20,600 samples scanned.

The bulk sugar terminals use benchtop NIR systems to inform blending ratios for quality control of Australia's export raw sugar.

An SRA-supported research project is developing an in-field DNA-based surveillance method to speed-up identification of pests and diseases.

REPORTING TO FUNDING AND COLLABORATION PARTNERS

This section addresses SRA's performance requirements with the Commonwealth Department of Agriculture, Fisheries and Forestry (DAFF) and the Queensland Department of Agriculture and Fisheries (DAF). It also examines research and development corporation (RDC) impact indicators.

Statutory Funding Contract and Performance Principles

In August 2021, SRA signed a new 10-year Statutory Funding Contract (SFC) with the Commonwealth Government for 2021-2031.

The agreement includes new Performance Principles, which reflect a heightened focus on outcomes and outputs from research, along with new guidelines for funding agreements, knowledge transfer and commercialisation, and stakeholder engagement.

Under its funding contract, SRA is required to report and demonstrate its performance against five Performance Principles relating to:

1. Stakeholder engagement
2. Research, development and extension (RD&E)
3. Collaboration
4. Governance
5. Positive outcomes and benefits.

While the whole Annual Report highlights SRA's performance, this section highlights our work to address the Performance Principles specifically, and the location of related information throughout the report.

Stakeholder engagement

Engage stakeholders to identify RD&E priorities and activities that provide benefits to the industry

SRA's Engagement and Consultation Plan guides our interactions and engagement with individuals and organisations and seeks to ensure that the engagement and consultation we undertake is meaningful.

SRA engages with a range of stakeholders in relation to RD&E, including grower and milling levy payers, industry representative organisations, research organisations, productivity services providers, and industry and agricultural representatives domestically and internationally.

Highlights for 2021/22:

- Co-designing with industry representatives, the first *Annual Investment Plan* under the *Strategic Plan 2021-2026*, including root problems, challenge statements and priority investment areas (see more on p 20).
- Developing District Productivity Plans in consultation with local industry representatives to address specific constraints at the district level. (see district manager model – pp 57 to 67).
- Undertaking 754 engagements with more than 4,248 industry, research and government stakeholder cases across growing districts under the new district manager model (pp 57 to 67).
- Engaging with 43 industry and research partners representing 15 organisations, including but not limited to, levy payers, government, and universities, in the identification of RD&E priorities and activities in 2021/22 (p 20).
- Engagement commenced on proposed constitutional changes relating to a restructure of the Research Funding Panel and engagement on these proposals will continue into 2023. Consultation also occurred in relation to proposed minor administrative corrections and enhancements to the Constitution resulting from recent changes to the Corporations Act regarding electronic meetings and procedures.
- Delivering communications through our channels, including realigning them to better meet stakeholder needs (p 70).

Research, development and extension

Ensure RD&E priorities and activities are strategic, collaborative and targeted to improve profitability, productivity, competitiveness and preparedness for future opportunities and challenges through a balanced portfolio

Development of our research investment plans involves extensive engagement with industry, including grower, milling, research partner and government stakeholders, as well as SRA employees.

We incorporate stakeholder feedback to ensure investment is targeted in the areas of greatest need and on issues that matter most to industry.

SRA also operates a Board committee to provide independent oversight of the direction of SRA's research investment, portfolio decisions and performance monitoring and evaluation.

Highlights for 2021/22 include:

- Co-designing with industry representatives, the first investment plans under the *Strategic Plan 2021-2026* through a series of surveys, workshops and briefing sessions (p20).
- SRA's Research Portfolio is aligned with the strategic plan and industry-identified Research Missions: 56.7 per cent of investments focused on improvements in farming and milling profitability, 17.3 per cent on positioning the sugarcane industry to stay ahead of climate, environmental and biosecurity threats, 3.6 per cent on developing diversification opportunities in the bio and green economies, 17.8 per cent on wealth generation through land stewardship, and 4.5 per cent on supporting capacity building for researchers and industry stakeholders.
- SRA launched the Industry Feedback Collector in 2021/22 to measure knowledge transfer and adoption by levy payers who engage with SRA supported extension and adoption activities.

Sugarcane surrounding Pioneer Mill in the Burdekin.

Collaboration

Undertake strategic and sustained cross-industry and cross-sectoral collaboration that addresses shared challenges and draws on experience from other sectors

We create opportunities for collaboration and work with a range of partners to address common challenges.

Highlights for 2021/22 include:

- Leading the collaborative development of the Sugarcane Industry Roadmap with industry representative organisations and partners (p37).
- Partnering with other rural and research development corporations on nine cross-sectoral research projects, and participation in growAG and Agricultural Innovation Australia (p 51).
- Working with more than 100 collaborative research organisations and partners to deliver on our research programs (p 50).
- The district manager approach strengthens industry collaboration, moving beyond drawing on industry as interviewees or subjects of research, and involving them as equals in the co-creation of strategies at the local area (pp 57 to 67).

Governance

Governance arrangements and practices fulfil legislative requirements, align with contemporary Australian best practice for open, transparent and proper use and management of funds

In developing and implementing SRA's corporate governance framework and practices, SRA has taken into account the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*.

SRA's Board reviews and updates the Company's corporate governance framework, policies and practices to ensure that they reflect changes in law, stakeholder expectations, and the current operating environment, as well as aligning the Company's practices to better-practice developments in governance.

The Constitution, the SFC and other documents and policies relevant to SRA's corporate governance framework (including a Governance Policy) are available on SRA's website.

A summary of Corporate Governance is provided from p 86. A more detailed Corporate Governance Statement is published separately on the SRA website.

The Directors' Report is available from p 88.

Positive outcomes and benefits

Demonstrate positive outcomes and delivery of RD&E benefits to Levy Payers and the Australian community in general and show continuous improvement in governance and administrative efficiency

SRA commenced an important update of its monitoring and evaluation (M&E) framework to improve measurement and reporting of the performance and impact of the research portfolio, and to drive improvements in investment planning. This update was in response to SRA's *Strategic Plan 2021-2026* objectives and SRA's *Independent Performance Review* completed in 2020/21.

Key changes to be implemented include expanding M&E to all investments, regardless of funding source and type of research and development undertaken, and targeted indicators of productivity, profitability, environmental sustainability, and social value. The framework will continue to be refined during 2022/23 across SRA's diverse research portfolio, industry services, and plant breeding program.

In 2021/22, SRA and partners engaged three independent consultants to undertake 12 benefit-cost analyses of eight RD&E investments and two programs. These analyses quantified the monetary benefit by solutions delivered to the sugarcane industry as well as detailing impacts such as improvements to productivity and avoided losses from disease.

The aggregated benefit-cost ratio for these analyses is 5.5 to 1. For every $1 invested by SRA, the Queensland Department of Agriculture and Fisheries, the Australian Department of Agriculture, Fisheries and Forestry, and other partners, $5.50 of economic value was created. The estimated net present value is $396.9M. More information is included from p 22.

