Sugar Research Australia®

SUGAR RESEARCH AUSTRALIA LIMITED

ANNUAL OPERATIONAL PLAN

2019/20

CONTENTS

Sugar Research Australia Limited

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

Acknowledgements

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

Australian Government
Department of Agriculture

Queensland Government

ISSN: 2206-5520 (Online) © Copyright 2019 by Sugar Research Australia Limited. All rights reserved. No part of the *Annual Operational Plan 2019/20* (this publication), may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of Sugar Research Australia Ltd. **Disclaimer:** In this disclaimer a reference to 'SRA', 'we', 'us' or 'our' means Sugar Research Australia Limited and our directors, officers, agents and employees. Although we do our very best to present information that is correct and accurate, we make no warranties, guarantees or representations about the suitability, reliability, currency or accuracy of the information we present in this publication, for any purposes. Subject to any terms implied by law and which cannot be excluded, we accept no responsibility for any loss, damage, cost or expense incurred by you as a result of the use of, or reliance on, any materials and information appearing in this publication. You, the user, accept sole responsibility and risk associated with the use and results of the information appearing in this publication, and you agree that we will not be liable for any loss or damage whatsoever (including through negligence) arising out of, or in connection with the use of this publication. We recommend that you contact our staff before acting on any information provided in this publication. **Warning:** Our tests, inspections and recommendations should not be relied on without further, independent inquiries. They may not be accurate, complete or applicable for your particular needs for many reasons, including (for example) SRA being unaware of other matters relevant to individual crops, the analysis of unrepresentative samples or the influence of environmental, managerial or other factors on production.

1. MESSAGE FROM THE CHIEF EXECUTIVE OFFICER

I am pleased to present Sugar Research Australia Limited's (SRA's) Annual Operational Plan (AOP) for 2019/20. This AOP directly aligns with SRA's Strategic Plan 2017/18 – 2021/22 and outlines the research, development and adoption (RD&A) activities and investment program SRA will be undertaking during 2019/20 to achieve our strategic goals to drive profitability, improve sustainability, enhance capability and strengthen organisational excellence.

In setting our RD&A agenda for the coming year, SRA's Board and Management recognise there will be several key challenges and potential opportunities for SRA.

Our grower and miller investors are facing significant operating and financial pressures at present, particularly in terms of sustained low world sugar prices, declining production, increasing regulation and maintaining social licence to operate. At the same time, SRA has a responsibility to balance our investor priorities and invest appropriately in RD&A that will mitigate the impact of these pressures and bring positive benefits to the industry and broader communities in which we operate.

SRA is not immune from the challenges faced by our Members and investors and our income will be impacted by these challenges. Effectively managing these pressures whilst delivering impactful RD&A will be challenging given the impact low sugar prices and decline in production will have on SRA's income during the 2019/20 operating period. The SRA Board has reduced our current research investment and internal research capability and is confident that this process will succeed. The Board has therefore endorsed a deficit Budget of $3.1 million for 2019/20 and will utilise a small proportion of our accumulated cash reserves to maintain our RD&A investment portfolio and support activities. We are acutely mindful though that this deficit budget cannot be continued and we have had to make some hard decisions concerning our own operations to mitigate as best we can the impact of the current financial constraints on our frontline RD&A investment and improve the overall operating result. We will continue to implement prudent fiscal management and budget containment measures throughout the coming year, including: implementing improvements to our RD&A investment framework and processes; closely monitoring and evaluating our resourcing levels; exploring additional funding opportunities; streamlining our core RD&A and support functions wherever possible; and introducing improved business processes and technologies to reduce costs and improve efficiency.

Although financial pressures prevail, our focus on delivering impact and returns for our investors remains equally strong. To this end, the SRA Board has adopted a targeted approach for new investment in 2019/20, with a specific focus on transformational research, variety development and milling efficiency and technology that will complement our current RD&A portfolio. New projects to be undertaken in 2019/20 include:

- Validation of high throughput phenomics technologies for sugarcane clonal selection;
- Near infra-red (NIR) calibrations for key fibre quality parameters for use in plant breeding measurement systems;
- Strategies to improve mill processing of soft or low-fibre sugarcane varieties;
- Ratoon Stunting Disease (RSD) detection blueprint for use in sugar factories;
- Proof-of-concept for creation of a new tool for real-time, continuous monitoring of harvest losses;
- Development and commercial testing of new technology to eliminate arcing of mill rollers and improve crushing performance; and
- Development of training modules for sugar factory operators.

SRA will also support industry good initiatives through investment in social and scientific research associated with trade and market access and maintaining the Australian sugar industry's social licence to operate, with a focus on the environment and human health/nutrition.

A primary strategy in working towards ongoing financial sustainability for SRA will be the leveraging of our RD&A investment through strategic partnerships, collaborations and business enhancement opportunities where they align with our Strategic Plan and the needs of our investors. This strong collaborative and solutions-focused strategy provides opportunities for SRA to build capacity, facilitate access to new knowledge, attract and leverage additional investment, and extend SRA's standing as a world-class research organisation. Prime examples of where SRA is employing this strategy include:

- Leveraging of investment and capability through the Commonwealth Government's Rural R&D for Profit Programme (Round 4) Biorefineries for Profit – Phase 2 project which is an SRA-led joint Research and Development Corporations' (RDCs') project entailing pilot-scale production of animal feedstock and probiotics; and
- Additional external income secured through the Commonwealth Government's Reef Trust and the Great Barrier Reef Foundation to undertake the Cane to Creek 2.0 project which expands on two successful water quality projects that have been running in the Wet Tropics under the direction of SRA.

SRA will also be collaborating with the milling sector to establish a long-term milling RD&A investment program, with a focus on improving milling efficiency and capital utilisation, and will also be continuing investment in the Small Milling Research Program (SMRP) scheme which provides a vehicle for targeted investment in small milling sector projects that develop a product, service or process that will deliver tangible outputs with almost immediate outcomes for our miller investors.

SRA will also continue to invest in sugarcane industry capability and innovation through a number of initiatives, including: the development of a Sugarcane Industry RD&A Employment and Capability Strategy; Next Crop leadership development program; SRA Sugar Industry Research Awards; SRA Postgraduate Research Scholarships; Travel and Learning Awards; and the Innovation Catalyst program for SRA researchers. These award programs help researchers to undertake projects to test novel ideas that could lead to further research activity or directly contribute to productivity, profitability and sustainability outcomes for sugarcane growers and millers. Projects funded under these programs for 2019/20 include:

- Characterising nitrogen use efficiency in sugarcane;
- New approaches to quantifying nitrogen fluxes in enhanced efficiency fertilisers;
- Innovative techniques to coat the basecutter blades of harvesters to reduce wear; and
- Developing a marker system to measure dosage of alleles for use as a selection tool in the sugarcane breeding program.