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

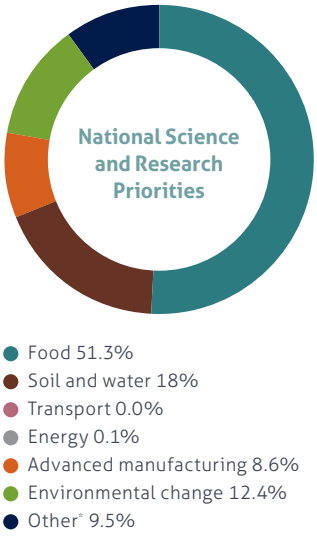
Item	Requirement	Location in Annual Report
a	Sources of income allowing for separate identification of Levy Funds, Matching Payments and Voluntary Contributions	Funding - p 5 Financial statements - from p 95
b	Significant R&D activities and transactions undertaken in the year in the conduct of SRA's functions as the industry services body	Strategic Pillars 2,3 and 4 - pp 19 to 75
c	The full cost of the R&D Activities	Strategic Pillar 2 - from p 19
d	Progress made in implementing the Strategic Plan and Performance Principles including progress against any key performance indicators	Strategic Pillars 1-5 - pp 15 to 77
e	Key RD&E deliverables and associated outcomes achieved	Strategic Pillars 2,3 and 4 - pp 19 to 75
f	An assessment of the efficiency and effectiveness of SRA's investments	Strategic Pillar 2 - from p 19
g	Material changes to SRA's membership	No material changes Directors' Report - p 88
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 New Performance Principles and Guidelines published online
i	Consultation with Levy Payers and Industry Representative Organisations on: ■ SRA's Strategic Plan; and ■ RD&E	*Annual Investment Plan* - p 22 Translation expertise - from p 54, including district manager model Regional Variety Committees - p 72
j	SRA'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 - cross-sectoral partnerships p 51
k	Details of senior executive and Board remuneration in the format required by the relevant Australian Accounting Standards	Financial statements - from p 95
l	Research and Developments agreements entered into by SRA with third parties	Collaborators and partnerships are listed at p 50
m	Corporate governance practices in place during the Financial Year	Corporate Governance - p 86
n	The rationale for the mix of projects included in the Balanced Portfolio	Strategic Pillar 2, *Annual Investment Plan* - p 22
o	Other matters notified to SRA by the Commonwealth	Not applicable

Expenditure against national research priorities

SRA's total expenditure, including RD&A and non-RD&A spend, for 2021/22 against the National Science and Research Priorities and Rural RD&E Priorities is as follows:

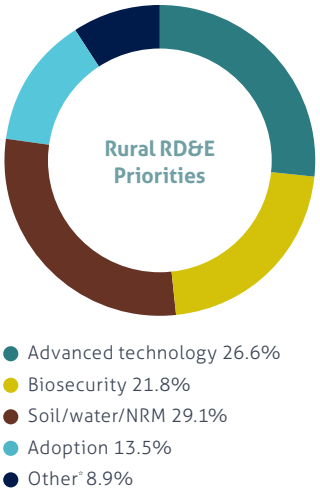
National Science and Research Priorities

NATIONAL SCIENCE AND RESEARCH PRIORITIES [1]	TOTAL INVESTMENT 2021/22	
	ACTUAL	
	($M)	%
1. Food	$19.769	58.9
2. Soil and water	$3.088	9.2
3. Transport	$0.294	0.9
4. Energy	0**	0
5. Advanced manufacturing	$3.715	11.1
6. Environmental change	$2.982	8.9
Other*	$3.689	11.0
Total	**$33.539**	**100**



Rural RD&E Priorities

RURAL RD&E PRIORITIES [2]	TOTAL INVESTMENT 2021/22	
	ACTUAL	
	($M)	%
1. Advanced technology	$18.320	54.6
2. Biosecurity	$5.524	16.5
3. Soil, water and managing natural resources	$4.447	13.3
4. Adoption of R&D	$3.517	10.5
Other*	$1.728	5.2
Total	**$33.539**	**100**



[1] National Science and Research Priorities, Australian Government, 2015

[2] Rural RD&E Priorities, Agricultural Competitiveness White Paper, Australian Government, 2015

*Other includes additional RD&A expenditure related to capacity building, trade and market access, and collaborative research, and non-R&D expenditure including management and administration.

** During 2021/22, SRA invested in several research initiatives that examined diversification and value-adding to sugarcane use. These included feasibility assessments for production of hydrogen and biofuels. These initiatives are reflected as part of the advanced manufacturing initiatives.

Alignment to industry and government priorities

INDUSTRY & GOVERNMENT PRIORITIES	SRA INVESTMENT AREA						
	VARIETY DEVELOPMENT	1. PROFITABLE AND PRODUCTIVE	2. RESILIENT AND ENDURING	3. DIVERSIFIED AND ADAPTABLE	4. WEALTH GENERATING THROUGH LAND STEWARDSHIP	5. SKILLED FOR THE FUTURE	INDUSTRY SERVICES
National Sugarcane Industry RD&E Strategy – Themes[1]							
1. Products: Expanding uses for sugarcane	■		■	■	■	■	■
2. Productivity: Achieving significant productivity gains and increasing adoption	■		■	■	■	■	■
3. Stewardship: Improving environmental performance and industry's social licence		■		■	■	■	■
4. People: Building the capability of industry and research			■	■	■	■	■
National Science and Research Priorities[2]							
1. Food	■		■	■			■
2. Soil and water	■			■		■	■
3. Transport			■			■	
4. Cybersecurity							
5. Energy	■		■	■		■	■
6. Resources			■	■		■	
7. Advanced manufacturing			■	■	■	■	
8. Environmental change	■	■	■	■	■	■	■
9. Health							
SRA Strategic Plan investment areas[3]							
1. Ecosystem leadership		■	■	■	■	■	■
2. Funding and investment	■	■	■	■		■	■
3. World-class innovation practices	■	■	■	■	■	■	■
4. Strengthening our regions	■	■	■	■	■	■	■
5. Next generation innovation platform	■	■	■	■	■	■	■
Queensland Department of Agriculture and Fisheries – Theme Areas for Sugarcane Research Investment[4]							
1. Sugarcane improvement – to improve productivity, quality and production	■	■	■	■		■	■
2. Sugarcane plant protection	■	■		■			■
3. Farming systems broadacre dry land and irrigated, and mixed crop farming systems				■		■	■
4. Soil health		■		■		■	■
5. New market opportunities and processes			■	■		■	■
6. Agri-intelligent systems		■	■	■		■	■
7. Breaking barriers to adoption			■	■		■	■

[1] National Sugarcane Industry RD&E Strategy, 2017

[2] National Science and Research Priorities, Australian Government, 2015

[3] Pillars of Reform within the National Agriculture Innovation Agenda

Queensland Department of Agriculture and Fisheries

SRA and the Queensland Department of Agriculture and Fisheries (DAF) have a Sugar Research and Development Funding Deed in effect until 31 October 2022. The Deed provides funding to SRA for sugar research development activities.

We look forward to soon signing a new Deed for funding through to 2028.

Thirty-eight per cent of research grants (23 of 61 investments) active during 2021/22 received co-funding under the Deed.

In addition, DAF and SRA co-funded seven benefit-cost analyses for research initiatives.