Our expanded Adoption team will continue to provide a vital conduit between research outputs and sugarcane growers and millers, and will continue to collaborate with industry and private sector extension providers on the ongoing delivery of the industry-led adoption strategy.

We will also ensure that we continue to set the internal conditions to support RD&A delivery. This means continuing to develop an investor-centric and performance driven culture, with systems and processes in place to support our people to achieve SRA's strategic objectives. It also requires ongoing investment in breakthrough scientific and digital technologies to ensure our ways of working continue to evolve to take advantage of new opportunities as and when they present.

Although SRA faces a challenging year ahead, we look forward to working with our investors, research and adoption partners and industry stakeholders to effectively deliver our RD&A portfolio and achieve valued return on investment and positive impact on the profitability, sustainability and capability of the Australian sugarcane industry.

Neil Fisher
CHIEF EXECUTIVE OFFICER

2. INTRODUCTION

SRA is a sugarcane grower and miller owned company and the declared Industry Services Body for the Australian sugarcane industry under the *Sugar Research and Development Services Act 2013* (Cth).

As the declared Industry Services Body, SRA is required to provide and manage RD&A activities for the benefit of the sugarcane industry and for the wider public good.

The objectives of SRA are to:

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

To ensure our objectives are achieved, we maintain a strong presence across the main sugarcane growing regions of New South Wales (NSW) and Queensland, with approximately 150 full-time employees based at nine research farms, laboratories and offices.

To fulfil our responsibilities, SRA operates a contestable investment program that encourages sugarcane researchers and research organisations from the broader research community and other sectors, to investigate and create innovative solutions to address sugarcane industry challenges and opportunities.

SRA also undertakes core research activities that are crucial to the future of the Australian sugarcane industry, including activities in plant breeding and biosecurity.

Through the efforts of our own researchers and our research partners, SRA plans to invest $39.5 million in RD&A activities during 2019/20. These activities will be funded through statutory levy payments from sugarcane growers and millers (forecast $22.1 million in 2019/20), co-investment from both the Commonwealth Government (forecast $6.3 million in 2019/20) and Queensland Government (forecast $3.1 million in 2019/20) and collaborative investment from other research providers and private sector partners, as well as through other commercial activities.

With respect to managing and investing funds from levy payers and government investors, SRA has established a strategic management and planning framework that includes the development and delivery of a five-year Strategic Plan and AOPs for each year covered by the Strategic Plan. These planning documents are industry and outcomes focused and respond to current and emerging issues and opportunities and the RD&A needs and expectations of SRA's investors.

This AOP outlines the direction and resourcing for SRA's core activities and investments in RD&A projects (both as an investor and as a provider) to be undertaken during 2019/20, to deliver on SRA's 2017/18 – 2021/22 Strategic Plan and optimise economic, environmental and social benefits for SRA's industry and government investors. This AOP should be read in conjunction with the Strategic Plan.

In delivering on this AOP, SRA will continue to collaborate with its Members, levy payers, industry representative bodies, government, productivity services, extension providers, other industry stakeholders, researchers and international peers and partners. SRA also intends to leverage synergies and opportunities with other RDCs to address cross-sectoral issues impacting agricultural industries and identify and improve access to leading-edge innovation, best-practice and technological advancements.

3. STRATEGIC AGENDA

SRA'S STRATEGIC FRAMEWORK

SRA's strategic agenda is set out in SRA's five-year Strategic Plan and is structured to address the primary profitability, sustainability and capability challenges and opportunities facing SRA's industry investors (Australia's sugarcane growers and millers) and of significance to SRA's government investors (the Commonwealth and Queensland Governments). A summary of SRA's strategic framework is shown in Figure 1.

SRA has four overarching goals that drive the research agenda and ensure we never lose focus on our industry and government investor needs and expectations. These goals are as follows:

1. ***Drive profitability*** – through innovation-led productivity gains, step-change and value-adding;
2. ***Improve sustainability*** – through evidence-based research and sustainable production, biosecurity and environmental management;
3. ***Enhance capability*** – through strengthened research and industry partnerships, capability development programs and collaborative knowledge transfer and adoption mechanisms; and
4. ***Strengthen organisational excellence*** – through enhanced RD&A investment management, best practice organisational governance and a positive performance-focused organisational culture.

To deliver on these strategic goals, SRA has established nine key focus areas (KFAs) – each with set objectives, outputs, expected outcomes and measures by which to demonstrate success.

SRA has also established the following suite of enabling strategies to underpin delivery of our goals across the KFAs and ensure we set the requisite internal conditions to achieve the greatest impact from our RD&A portfolio.

- ***Mapping the future*** – keeping abreast of and responding to current and emerging trends, issues and opportunities;
- ***Sustaining financial viability*** – achieving and maintaining a sustainable financial position for SRA;
- ***Partnering for impact*** – establishing new and strengthening existing partnerships to optimise RD&A outcomes;
- ***Innovating our science*** – fostering innovation, identifying transformative opportunities, adopting new technologies and enhancing capabilities;
- ***Optimising return on investment*** – enhancing our investment decision-making and governance processes; and
- ***Transforming our business culture*** – fostering a more agile operating model and supporting our people, leadership and capability.

Initiatives to support these strategic goals and enabling strategies are included in the key deliverables set out in this AOP and, at a more tactical level, in SRA's internal Organisational Plan.