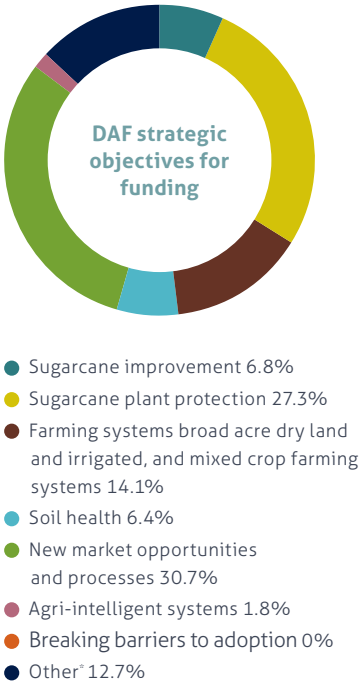
DAF co-funded investments during 2021/22 were:

2017/002	Implementing and validating genomic selection in SRA breeding programs to accelerate improvements in yield, commercial cane sugar, and other key traits
2017/901	Managing Climate Variability – Phase 5 (Forewarned is forearmed)
2018/003	Implementation of root system diagnostics to deliver a field-based measure for root health.
2018/010	Moth borers – how are we going to manage them when they arrive?
2019/901	Smarter Irrigation for Profit Phase 2
2019/903	Australian sugar industry soil health benchmarking in the Central region of Qld - increasing profit and transforming soil health practices through competitive industry research, extension and adoption.
2019/904	Australian sugarcane industry soil health benchmarking in the Wet Tropics region of Queensland – Increasing profit and transforming soil health practices through competitive industry research, extension and adoption.
2019/905	Boosting Diagnostic Capacity for Plant Production Industries
2020/001	Environmental Risk Assessment & Life Cycle Assessment of the Raw Sugar Manufacturing
2020/003	Maximising cane recovery through the development of a harvesting decision-support tool
2020/004	Beyond Imidacloprid - Chemical and Biorational Alternatives for Managing Canegrubs
2020/007	Environmental DNA Technologies and Predictive Modelling for Rapid Detection and Identification of Sugarcane Priority Pests
2020/008	Transformational crop protection – Innovative RNAi biopesticides for management of sugarcane root feeding pests
2020/009	Survey of Australian sugar cane farm business performance 2020-21 and 2021-22
2020/010	Sugar Industry Consultation and Roadmap Development
20219/902 and 2020/011	Biorefineries for Profit - Phase II and III (includes 2019/902 and 2020/011)
2020/013	Oil Canes Part 1: Technical readiness and regulatory assessment
2020/014	Feasibility studies to assess the economic viability of producing hydrogen from bagasse and compostable bioplastic from sugarcane juice
2021/002	Pre-commercial development, testing and validation of RSD LAMP assay for sugar mill roll-out
2021/003	Scoping studies for an integrative digital platform for sustainable sugarcane crop management (CaneMAPPS)
2021/004	Project BGreen
2021/007	Investigating Potential for Sugar Industry Participation in Green Markets
2021/008	Australian Sugarcane Sustainability Framework

Expenditure against Queensland Government investment themes

In 2021/22, SRA and DAF contributed a total of $3.5 million towards co-funded RD&A projects.
This expenditure is presented in the table below against the Queensland Government's investment themes.

DAF STRATEGIC OBJECTIVES FOR FUNDING	TOTAL INVESTMENT 2021/22	
	($M)	%
1. Sugarcane improvement – to improve productivity, quality and production	0.23	6.8
2. Sugarcane plant protection	0.95	27.3
3. Farming systems broadacre dry land and irrigated, and mixed crop farming systems	0.49	14.1
4. Soil health	0.22	6.4
5. New market opportunities and processes	1.07	30.7
6. Agri-intelligent systems	0.06	1.8
7. Breaking barriers to adoption	0.0	0
Other*	0.45	12.9
Total	**3.5**	**100**



**Other includes additional RD&A expenditure related to projects such as the Sugarcane Farm Business Survey, SRA-DAF Funding Agreement Review, and SRA's contribution towards Agricultural Innovation Australia.*

RDC 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 2021/22.

RDC indicators

Indicator	Measure	Purpose	Performance		
Return on investment of RDC expenditure	Benefit Cost Ratio (over 30-year period) (weighted average of BCAs completed every two years)	To demonstrate that RD&E expenditure delivers value to key stakeholders (inc. levy payers).	2019/20: 5.6:1 2018-19 baseline RDC average	2020/21: 2.6:1 20 BCAs completed July 2019 – June 2021	2021/22: 5.4:1* 17 BCAs completed July 2020 – June 2022
Economic contribution	Direct and indirect value add ($) and # of full-time equivalents (i.e. jobs created).	To demonstrate the economic contribution of RDC actions/ investments to regional, state and national economies.	Baseline to be reported in 2024.	NA	
Productivity	% change in multifactor productivity over time	To demonstrate that agriculture's productive capacity is improving over time in a multi-faceted way.	Baseline to be reported in 2024.	NA	

Indicator	Measure	Purpose	Performance		
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.	To be reported in 2023.	NA	
Collaboration	# of projects and $ spend on joint or cross RDC projects.	To demonstrate that RDCs are working effectively with each other.	2019/20 baseline: 11 projects	2020/21: 10 projects	2021/22: 9 projects
Capability	# of research qualifications (i.e. PhDs) and post-doctoral fellowships supported by RDCs.	To demonstrate the RDC's contribution to human capital development.	NA	2020/21 (baseline): 10 PhDs 7 post-doctoral fellowships 1 Masters, 4 undergraduate scholarships and 3 bursaries	2021/22: 9 PhDs 4 post-doctoral fellowships, 1 Masters, 4 undergraduate scholarships and 4 bursaries
Service satisfaction	% of RDC levy payers or members who 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.	2019/20: Growers: 56% Millers: 32% Investors/ partners: NA	NA	2021/22: Growers: 67% Millers: 72% Investors/ partners: 80%
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).	In 2021 SRA implemented the SRA *Strategic Plan 2021-2026* that includes five Research Missions each with targeted investments towards delivering outcomes in specific industry-identified areas. Research Mission 4 relates to wealth generation through land stewardship which aims to position the Australian sugarcane industry as leaders in profitability, environmental sustainability and resource-use efficiency. This research mission has been in place for 12 months. In 2021/22 Research Mission 4 included 15 investments targeting outcomes including improving water quality, increasing water use efficiency, and identifying green market opportunities for sugarcane growers. Progress against RM4 is detailed from p 72.		
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?	To demonstrate how the RDCs are contributing to and providing leadership in the area of diversity and inclusion.	SRA's *Strategic Plan 2021-2026*, implemented in 2021, 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. These targets have been in place for 12 months. SRA's progress toward diversity and inclusion objectives are outlined at Strategic Pillar 1 – Strong Foundations from p 15.		

*Benefit-cost ratio includes total present value benefit and cost estimations for some investments because information was not available at the time of publishing.

CORPORATE GOVERNANCE FRAMEWORK

Board of Directors

SRA's Board of Directors is responsible for charting the direction, policies, strategies and financial objectives of the Company.

The Board serves the interests of SRA and its members, as well as other stakeholders including employees, investors, State and Federal Government and the regional community.

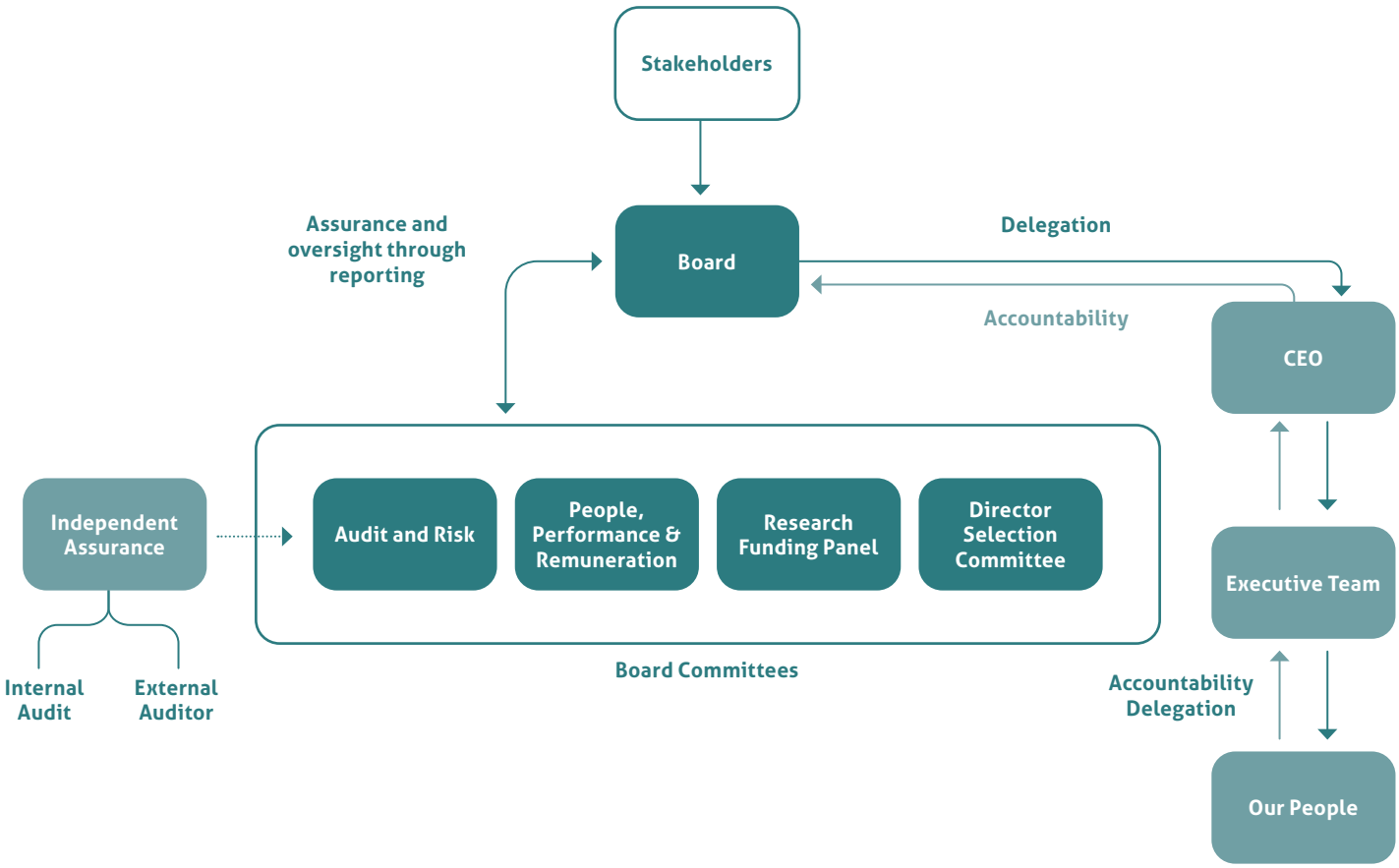
SRA's Board operates in accordance with its charter and has reserved certain powers for itself. The Board has established four standing Committees to assist the Board with effectively discharging its responsibilities:

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

The Board has delegated the day-to-day management of SRA, and the implementation of approved business plans and corporate strategies, to the CEO, who in turn may further delegate to senior management.

SRA's governance framework:

- plays an integral role in helping the business deliver on its strategy
- provides the structure through which strategy and business objectives are set, performance is monitored, and risks are managed
- provides guidance on the standards of behaviour that SRA expects of people
- aligns the flow of information and accountability from our people, through the management levels, to the Board and ultimately our members and key stakeholders.



Board Composition

Under SRA's Board Charter, the composition of the Board is determined having regard to criteria on agreed skills and experience.

The 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. The Board comprises seven directors.

Details of their qualifications and experience is provided under the Board of Directors section of this Annual Report.

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 2021/22 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 2022 Corporate Governance Statement provides detailed information on our corporate governance practices for the year ended 30 June 2022.

It can be viewed at https://sugarresearch.com.au/sugar_files/2022/10/Corporate-Governance-statement-2021-22-F-Digital.pdf

Scan the QR code to view SRA's 2021/22 Corporate Governance Statement

SRA 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 – provides 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.

STATUTORY REPORTS: DIRECTORS' REPORT

For the year ended 30 June 2022

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 2022 ("**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 and Group M 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 2022, there were 9 Group M members and 2,426 Group G members. The total amount the members of the Company are liable to contribute if the Company is wound up for 2021/22 is $4,870.

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

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
- 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.

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 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

It also establishes 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

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 sugar 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, coordinates and invests in research and development activities so as to facilitate dissemination, adoption and commercialisation of results of research and development activities in relation to the Australian sugar industry.

Financial result

The financial result for the reporting period is a $444 thousand surplus (2021: $1,031 thousand loss*), including:

- $319 thousand surplus (2021: $1,222 thousand loss*) from operating activities; and
- $125 thousand (2021: $191 thousand*) of interest income.

** 2021 results have been restated. Refer to note 4 of the notes to financial statements for further information.*

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 Contract 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 new 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 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
- annual performance reporting 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
- 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 operational and strategic 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 operational and strategic 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.

Directors

The names, particulars, qualifications and experience of the Directors of the Company in office during the reporting period and until the date of this report are as follows. Directors and officers were in office for this entire period unless otherwise stated.