FIGURE 1: SRA'S STRATEGIC FRAMEWORK FOR DELIVERING VALUED SUGARCANE RD&A

Who we are	SRA is Australia's specialist sugarcane research organisation			
Why we exist	Enabling Australia's sugarcane industry to be profitable, sustainable and resilient			
What we do	We invest in evidence-based research, development and adoption activities to meet industry challenges and opportunities			
Our goals	Drive profitability	Improve sustainability	Enhance capability	Strengthen organisational excellence
Our key focus areas	**Outcomes**		**Priorities** (Incorporated into programs)	
KFA1: Optimally-adapted varieties, plant breeding and release	**Increased sugarcane yield and commercial cane sugar (CCS)**		**Restructure and modernise the breeding program and broaden the genetic base**	
KFA2: Soil health, nutrient management and environmental sustainability	**Better soil health, reduced nutrient losses and improved water quality**		**Integrated and focused soil health program and enhance SIX EASY STEPS guidelines and nitrogen management**	
KFA3: Pest, disease and weed management	**Reduced or avoided yield losses and/or added input costs**		**Integrated new precision technologies and activities on a cost/benefit basis**	
KFA4: Farming systems and harvesting	**Improved farm input-output efficiencies and profitability**		**Economic analyses and demonstration of new or improved technology, farm management practices and analysis tools**	
KFA5: Milling efficiency and technology	**Optimised production, improved capital utilisation and waste minimisation**		**Enhanced capability and new technology for improving processing and energy efficiency**	
KFA6: Product diversification and value addition	**Diversified revenue streams and product innovation**		**Prioritised diversification opportunities for further R&D activity or market analysis**	
KFA7: Knowledge and technology transfer and adoption	**Accelerated adoption of new technology and practice change**		**New strategy targeting industry needs, problems and solutions**	
KFA8: Collaboration and capability development	**Enhanced industry and research capability and capacity**		**Leveraged industry, government and research partnerships and enhanced human capability programs**	
KFA9: Organisational effectiveness	**Increased investor satisfaction and returns on investment**		**Embedded investor and perfomance-centric culture**	
Our enablers	Mapping the future	Sustaining financial viability	Partnering for impact	
	Innovating our science	Optimising return on investment	Transforming our business and culture	
Our measures of success	Increased profitability per tonne of sugarcane produced or processed	Improved industry sustainability	High-impact return on investment	

RD&A PRIORITIES

The ethos that underpins both SRA's Strategic Plan and this AOP is one that is outcome and investor focused, consultative and collaborative. SRA is committed to listening to our investors, understanding their needs and responding to these needs through innovative R&D solutions that are successfully adopted and deliver significant value for the industry as-a-whole, as well as benefits for the broader Australian community.

The key deliverables laid out in this AOP respond to the priority challenges and opportunities of the sugarcane industry and, more broadly, the priorities of the agricultural sector, government and the wider Australian public. More specifically, the KFAs and associated RD&A activities respond to the issues raised during consultation with industry, government and researchers, as well as the principles, strategies and priorities set out in the following strategic documents:

- *National Sugarcane Industry Research, Development and Extension (RD&E) Strategy*, 2017;
- *National Science and Research Priorities*, Australian Government, 2015;
- *Rural RD&E Priorities*, Australian Government, 2015; and
- *Department Strategic Objectives for funding projects for SUGARCANE*, Queensland Department of Agriculture and Fisheries, 2018.

There is strong alignment across these priorities, particularly with respect to: delivering value for money; increasing profitability and productivity; enhancing environmental sustainability; advancing innovation; and improving adoption of R&D. A matrix detailing the alignment between the research programs under each of SRA's KFAs and the key industry and government priorities is provided in Attachment 1.

Figures 2 and 3 detail the proportion of SRA's estimated investment for 2019/20 that align with the National Science and Research Priorities and the Rural RD&E Priorities.

FIGURE 2: SCIENCE AND RESEARCH PRIORITIES[1]

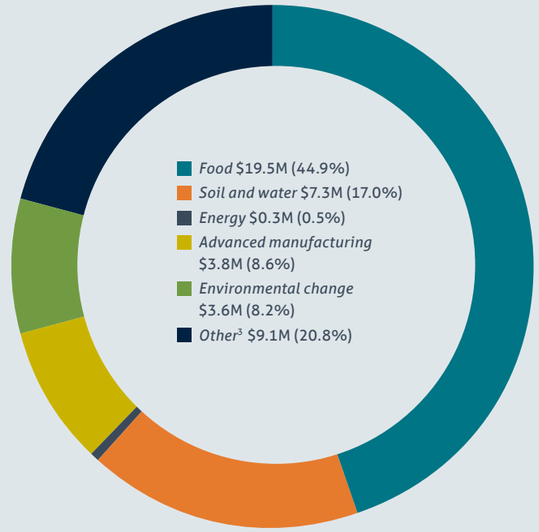
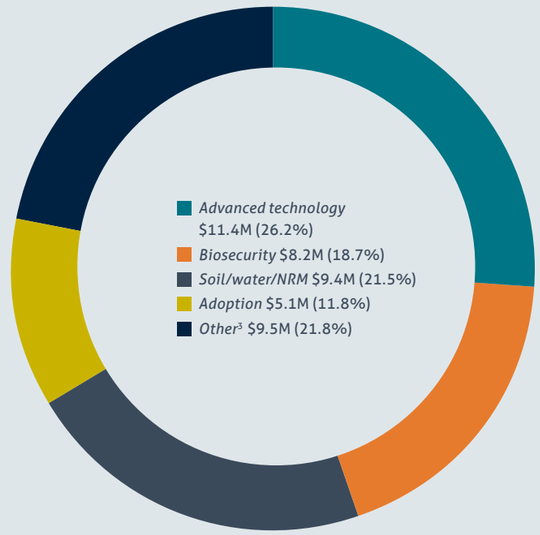


FIGURE 3: RURAL RD&E PRIORITIES[2]



[1] *National Science and Research Priorities*, Australian Government, 2015.
[2] *Rural RD&E Priorities, Agricultural Competitiveness White Paper*, Australian Government, 2015.
[3] Other includes unallocated research, R&D investment management, research stations and corporate support.

These industry and government priorities are key to meeting head on the opportunities and challenges in the sugarcane industry and RD&A today and in the future. In responding to these priorities, SRA has embedded the priorities in all aspects of our operations, including: determining the direction of a project call; forming the primary criteria for investment decisions; and providing targeted areas for measuring SRA's performance and delivery of valued return on investment.

To ensure SRA continues to meet investor priorities and expectations, SRA consults regularly with industry representative bodies and government representatives. These consultations include informal and formal scheduled meetings to discuss RD&A priorities; SRA's investment and research activities; SRA's performance and returns to investors; statutory reporting; levy arrangements; and other matters of mutual interest.

SRA will report on our contribution and achievements against these priorities in our 2019/20 Annual and Performance Reports.

CRITICAL RESEARCH INVESTMENT PRIORITIES

In developing SRA's 2017/18 – 2021/22 Strategic Plan, SRA investors identified a number of industry challenges and opportunities that required priority attention and/or increased investment. The currency and criticality of these research areas was further emphasised during industry consultation to develop regionally-based sugar industry adoption strategic action plans for 2019/20. The priority research investments and deliverables for 2019/20 are as follows:

Modernising plant breeding and broadening genetic base

Varieties are central to helping make the Australian sugarcane industry more productive, sustainable and competitive. SRA's plant breeding program is the primary producer of new varieties in Australia with up to 100,000 potential new varieties developed each year with promising clones progressing through the evaluation stages.