DIRECTOR	EXPERIENCE, SPECIAL RESPONSIBILITIES AND INDEPENDENCE STATUS
Ms Rowena McNally *LLB, FAICD, FIML, FRI*	*Appointed as Chair and Director - 21 October 2021* Ms McNally has over 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. Ms McNally has held several chair and board roles in the water, energy and hospital and health sectors. Ms McNally is the Chair of Mercy Community Services SEQ, Mercy Health and Aged Care CQ and Mercy Community Services Nth Qld and Isa Rodeo Limited. Ms McNally is a Fellow of the Australian Institute of Company Directors, the Institute of Managers and Leaders and a Fellow of the Resolution Institute and is a member of the Australian Water Association. Member - Audit and Risk Committee *(appointed 3 November 2021 for meeting on 15 November 2021)* Ex officio Member – Audit and Risk Committee and People, Performance and Remuneration Committee *(appointed 14 December 2021)*
Ms Lindy Hyam *B.Ed, Dip Teach, MBA, FAICD*	*Appointed as Director - 20 October 2016* Ms Hyam 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. Ms Hyam has over 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. Ms Hyam 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. ■ During the reporting period, Ms Hyam served as: Director for Hunter Central Coast AFL; and ■ Presiding Member for Fisheries Research and Development Corporation Selection Committee *(appointed 15 February 2021 until 30 November 2023).* On the 1 July 2021 Ms Hyam took up her appointment as Chair of the Centre of Excellence for Biosecurity Risk Analysis funded by the Australian Commonwealth Government and NZ Ministry for Primary Industries. Ms Hyam was a Fellow of the Australian Institute of Company Directors for 14 years. Chair – People, Performance and Remuneration Committee

DIRECTOR	EXPERIENCE, SPECIAL RESPONSIBILITIES AND INDEPENDENCE STATUS
Mr Sam (Salvatore) Bonanno *B.E. (Mechanical), Adv Dip Business Management, GAICD*	*Appointed as Director - 25 October 2018* Mr. Sam Bonanno is an independent non-executive director with more than 40 years' experience in ports, logistics, infrastructure, mining and agricultural industries in Australia and overseas. Mr Bonanno has experience in strategic planning and implementation, commercial negotiations, business planning, operations management, asset management, project management, materials processing and bulk supply chain management. Mr Bonanno has held four non-executive board positions in Australia—with three key industry-wide service providers and a government corporation for regional economic development—as well as being a director and chair of a global industry association for bulk export coal ports and terminals. Mr. Bonanno is currently serving directorships with: ■ STL - Sugar Terminals Limited; and ■ CQU - Central Queensland University: Member of the Strategic Planning and Projects Committee, University Council. Chair – Audit and Risk Committee
Mr Peter Russo *MAICD*	*Appointed as Director - 25 October 2018* Mr Peter Russo has over 40 years of experience in sugarcane growing and milling. Working in a farming partnership with his two sons in the Childers region, Mr Russo 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. Mr Russo was chairman of the Board of the Isis Central Sugar Mill and has served on the Board since 1990. Mr Russo has served on various committees while on the Isis Central Sugar Mil Board and has also previously been a Board member of St Luke's Anglican School, Bundaberg. Mr Russo is currently serving directorships with: ■ PNR Nuts Pty Ltd. Member – People, Performance and Remuneration Committee *(resigned 14 December 2021)* Member – Audit & Risk Committee *(appointed 14 December 2021)*
Dr Jeremy Burdon *BSc (Hons), PhD, Hon DSc, FAA, FTSE, MAICD*	*Appointed as Director - 24 October 2019* Dr Jeremy Burdon 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. More recently he has served for four years as a member of SRA's Research Funding Panel. Dr Burdon 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 as a non-executive director (March 2022 onward) and was an advisor to the Australian Plant Phenomics Facility. Member – People, Performance and Remuneration Committee Member – Research Funding Panel

DIRECTOR	EXPERIENCE, SPECIAL RESPONSIBILITIES AND INDEPENDENCE STATUS
Mr Mark Day *BAppSC (Mathematics)*	*Appointed as Director - 21 October 2021* Mr Day 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. Mr Day 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. Mr Day 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. He has a degree in Applied Mathematics and has attended Executive programs at Wharton Business School in the USA. Member – Audit & Risk Committee *(appointed 3 November 2021)*
Mr Rowley Winten *B. Ag Science, Grad Dip Business Studies, MAICD*	*Appointed as Director - 21 October 2021* Mr Winten is an international marketing professional with an agronomy background having worked in Australia, Asia Pacific and Europe with over 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. Mr Winten has broad experience in marketing strategy, brand portfolio management, product development, business transformation and change management. Rowley's current focus is on commercialising innovation to drive productivity improvement across cropping systems in Asia Pacific countries to benefit farmers and their communities. Mr Winten has represented industry on a number of national committees. Member – People, Performance & Remuneration Committee *(appointed 14 December 2021)*
Dr Ron Swindells *FIE Aust, FAICD, B.E. (Chem) (Hons), PhD*	*Resigned as Chair of SRA Board and member of Audit and Risk Committee - 21 October 2021* Dr Swindells was a Director of Sugar Research Limited and served as its chairman between 1993 – 2003. He has also been a Director for Mackay Refined Sugars and the Australian Sugar Milling Council as well as an alternate Director of Sugar Australia Ltd and the New Zealand Sugar Company. Dr Swindells has operated at the senior management level in a number of companies including: ▪ Chief executive officer of Mackay Sugar for ten years ▪ Bundaberg Sugar Company as Manager of Millaquin Mill and Bundaberg Refinery. More recently he has worked on a number of sugar-related consulting projects for various clients.

DIRECTOR	EXPERIENCE, SPECIAL RESPONSIBILITIES AND INDEPENDENCE STATUS
Mr Lee Blackburn *GAICD*	*Resigned as Director and member of Audit and Risk Committee - 29 July 2021* Mr Lee Blackburn has been a sugarcane grower for 26 years and has been managing the family farm and harvesting business since 2002. He is chair of Eton Irrigation Scheme PTY LTD, is a director on the boards of Mackay Sugar PTY LTD, Queensland Commodity Services, Mackay Area Productivity Services and Kinchant Dam Water Users Association. He is a former director of Mackay Canegrowers Limited and former member of the Canegrowers Mackay Area Committee.
Dr Guy Roth *B Rural Science (Hons), Masters Applied Science, PhD*	*Resigned as Director and member of Research Funding Panel - 21 October 2021* Dr Guy Roth has extensive experience as a director, executive, and leader in agricultural research, development, and consulting. He has particular expertise in services related to irrigation, water, soil, farming systems and natural resource management for agriculture and rural communities. Dr Roth was formerly the Chief Executive Officer of the Cotton Catchment Communities Cooperative Research Centre and Program Manager for the National Program for Sustainable Irrigation. In 2016 Dr Roth was awarded the Cotton Industry's Researcher of the Year Award. Dr Roth is currently: ■ Director Northern Agriculture with The University of Sydney, Plant Breeding Institute at Narrabri; ■ Chair National Water Use in Agriculture RD&E strategy; and ■ Director – Roth Rural and Regional Pty Ltd.

COMPANY SECRETARY	
Mr Michael Shannon *BA LLB (Hons), GradDipACG, GAICD*	Company Secretary and General Counsel Mr Shannon 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. Mr Shannon specialises in corporations and commercial law, corporate governance, risk and compliance. He is a Solicitor of the Supreme Court of Queensland and a member of the Queensland Law Society, an Associate of the Governance Institute of Australia and a Graduate of the Australian Institute of Company Directors. As SRA's Company Secretary, Michael provides the company secretarial and corporate governance advice to the Chair, the Board, the CEO and the executive management team. As SRA's General Counsel, Mr Shannon is responsible for providing legal advice on all commercial, contractual, intellectual property (IP), procurement and insurance matters and broader legal matters as required.