SRA continues to overhaul its plant breeding program with a view to achieving the ambitious target of two per cent annual genetic gain. In 2019/20, SRA will continue with the development of: new pre-breeding selection tools using DNA and unmanned aerial vehicle (UAV) based platforms; a more commercial focus in crossing; a more systematic approach to using wild relatives; earlier selection pressure for key economic traits; increased precision of field trials and screening methods; and improved management metrics.

Enhancing soil health and nutrient management

Soil health includes chemical, physical and biological factors that can be detrimentally impacted by farming practices that reduce organic matter and nutrient levels; allow accumulation of pathogens; maintain long-term monoculture; include aggressive tillage practices; and allow compaction from heavy machinery.

SRA's Soil Health Program invests in, coordinates and delivers RD&A projects that focus on implementing balanced nutrition on-farm with the ultimate aim of optimising productivity and profitability without adversely influencing soil fertility or causing off-farm effects. In 2019/20, the Soil Health Program will include a focus on: accelerating the adoption of best-practice nutrient management using SRA's SIX EASY STEPS; continuing field trials on the effect of Enhanced Efficiency Fertilisers (EEFs) on cane and sugar yield, commercial cane sugar (CCS), nitrogen use efficiency and environmental losses; and understanding root system health.

Strengthening milling sector efficiency and capability

The primary objectives of Australia's sugarcane mills are to maximise throughput of cane and maximise quality sugar output. Innovations in mill technology and processing to assist in the removal of extraneous matter, improve sugar recovery and sugar quality and improve energy efficiency contribute to the long-term sustainability of the milling sector.

In 2019/20, SRA will continue investment that aims to develop products, services or processes that will further optimise milling operations and advance research skills and capacity within the milling sector, including the following projects under the Small Milling Research Program (SMRP) scheme: evaluating the performance of the falling film tube evaporator; evaluating the suitability of the fixed element crystalliser for widespread adoption in Australian sugar factories; addressing operational and maintenance issues with cleated belt intermediate carriers; and reducing surging in shredders.

Facilitating industry led adoption activities

SRA continues to facilitate the implementation of the Strategy for Industry Led Adoption Activities in the Sugar Industry (the Industry Adoption Strategy) that aims to improve the uptake of new and existing technologies and practice change across the Australian sugarcane industry.

In 2019/20, SRA's Adoption unit will continue to work with the newly established Industry Adoption Advisory Committee and Regional Adoption Advisory Groups to deliver regional and cross-regional projects identified and designed to address strategic industry issues. SRA will also continue to facilitate the delivery of collaborative practice change initiatives including Cane to Creek 2.0.

Driving improvements in harvester design and harvesting practices

Harvesting losses are a major cost to the sugar industry; in particular the loss of millable cane via the cleaning system during green cane harvesting. Research conducted into harvester performance has resulted in the development of Harvesting Best Practice (HBP) guidelines to reduce cane loss, improve cane quality, and reduce stool damage.

In 2019/20, SRA will continue to facilitate regional demonstration trials to showcase the significant benefits attributable to the application of HBP and will commence work on the development of a decision support tool that will allow growers and harvesting contractors to determine optimal harvesting parameters. Recognising the need to build capacity and capability in the harvesting sector, SRA will also develop a training and accreditation program to be offered across the industry.

Understanding and managing Yellow Canopy Syndrome (YCS)

YCS is a condition of unknown cause affecting sugarcane crops in Queensland. Sugarcane plants affected by YCS display a specific pattern of leaf yellowing accompanied by abnormal and lethal accumulation of sucrose and starch in leaves.

In 2019/20, the YCS program will continue to draw on Australian and international expertise to: work toward a useful control for YCS that has the potential to be supported by an in-field diagnostic test that is in an advanced stage of development; investigate a number of likely biological entities together with physiological disruptions as potential causes of YCS; and investigate sugarcane variety responses to YCS to develop a much better understanding of different varieties' yield response to YCS, and the severity of impact for different varieties.

Leveraging collaborations and co-investment

SRA recognises the importance of collaborating with a range of partners to improve the efficiency, coordination and leveraging of research investment in areas of mutual interest and where beneficial for the Australian sugarcane industry and the broader public good. Strategic partnerships and joint investment in advanced technologies and agricultural practices are an important part of our investment strategy.

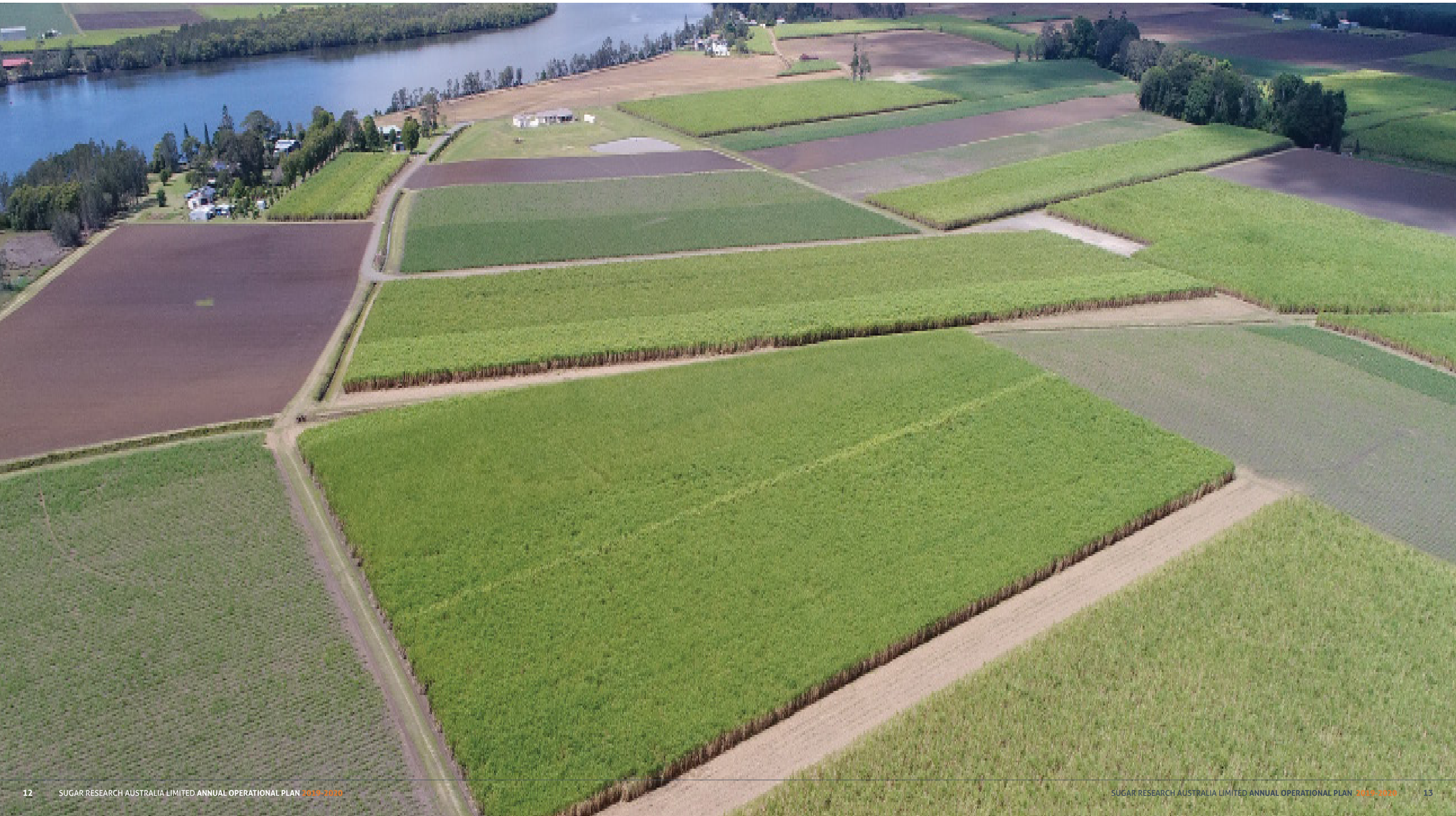
During 2019/20, SRA will seek to expand and strengthen partnerships and collaborative alliances with:

- Leading public research organisations, including universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and government to collectively develop the very best solutions to current industry opportunities and challenges;
- Sugarcane research counterparts overseas to create collaborative research opportunities and variety exchange programs that will benefit the Australian sugarcane industry;
- Private sector partnerships, both nationally and internationally, to catalyse the development and commercialisation of cutting-edge technology and research outputs;
- Productivity services organisations, advisory sector and Natural Resource Management (NRM) organisations to accelerate adoption of research outcomes and new technology;
- Other RDCs to share knowledge and learnings and to co-invest in cross-sectoral research programs; and
- Non-traditional partners to advance scientific knowledge, innovation and transformational change.

Supporting industry good initiatives

SRA is conscious of the current and emerging pressures facing industry with respect to maintaining social licence to operate and competing in a world market where market forces are strongly influenced by the trade actions of the world's largest producers, namely Brazil and India. SRA currently supports the Australian sugarcane industry to address some of these challenges through scientific based research directed at improving soil nutrition, water quality and environmental management, as well as investing in the development of an econometric model to support the industry's trade and market access activities. In 2019/20, SRA will continue to support research projects towards addressing these 'industry good' pressures, along with social and scientific research into sugar nutrition aspects of human health.

4. DELIVERABLES FOR 2019/20



KFA1: Optimally adapted varieties, plant breeding and release

OUTCOMES

Restructure and modernise the breeding program and broaden the genetic base

PRIORITIES
(INCORPORATED INTO PROGRAMS)

Increased sugarcane yield and commercial cane sugar (CCS)

Key Focus Area 1 includes SRA's core sugarcane plant-breeding program for the production of new and improved sugarcane varieties and their release and distribution for commercial production. In addition, KFA1's contestable investment portfolio is aimed at developing tools, technologies and platforms to enable the breeding program to develop those varieties including the exploration and creation of new genetic diversity and improved genome and trait knowledge.

KEY IMPACTS

PROFITABILITY
Increased profitability through more productive varieties that are better aligned to specific regional and farm conditions, greater yielding (tonnes or CCS) and/or less input intensive.

SUSTAINABILITY
Enhanced sustainability through innovative sugarcane varieties bred with key traits requiring less chemical and energy inputs, optimally suited to their local environment and with greater resilience to climatic conditions.

CAPABILITY
Increased capability through a highly efficient plant breeding program, with cutting-edge technology, and improved programs for delivery and grower-selection of varieties.

INDUSTRY

ORGANISATIONAL EXCELLENCE
Enhanced organisational excellence through more streamlined and timely variety development process.

SRA

Peter Hackett

Central Region grower **Peter Hackett** has always had a keen interest in new varieties making their way through the development pipeline, which is why he has continued to host Final Assessment Trials (FATs) on his property for the last 12 years.

"My farm is a fairly average soil type for the district and it was unirrigated at that time I started with the trials, so I thought the information coming from this trial would be useful for the rest of the growers in the Plane Creek area," he said.

"12 years later and we are still going. It continues to be interesting to observe the trials from the high rise spray tractor and see how much variation there is between different clones."

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA1/KPI1	A 2% genetic gain per annum, as measured by FAT test clone performance.	Continue implementation of plant breeding initiatives developed to focus the crossing program, increase effective population sizes, increase early generation selection pressure, improve trial precision, and fast-track promising clones.
KFA1/KPI2	A 12% increase in varietal performance over 10 years.	
KFA1/KPI3	SRA's breeding program utilises molecular markers in selection by 2022.	Conduct pilot testing of selection using Single Nucleotide Polymorphism (SNP) markers for smut resistance in a range of seedling populations.
FORECAST 2019/20 INVESTMENT BUDGET – $13.0M		

PRIORITIES FOR 2019/20
Continued implementation of change management plan for enhancing SRA's core plant breeding operations and increasing rates of genetic gain.
Complete the establishment of the introgression breeding pipeline including cytogenetic characterisation of elite clones.
Pilot test the use of molecular markers for smut resistance in a range of seedling populations.
Establish yield trials for the first crosses selected for accelerated breeding strategies.
Conduct extensive fibre quality testing to support the development of Near Infra-Red (NIR) calibrations for shear strength, short fibre and impact resistance.

OUTPUTS FOR 2019/20		TIMEFRAME
Exploring and Creating Genetic Diversity: enriching the parental gene bank to enhance cane production, protection and sustainability.		
KFA1/DEL1	Evaluation of introgression derived clones in the two-year cropping cycle of temperate cane growing environments of NSW and in response to frost.	May-20
New selection tools: improved methods for earlier, faster and refined parent and progeny selection.		
KFA1/DEL2	Preliminary estimates of accuracy of genomic selection for yield (tonnes of cane per hectare) and CCS.	Jul-19
KFA1/DEL3	Strategy for integrating genomic selection into breeding program.	Dec-19
KFA1/DEL4	Development of a genetic map and disease phenotyping for high value breeding cross ($Q208^{(f)}$ x $Q209^{(f)}$).	Jun-20
KFA1/DEL5	*S spontaneum* chromosome 5 isolated, sequenced and specific markers linked to Pachymetra resistance quantitative trait loci identified.	May-20
Trait R&D: improving genome and trait knowledge to reduce genotype-phenotype gap.		
KFA1/DEL6	Web-based sugarcane Knetminer database linking all publicly available genomic, transcriptomic, proteomic data plus relevant literature, allowing the identification of gene networks associated with traits.	Sep-19
KFA1/DEL7	Data on varietal differences in the ability of roots to grow in compacted soils from both pot experiments and field sites.	Feb-20
KFA1/DEL8	Data obtained for third ratoon stool architecture and associated biochemical markers, in a broad spectrum of varieties.	Apr-20
Plant Breeding: core sugarcane variety crossing and selection program.		
KFA1/DEL9	Parent selection and crossing to develop larger and improved breeding populations.	Ongoing
KFA1/DEL10	Development and evaluation of introgression derived clones with a focus on ratoon crop performance.	Ongoing
KFA1/DEL11	Assessment of germplasm through the three stages of the selection program in all regions.	Ongoing
KFA1/DEL12	Disease screening of breeding clones including earlier stage selection for Pachymetra resistance.	Ongoing
KFA1/DEL13	Robust experimental design and data analysis applied to maximise the precision of breeding and disease screening trials.	Ongoing
KFA1/DEL14	Performance data on potential new varieties provided to Regional Variety Committees for commercial release decisions.	Ongoing
Variety Release and Commercialisation: facilitated distribution of varieties and varietal information for commercial production.		
KFA1/DEL15	Plant Breeder's Rights (PBR) secured for new commercial varieties.	Ongoing
KFA1/DEL16	Redevelopment of QCANESelect® as the key tool for growers to select varieties.	Ongoing
KFA1/DEL17	Publication of regional variety guides with improvements including confidence intervals for smut resistance ratings and inclusion of herbicide phytotoxicity data for new and established varieties.	Ongoing
KFA1/DEL18	Clean planting material of established and new varieties provided to industry through conventional propagation and tissue culture.	Ongoing
KFA1/DEL19	Provision of mill area statistics and varietal composition published data and ongoing data analysis support industry.	Ongoing

KFA2: Soil health, nutrient management and sustainability

OUTCOMES

Improved natural resource health

PRIORITIES

(INCORPORATED INTO PROGRAMS)

Integrated and focused soil health program and improved nutrient management through enhanced SIX EASY STEPS guidelines

Key Focus Area 2 contains SRA's RD&A investments concerned with improving soil health, management of nutrients and chemical inputs, capability to predict and adapt to variable climatic conditions and the industry's environmental sustainability and social licence to farm. The focus area houses SRA's dedicated Soil Health Program, charged with the coordination and delivery of the long-term investment needed to research and develop solutions to the industry's soil-based constraints.

KEY IMPACTS

PROFITABILITY

Safeguarded and improved profitability through farming systems that optimise inputs (particularly nutrients, water and energy) and enhance soil health to support sustainable sugarcane production.

SUSTAINABILITY

Maintained industry social licence to operate and enhanced sustainability through increased uptake of technology and proven practices that optimise input use, improve natural resource health and minimise off-farm impacts.

CAPABILITY

Increased capability through appropriate and timely evidence-based knowledge transfer between researchers, industry, investors and the advisory sector.

INDUSTRY

ORGANISATIONAL EXCELLENCE

Enhanced organisational excellence through established regional networks, as well as collaborative partnerships and communication processes that identify and respond to regional issues in soil health and farming systems.

SRA

Josh Keith

Rocky Point grower **Josh Keith** is enthusiastic that SIX EASY STEPS guidelines are being created for his district, after having been completed for all other districts.

"I kept hearing that when people use SIX EASY STEPS they are saving money and are more profitable," Josh said. "So, I thought: that's what I want."

Some of the SIX EASY STEPS team has been in the region recently, digging 11 soil pits and collecting samples on a range of different soil types and conditions. This information will be used to create a soils booklet for the district and the local SIX EASY STEPS nutrient management guidelines for growers.

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA2/KPI1	Release of updated nitrogen management rec-ommendations by 2020.	Updated recommendations released by June 2020.
KFA2/KPI2	Release of recommendations for the use of Enhanced Efficiency Fertilisers by 2021.	Interim results from EEF trials communicated to participating growers by June 2020.
KFA2/KPI3	90% of growers using SIX EASY STEPS by 2022.	Increase on previous year's result towards 90%.
FORECAST 2019/20 INVESTMENT BUDGET – $4.9M		

PRIORTIES FOR 2019/20
Continue to develop resources that assist in improving the soil physical, chemical and biological properties of sugarcane soils with the view towards improving soil health and the resultant productivity and profitability of the Australian sugar industry.
Continue to improve our understanding of the drivers of nutrient use efficiency and develop tools that assist in strategic and tactical on-farm decision making.
Continue to develop an understanding of the value of EEF as tools to improve productivity and water quality outcomes through industry wide testing and modelling.