Insurance of officers

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 2021 TO 30 JUNE 2022						
	Full Board			Board Committees		
	Scheduled	Meetings held between scheduled Board meetings	Total	Audit and Risk	People, Performance and Remuneration	Research Funding Panel
Ms Rowena McNally (Chair)~	4^ [4]	1 [1]	5 [5]	3 [3]	3 [3]	-
Mr Salvatore Bonanno	6 [6]	0 [1]	6 [7]	4^ [4]	-	-
Dr Jeremy Burdon	6 [6]	1 [1]	7 [7]	-	4 [5]	3 [3]
Mr Mark Day~	4 [4]	1 [1]	5 [5]	3 [3]	-	-
Ms Lindy Hyam	6 [6]	1 [1]	7 [7]	-	5^ [5]	-
Mr Peter Russo	6 [6]	0 [1]	6 [7]	2 [2]	3 [4]	-
Mr Rowland Winten~	4 [4]	1 [1]	5 [5]	-	2 [2]	-
Dr Ron Swindells	2^^ [2]	-	2^ [2]	1 [1]	2 [2]^^	-
Dr Guy Roth	2** [2]	-	2 [2]	-	-	-
Mr Lee Blackburn	0*** [0]	-	0 [0]	-	-	-

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 also established a Director Selection Committee which does not comprise any Directors and is comprised of an independent chair and 2 representatives from Group Mmembers and 2 representatives from Group G members. This Committee held 3 meetings during the reporting period. In addition, Ms Rowena McNally attended Board Committee meetings as an ex officio member and in her capacity as SRA Chair following appointment on 21 October 2021.*

~ Commenced as Director following appointment - 21 October 2021

^ Indicates Chair

^^ Dr Swindells resigned as SRA Board Chair & Director - 21 October 2021

*** Dr Roth resigned as Director - 21 October 2021*

**** Mr Blackburn resigned as Director - 29 July 2021*

Company Secretary

Mr Michael Shannon was appointed Company Secretary on 13 January 2014 and continues in the role of Company Secretary as at the date of this report.

Statement of corporate governance

A brief statement of corporate governance is set out in the *Annual Report 2021/22* at p 86 and in further detail as a separate document on the SRA website. These pages form part of this report.

Registered office

50 Meiers Road
Indooroopilly
Qld 4068

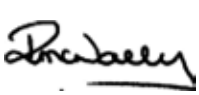
Rounding

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.

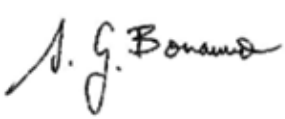
Auditor's independence

The Auditors Independence Declaration in relation to the audit for the year ended 30 June 2022 as required under section 307C of the *Corporations Act 2001* (Cth) has been received by the Company. A copy follows the Financial Statements.

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



Rowena McNally (Chair)
14 October 2022



Sam Bonanno (Director)
14 October 2022

CONTENTS OF STATEMENTS AND NOTES TO THE FINANCIAL STATEMENTS

Statement of profit or loss and other comprehensive income

For the year ended 30 June 2022

	Notes	2022 $'000	2021 $'000 *Restated*
Revenue	*5*	33,542	34,789
Other revenue	*6*	311	445
		33,853	35,234
Employee benefits		16,805	17,340
Operating expenses	*7*	13,940	16,150
Depreciation and amortisation	*8,12,13*	2,789	2,966
		33,534	36,456
Results from operating activities		319	(1,222)
Finance Income		125	191
Profit (Loss) for the year		444	(1,031)
Other comprehensive income		-	-
Total other comprehensive income		-	-
Total comprehensive income		444	(1,031)

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 2022

	Notes	2022 $'000	2021 $'000 Restated
Assets			
Cash and cash equivalents	*9*	29,014	24,009
Trade and other receivables	*11*	2,057	3,928
Prepayments		446	537
Total current assets		31,517	28,474
Property, plant and equipment	*12*	27,640	28,782
Right of Use Asset	*8*	566	669
Intangible assets	*13*	1,121	1,405
Total non current assets		29,327	30,856
Total assets		60,844	59,330
Liabilities			
Trade and other payables	*14*	4,147	2,986
Lease liabilities	*8*	303	311
Employee benefits	*15*	1,961	1,880
Total current liabilities		6,411	5,177
Lease liabilities	*8*	249	351
Employee benefits	*15*	256	318
Total non current liabilities		505	669
Total liabilities		6,916	5,846
Net assets		53,928	53,484
Equity			
Retained earnings		53,928	53,484
Total equity		53,928	53,484

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 2022

	Notes	2022 $'000	2021 $'000 *Restated*
Opening balance	*16*	53,484	53,276
Net effect of prior period adjustment (2020)	*20*	-	1,239
Opening balance - restated		53,484	54,515
Total comprehensive income			
Profit / (Loss)	*16*	444	(144)
Net effect of prior period adjustment (2021)	*20*	-	(887)
Total comprehensive income for the period		444	(1,031)
Closing balance	*16*	53,928	53,484

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 2022

	Notes	2022 $'000	2021 $'000 Restated
Operating activities			
Receipts from Statutory Authority and industry		40,202	41,341
Payments to suppliers and employees		(33,838)	(40,159)
Interest on lease liabilities		-	-
Payments for short-term leases		(168)	(176)
Payments for low value leases		(5)	(4)
Payments for variable lease payments (not included in the measurement of the lease liabilities)		(17)	(5)
Net cash used in operating activities	10	6,173	996
Investing activities			
Interest received		125	191
Payments to acquire property, plant and equipment	12	(737)	(600)
Proceeds from sale of property, plant and equipment		80	45
Payments to acquire intangibles and other long term assets	13	(128)	(58)
Net cash used in investing activities		(660)	(422)
Financing activities			
Payments of lease liabilities		(508)	(536)
Net cash from financing activities		(508)	(536)
Net decrease in cash and cash equivalents		5,005	38
Cash and cash equivalents at beginning of period		24,009	23,971
Cash and cash equivalents at end of period	9	29,014	24,009

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

(*) 2021 receipts and payments were restated to include GST.

Notes to the financial statements

For the year ended 30 June 2022

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 50 Meiers Rd, Indooroopilly, 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.

The prior year financial report was prepared in accordance with Australian Accounting Standards – Reduced Disclosure Requirements. The transition from the previous financial reporting framework to Australian Accounting Standards – Simplified Disclosures has not affected the Company's reported financial position, financial performance and cash flows.

These financial statements were authorised for issue by the Board of Directors on 14 October 2022.

(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 and equipment. 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.

2. Basis of Preparation (continued)

(d) Use of judgement and estimates (continued)

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

The Company has identified readily observable factors to determine whether a contract conveys the right to control the use of an identified asset for a period of time. Once a contract has been identified as having a lease, further analysis is conducted to ensure that it is correctly reflected in the financial statements.

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.

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.

3. Significant accounting policies (continued)

(c) **Revenue from contracts with customers**

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.

However, in accordance with the Australian Accounting Standards Board (AASB) guidance, if these conditions are not met, income is recognised immediately under AASB 1058 - Income of Not-for-Profit Entities.