OUTPUTS FOR 2019/20		TIMEFRAME
Soil health: improve understanding of soil fertility, soil biology and chemical and physical attributes.		
KFA2/DEL1	Continued development of a soil health hub as an industry resource for the improvement of soil health.	Ongoing
KFA2/DEL2	Baseline population data obtained using DNA-based assays for Pachymetra, parasitic nematodes and a range of soil biological parameters at key soil health project sites, including FAT sites in both the Wet tropics and Central regions.	Jul-19
KFA2/DEL3	Identification of dynamic keystone soil borne fungal communities in response to fallow treatments.	May-20
KFA2/DEL4	Optimised subset of indicators of soil health and impacts of farming practices on soil properties determined.	Nov-19
KFA2/DEL5	Decisions made on a package of relevant DNA-based assays selected for continued application in collaborative trials.	Jan-20
KFA2/DEL6	Optimised and cost-effective field sampling design for estimating root system health.	May-20
KFA2/DEL7	Refinement and calibration of the root DNA health assay for improved assessment of root system health.	May-20
KFA2/DEL8	Two economic case studies completed on long-termed paired transition sites investigating impact of farming systems on soil properties.	May-20
KFA2/DEL9	Preliminary assessment of the impact of additional organic inputs, mixed species fallow cropping and intercropping on soil condition.	May-20
KFA2/DEL10	Extension package developed for soil health field kit.	Nov-19
KFA2/DEL11	Web-based decision support tools and evidence which provides farm-specific guidance to advisors and growers on refining the SIX EASY STEPS recommendations in relation to a range of situations (including case studies), and in which advisors and growers have increased confidence.	Jan-20
Nutrient management: improve management of soil resources, nutrients and chemical inputs to reduce nutrient losses and decrease environmental footprint.		
KFA2/DEL12	Improved understanding of the nitrogen use efficiency of yield-constrained crops and the impact of late harvest and variable climatic conditions presented to the SIX EASY STEPS Advisory Committee and included in the specific nitrogen guideline tables and modelling simulations in the SIX EASY STEPS toolbox.	Jun-20
KFA2/DEL13	Improved understanding of the effects of soil properties and different management practices on mineralisation and nitrification of legume residue nitrogen, including economic assessment of potentially nitrogen-efficient management strategies.	Jun-20
KFA2/DEL14	Improved understanding of EEF management practices on productivity, profitability and nitrogen use efficiency through harvesting, assessment and reestablishment of 60 trial sites across sugarcane regions.	Jun-20
KFA2/DEL15	Basis for prototype smartphone app developed and linked to web-based NutriCalc for decision-making on crop nutrition.	May-20
KFA2/DEL16	Validation and cost effectiveness of an online NIR spectroscopic analysis system to quantify availability of key nutrients in mill by-products.	Jun-20
Climate variability and forecasting: improve capability to predict and adapt to variable climatic conditions.		
KFA2/DEL17	Ongoing industry consultation regarding Bureau of Meteorology (BOM) risk maps for heat, cold and rainfall.	Ongoing
KFA2/DEL18	Impact of climatic conditions and harvest time on crop yields and simulated nitrogen response assessed for major soils in the Herbert region.	May-20
Environmental sustainability and social licence to farm[4].		
KFA2/DEL19	Industry-wide dataset on soil greenhouse gas (GHG) emissions, denitrification and nitrogen use efficiency from sugarcane.	Ongoing
KFA2/DEL20	Ongoing testing and implementation of an extension approach to enhance the adoption of improved pesticide and herbicide practices in the Tully, South Johnston and Mulgrave Mills areas for improved water quality outcomes.	Sep-19
KFA2/DEL21	Feasibility assessment of using sorbents to capture end-of-row chemical and nutrient run-off.	Jun-20

[4] *KFAs 1 to 9 also contain projects that contribute to environmental sustainability and social licence to operate.*

KFA3: Pest, disease and weed management

OUTCOMES

Reduced or avoided yield losses and/or added input costs

PRIORITIES
(INCORPORATED INTO PROGRAMS)

Integrated new precision technologies and activities on a cost/benefit basis

Key Focus Area 3 houses SRA's internal pathological and entomological expertise and capability to diagnose and manage domestic and international biotic threats to the Australian sugarcane industry. The focus area also comprises the portfolio of contestable research and development investment delivering improvements in pest, disease and weed management and SRA's Yellow Canopy Syndrome (YCS) research portfolio.

KEY IMPACTS

INDUSTRY

PROFITABILITY
Safeguarded and increased profitability through reduced or avoided losses (yield losses and/or added input costs) due to prevented, eliminated or reduced weeds, pests and biosecurity incursions.

SUSTAINABILITY
Enhanced sustainability through biosecurity protection, reduced reliance on chemical interventions, and pest, disease and weed management strategies with potentially reduced environmental impacts.

CAPABILITY
Increased capability through access to appropriate management resources and expertise in biosecurity, pathology, entomology, diagnostics and weed agronomy.

SRA

ORGANISATIONAL EXCELLENCE
Enhanced organisational excellence through strong relationships with biosecurity agencies, agri-businesses, government and other bodies to ensure SRA researcher knowledge is current and to enable continuous assessment and adoption of new technologies and practices to support biosecurity, pest, disease and weed management RD&A.

Cairns grower **John Ferrando** says biosecurity awareness is crucial for both maintaining a productive crop, and for the long-term sustainability of the industry.

"Feral pigs do lots of damage to the cane here," Mr Ferrando said. "We also know that things can go horribly wrong when there is an incursion of an exotic pest or disease.

"It could take years for the industry to get on top of the problem, or worse, there could be no chemical controls for a new pest – so it is far better that we be vigilant and keep things clean to begin with."

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA3/KPI1	Up-to-date dossiers reflecting current knowledge for high-risk exotic threats, reviewed annually.	Reviewed and updated where appropriate.
KFA3/KPI2	At least 20% of growers adopted new and/ or improved pest management strategies within last five years.	At least 20%.
KFA3/KPI3	At least 2,000 clones from various stages of the selection programs, parents and foreign clones screened annually.	At least 2,000.
FORECAST 2019/20 INVESTMENT BUDGET – $4.2M		

PRIORTIES FOR 2019/20
Maintain expertise and preparedness, both within SRA and the Australian sugar industry, in the event of an exotic incursion.
Continue to evaluate management strategies for Soldier fly including determining the mechanism by which larvae cause damage to sugarcane.
Continue to evaluate new insecticides that could be used as an alternative to imidacloprid for the management of cane grubs.
Continue to research approaches that minimise off-site movement of insecticides and herbicides and where appropriate extend to growers.
Determine the role of insects in the expression of YCS and commence the refinement of management strategies.