Management is required to apply a level of judgement to determine whether or not certain contracts are enforceable, and their performance obligations are 'sufficiently specific' to the entity.

As an outcome of such assessment, there might be timing differences in recognising income and expenses, as mandated by applying different accounting standards (AASB 15 vs AASB 1058).

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.

All revenue is stated net of the amount of goods and services tax.

3. Significant accounting policies (continued)

(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.

3. Significant accounting policies (continued)

(g) Financial Instruments (continued)

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.

(h) 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.

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

	2022	2021
• buildings	5 - 40 years	5 - 40 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.

3. Significant accounting policies (continued)

(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 for the current year are as follows:

	2022	2021
• 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.

3. Significant accounting policies (continued)

(j) Impairment (continued)

(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. From 1 July 2019, 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.

The Company has determined that the absence of applying a discount rate will not create a material impact on the measurement and disclosure to the financial statements.

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.

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.

(m) Comparatives

Where necessary, comparative information has been reclassified and repositioned for consistency with current year disclosures. Comparatives have also been restated due to re-assessment of revenue recognition. Refer Note 4.

4. Prior period restatement

During the year the Company has re-assessed their revenue recognition practices to align with the requirements of AASB 15 'Revenue from Contracts with Customers' and AASB 1058 'Income of Not-for-Profit Entities'. This has resulted in a material understatement of revenue in prior periods and an overstatement of revenue in 2021.

The above has been corrected by restating each of the affected financial statement line items for the prior period, as well as opening retained earnings for the earliest period presented (1 July 2020) as follows:

30 June 2021 Comparative year
Restatement of statement of financial position (extract)

	2021 $'000 Initial	Increase / (Decrease) $'000	2021 $'000 Restated
Current assets			
Contract assets	1,459	787	2,246
Total current assets	27,687	787	28,474
Total assets	58,543	787	59,330
Current liabilities			
Contract liabilities	-	436	436
Total current liabilities	4,741	436	5,177
Total liabilities	5,410	436	5,846
Net assets	53,133	351	53,484
Equity			
Retained earnings	53,133	351	53,484
Total equity	53,133	351	53,484

30 June 2021 Comparative year
Restatement of statement of profit or loss and other comprehensive income (extract)

	2021 $'000 Initial	Increase / (Decrease) $'000	2021 $'000 Restated
Revenue			
Queensland government income	3,212	(450)	2,762
Collaboration income	3,994	(1,577)	2,417
Services income	-	1,140	1,140
Total revenue	35,676	(887)	34,789
Results from operating activities	(335)	(887)	(1,222)
Profit (Loss) for the year	(144)	(887)	(1,031)
Total comprehensive income	(144)	(887)	(1,031)

4. Prior period restatement (continued)

1 July 2020 (Comparative year opening balances)
Restatement of statement of financial position (extract)

	2020 $'000 Initial	Increase / (Decrease) $'000	2020 $'000 Restated
Current assets			
Contract assets	-	1,239	1,239
Total current assets	26,320	1,239	27,559
Total assets	59,560	1,239	60,799
Net assets	53,276	1,239	54,515
Equity			
Retained earnings	53,276	1,239	54,515
Total equity	53,276	1,239	54,515

5. Revenue from operating activities

	2022 $'000	2021 $'000 *Restated*
Levy Funds and Matching Payments		
Industry contribution (i)	21,080	21,539
Commonwealth matching contribution (i)	6,789	6,416
Voluntary Contributions		
Queensland government income (iii)	766	2,762
Commonwealth government grant income (ii)	97	-
Collaboration income (iv)	3,549	2,417
Other		
Services Income (v)	693	1,140
Sale of cane	568	515
	33,542	34,789

Restated balances are a result of the re-assessment of revenue recognition. Refer Note 4.

(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. 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 levy is recognised in relation to the harvest season. Revenue from the Commonwealth matching contributions are recognised based on the gazetted Gross Value of Production for the season.

5. Revenue from operating activities (continued)

(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. Any grant income received during the financial year for which conditions have not been fulfilled have been moved to contract liabilities refer note 14.

(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.

Any grant income received during the financial year for which conditions have not been fulfilled have been moved to contract liabilities refer note 14.

The decrease in the revenue recognised from Queensland Government this year is mainly due to a suspension of contracting new projects whilst finalising the extension to the current DAF Funding Deed, which was executed in late December 2021. The Queensland Government grant allocated to SRA for the financial year remains the same, and any unspent funds in 2022 have been carried over to be utilised in future years.

(iv) Collaboration income

Collaboration income are contributions received from third parties where the Company is collaborating with them to achieve project objectives. Any grant income received during the financial year for which conditions have not been fulfilled have been moved to contract liabilities refer note 14.

(v) Services income

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

6. Other revenue

	2022 $'000	2021 $'000
Lease and rental income	166	166
Sundry income	71	253
Profit (loss) on sale of asset	74	26
	311	445

7. Operating expenses

	2022 $'000	2021 $'000
External research expenses	4,337	5,590
Asset and property management	2,126	2,125
Professional and consulting	3,372	4,441
Research expenses	1,009	1,004
Industry consultation	246	141
Registration, subscriptions and licences	577	654
Telecommunications	532	615
Other operating costs	1,741	1,580
	13,940	16,150

8. Leases

During the year ended 30 June 2022, the following was recognised in the profit and loss relating to:

	2022	2021
	$'000	$'000
Income from sub-leases	-	-
Short-term leases	168	176
Low-value leases	5	4
Variable lease payments (not included in the measurement of the lease liability)	17	5
Interest expense on lease liabilities	-	-

RIGHT-OF-USE-ASSETS

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

	Land and buildings	Plant and equipment	Office equipment	Total
	$'000	$'000	$'000	$'000
Balance at 1 July 2020	429	658	36	1,123
Additions	11	110	7	128
Depreciation	(72)	(501)	(9)	(582)
Balance at 30 Jun 2021	368	267	34	669

8. Leases (continued)

LEASE LIABILITIES

	2022 $'000	2021 $'000
Opening Balance	662	1,071
Additions / Modifications	398	128
Interest Expense	-	-
Repayments	(508)	(537)
Closing Balance	552	662
Current	303	311
Non-current	249	351
	552	662

Future lease Payments

	2022 $'000	2021 $'000
not later than one year	303	311
later than one year and not later than five years	249	351
later than five years	-	-
	552	662

9. 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:

	2022 $'000	2021 $'000
Bank balances	3,496	3,520
Call deposits	25,518	20,489
Cash and cash equivalents	29,014	24,009
Cash and cash equivalents in the statement of cash flows	29,014	24,009

Cash and cash equivalents are held with bank and financial institution counterparties, which are rated A-1 or better, based on rating agency Standard and Poor's ratings.

10. Cash flow reconciliation

	2022 $'000	2021 $'000
Profit (Loss) for the period	444	(1,031)
Adjustments for:		
Depreciation and amortisation	2,789	2,966
Impairment loss	-	183
Interest received	(125)	(191)
Profit from sale of property, plant and equipment	(74)	(27)
Change in working capital and provisions:		
Decrease / (Increase) in trade and other receivables, and prepayments	1,960	(878)
Increase in payables	1,160	338
(Decrease) / Increase in provisions for employee benefits	19	(364)
Net cash from operating activities	6,173	996

11. Trade and other receivables

	2022 $'000	2021 $'000 *Restated*
Contract assets	1,707	2,246
Other trade receivables	350	1,682
	2,057	3,928
Current	2,057	3,928
Non-current	-	-
	2,057	3,928

Restated balances are a result of the re-assessment of revenue recognition. Refer Note 4.

12. Property, plant and equipment

	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

	Land and buildings $'000	Plant and equipment $'000	Office equipment $'000	Total $'000
Cost				
Balance at 1 July 2020	25,335	13,950	1,075	40,360
Additions	9	591	-	600
Disposals	-	(49)	(81)	(130)
Balance at 30 June 2021	25,344	14,492	994	40,830
Accumulated depreciation and impairment losses				
Balance at 1 July 2020	(2,280)	(6,886)	(831)	(9,997)
Depreciation for the period	(452)	(1,447)	(80)	(1,979)
Impairment for the period	-	(183)	-	(183)
Disposals	-	30	81	111
Balance at 30 June 2021	(2,732)	(8,486)	(830)	(12,048)
Carrying amounts				
at 1 July 2020	23,055	7,064	244	30,363
at 30 June 2021	22,612	6,006	164	28,782

As at 30 June 2022, $373 thousand (2021: nil) of acquired assets were under construction.

13. Intangible assets

	Software	Intellectual Property	Total
	$'000	$'000	$'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)
Impairment loss	-	-	-
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

	Software	Intellectual Property	Total
	$'000	$'000	$'000
Cost			
Balance at 1 July 2020	2,202	8,900	11,102
Additions	57	-	57
Balance at 30 June 2021	2,259	8,900	11,159
Accumulated amortisation and impairment losses			
Balance at 1 July 2020	(448)	(8,900)	(9,348)
Amortisation for the period	(406)	-	(406)
Balance at 30 June 2021	(854)	(8,900)	(9,754)
Carrying amounts			
at 1 July 2020	1,754	-	1,754
at 30 June 2021	1,405	-	1,405

As at 30 June 2022 there were no intangible assets under construction (2021: nil).

Impairment charge

In the year ended 30 June 2022, there was no impairment charge.

Plant breeders' rights, with a fair value of $8,900 thousand 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 thousand 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.

14. Trade and other payables

	2022 $'000	2021 $'000 *Restated*
Trade payables	814	1,179
Other payables and accrued expenses	1,121	659
Contract liabilities	2,212	1,148
	4,147	2,986
Current	4,147	2,986
Non-current	-	-
	4,147	2,986

Restated balances are a result of the re-assessment of revenue recognition. Refer Note 4

15. Employee benefits

Defined contribution superannuation plans

The Company has paid contributions of $1,428 thousand (30 June 2021: $1,438 thousand) to defined contributions plans on behalf of employees for the reporting period.

	2022 $'000	2021 $'000
Current		
Annual Leave	836	832
Long Service Leave	1,125	1,048
	1,961	1,880
Non Current		
Long Service Leave	256	318
	2,217	2,198

16. Contingencies and commitments

The Company has outstanding milestone commitments of $2,629 thousand as at 30 June 2022 (2021: $6,745 thousand).

17. Capital and reserves

The opening balance and operating loss for FY 2021 have been adjusted by $1,239 thousand and $887 thousand respectively, due to reassessment of revenue recognition. Refer Note 4.

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 2,426 (2021: 2,453) group G members and 9 (2021: 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.

18. Related parties

During the year ended 30 June 2022, the Company did enter into transactions with related parties for a total of $50,000 (2021: $50,000). Also refer to note 20 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 2022 (2021: nil)

19. Audit fees

	2022	2021
Auditor of the company:		
Audit of the financial statements		
BDO	26,377	35,312
Pitcher Partner	35,000	-
Other services (*)	16,650	-
	78,027	35,312
Network firm of the auditor of the company:		
Other services	-	-
	-	-

(*) Other services includes internal cyber security audit

20. Key management personnel compensation

The aggregate compensation made to Directors and members of key management personnel of the Company was $2,957,926 (2021: $2,683,361). When compared to the prior financial year, the increase in FY 2022 is primarily due to redundancy payments made during the financial year.

One of SRA's Directors receive their directors' fees via a Director Service Agreement.

This agreement was between SRA and Winagri Pty Ltd.

21. Events occurring after the reporting date

The financial report was authorised for issue on 14 October 2022 by the Board of Directors.

The Company entered into a contract of sale with an option to lease back on the 17th of August 2022 for the properties at 32 & 50 Meiers Road, Indooroopilly QLD which has subsequently settled on 30 September 2022. The option to lease the property back was exercised, with the property continuing to accommodate SRA staff.

Other than the abovementioned, 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 95 to 116 are in accordance with the Corporations Act 2001, including:

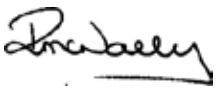
(i) giving a true and fair view of the Company's financial position as at 30 June 2022 and of its performance, for the financial period ended on that date; and

(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 14 October 2022.



Rowena McNally

Director

Lead Auditor's Independence Declaration under Section 307C of the *Corporations Act 2001*

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
50 Meiers Road
INDOOROOPILLY QLD 4068

Auditor's Independence Declaration

In relation to the independent audit for the year ended 30 June 2022, 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
14 October 2022

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

Level 38, 345 Queen Street
Brisbane, QLD 4000

Postal address
GPO Box 1144
Brisbane, QLD 4001

p. +61 7 3222 8444

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 2022, 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 2022 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 2022, 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.

PITCHER PARTNERS

Level 38, 345 Queen Street
Brisbane, QLD 4000

Postal address
GPO Box 1144
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p. +61 7 3222 8444

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.

PITCHER PARTNERS

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- 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
14 October 2022

Appendix

ANNUAL REPORTING COMPLIANCE CHECKLIST

The following checklist shows SRA's compliance with key annual reporting requirements completed during the 2021/22 financial year 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 2020/21 FINANCIAL YEAR
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 2021/22 pp 86 - 94* includes a report on the operations of each Committee; and *Annual Report 2021/22* includes a report on the operations of the SRA Code of Conduct. Further information is provided in the separate Corporate Governance Statement available on the SRA website.
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 AGM after the end of the financial year; and ■ four (4) months after the end of the financial year.	*Annual Report 2021/22 pp 88 - 121* 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 24 October 2022 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 2021/22* to be presented to AGM scheduled for 21 November 2022.

ANNUAL REPORTING REQUIREMENTS	WHAT SRA DELIVERED 2020/21 FINANCIAL YEAR
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 2021/22* 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 it public website by 31 October 2022, a copy of its Annual Report 2021/22	*Annual Report 2021/22* to be published on SRA website by 31 October 2022. *Requirements of the SFC relating to the Annual Report are addressed on* p 80.

Sugar Research Australia Limited
ABN 16 163 670 068

Brisbane Office 50 Meiers Road, Indooroopilly QLD 4068 Australia
Postal Address PO Box 86 Indooroopilly QLD 4068 Australia

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