OUTPUTS FOR 2019/20		TIMEFRAME
Biosecurity: enhance capacity to manage biosecurity risks.		
KFA3/DEL1	Ongoing biosecurity capacity for the Australian sugarcane industry including provision of technical support to state and federal biosecurity authorities and monitoring of domestic and international pest management issues that may affect the industry.	Ongoing
KFA3/DEL2	Facilitate the import and export of sugarcane varieties to support the breeding of improved sugarcane varieties and minimise risk of introduction of exotic pests and diseases.	Ongoing
KFA3/DEL3	Post entry Quarantine facility run in a compliant manner and foreign sourced genetic material released to the SRA breeding program.	Ongoing
KFA3/DEL4	Modern diagnostics developed for a range of endemic and exotic pathogens of sugarcane.	Ongoing
KFA3/DEL5	Existing insecticide trials harvested in Indonesia and Papua New Guinea (PNG) and new trails established to develop preemptive management strategies to manage exotic moth borers.	Nov-19
KFA3/DEL6	Upgraded diagnostic tests developed for high-impact diseases.	May-20
KFA3/DEL7	Impact of Sugarcane Streak Mosaic Virus (SSMV) and its likely vector identified and diagnostics developed.	Jun-20
Pest control: enhance capability to deal with pests.		
KFA3/DEL8	Provision of ongoing entomological expertise, diagnostic services, recommendations and improved pest management strategies to industry.	Ongoing
KFA3/DEL9	Development of new molecular diagnostic tests for a range of soil related organisms.	Ongoing
KFA3/DEL10	Trials assessing the value of adult control as a mechanism to manage Soldier fly in the Pioneer Valley.	Jun-20
KFA3/DEL11	Trials established to examine the impact of a range of insecticides on Soldier fly larvae.	Jun-20
KFA3/DEL12	Improved understanding of the mechanisms by which Soldier fly larvae damage sugarcane.	Jun-20
KFA3/DEL13	Ongoing field trials to assess the efficacy of new insecticides against greyback and Childers canegrubs.	Jan-20
KFA3/DEL14	Continuing investigation of imidacloprid and herbicide loss minimisation through formulation, adjuvant addition, placement and application.	May-20
Disease management: improve disease management strategies and technologies.		
KFA3/DEL15	Provision of ongoing pathological expertise, diagnostic services, recommendations and improved disease management strategies to industry.	Ongoing
KFA3/DEL16	Ongoing assistance to industry to manage soil-borne diseases caused by Pachymetra root rot and nematodes through provision of soil assays (cost-recovery basis).	Ongoing
KFA3/DEL17	Provision of Ratoon Stunting Disease (RSD) quantitative Polymerase Chain Reaction (qPCR) testing for industry (partial cost-recovery basis).	Ongoing
KFA3/DEL18	Evaluation of the leaf sheath biopsies (LSB) qPCR (LSB-qPCR) diagnostic tool and a decision made on its adoption as the standard RSD diagnostic tool.	Feb-20
KFA3/DEL19	Rapid screening tests for chlorotic streak disease developed and tested.	Ongoing
KFA3/DEL20	Feasibility of a diagnostic service for chlorotic streak disease assessed.	Dec-19
KFA3/DEL21	Work with Biosecurity Queensland to declare area freedom in central region for Fiji Leaf Gall.	Dec-19
KFA3/DEL22	Routine disease screening provided the SRA plant breeding program for a suite of common endemic diseases.	Ongoing
Weed management: improve weed management strategies and technologies.		
KFA3/DEL23	Continued research on approaches that minimise off-site movement of insecticides and herbicides and where appropriate extend to growers.	Ongoing
KFA3/DEL24	Herbicide phytotoxicity ratings ascribed to newly released SRA varieties to allow the informed selection of herbicides for weed control.	Ongoing
KFA3/DEL25	Effect of mill mud or mill ash on herbicide run-off and efficacy defined.	May-20
Yellow canopy syndrome (YCS): investigate causal factor(s) and develop management strategies[5].		
KFA3/DEL26	Prototype diagnostic test kit refined.	Jun-20
KFA3/DEL27	Correlation between YCS and putative pathogens tested using the full suite of diagnostic tools (PCR, sub-culturing, electron microscopy and next generation sequencing).	Aug-19
KFA3/DEL28	Role of insects in the expression of YCS determined and likely candidates identified.	Jun-20
KFA3/DEL29	Causal agent of YCS and its control determined.	Jun-20
KFA3/DEL30	Yield Impacts of YCS assessed.	Jun-20
KFA3/DEL31	Field management options determined for YCS, including the use of different insecticides.	Jun-20
KFA3/DEL32	Differences among cane varieties for YCS measured.	Jun-20
KFA3/DEL33	Syndrome progression on an individual plant definitively described.	Jun-20

[5] Until the cause of YCS is known, the YCS program will be managed by SRA under KFA3 but addressed through KFAs 1 to 4. YCS is not however classified as a pest or disease.

KFA4: Farming systems and harvesting

OUTCOMES

Improved farm input-output efficiencies and profitability

PRIORITIES
(INCORPORATED INTO PROGRAMS)

Economic analyses and demonstration of new or improved technology, farm management practices and analysis tools

Key Focus Area 4 houses SRA's research and development activities dedicated to optimisation of sugarcane farming and harvesting systems. The portfolio encompasses precision agriculture, water management and on-farm energy efficiency research. KFA4 also contains SRA's flagship harvesting best practices (HBP) program which is driving improvements in harvester design and practices with promising industry outcomes emerging from the harvesting groups participating in SRA's demonstration trials.

KEY IMPACTS

INDUSTRY

PROFITABILITY
Increased profitability through optimised sugarcane farming and harvesting practices and industry value chain efficiencies.

SUSTAINABILITY
Optimised sustainable sugarcane production through application of evidence-based farming and harvesting systems that maintain and/or enhance the value of natural capital both on and off farm.

CAPABILITY
Enhanced regional research, grower, harvester and advisory sector capability in improved farming and harvesting systems.

SRA

ORGANISATIONAL EXCELLENCE
Enhanced organisational excellence through application of farming best management practices on SRA stations, establishment of regional collaborations for practical demonstration and case studies, and attraction and retention of researchers, agronomists and adoption officers with on-ground sugarcane knowledge and networks.

Michael Russo

Childers grower and harvesting contractor **Michael Russo** harvests about 105,000 tonnes of cane each year using best practice strategies.

"Some of the main changes have been slowing our ground speed down, changing the parameters on our primary extractor fan and slowing the fan down to suit different field conditions," Michael said.

"This has resulted in much better quality of cane supply going to the mill. For the grower it represents more profit because there's less wastage in the field."

Michael said the changes had resulted in better yields, higher CCS and better ratoonability.

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA4/KPI1	Positive input-output efficiency ratios resulting from adoption of new technology and practices.	Case studies demonstrating research yielding improved farming input-output efficiencies.
KFA4/KPI2	Industry engagement continues regarding demonstration of harvesting best practice.	20 harvesting best practice trials completed with emphasis on Central and Burdekin regions.
FORECAST 2019/20 INVESTMENT BUDGET – $1.3M		

PRIORTIES FOR 2019/20
Continue irrigation efficiency research and develop resources to assist growers to reduce energy costs.
Assess methods by which farming systems can be improved to achieve increased productivity, profitability and sustainability.
Maintain industry focus on the reduction of losses during the harvest process to maximise returns to the whole value chain.

OUTPUTS FOR 2019/20		TIMEFRAME
Water management: improve irrigation and water management.		
KFA4/DEL1	Two additional case studies on energy innovation opportunities in irrigated sugarcane analysed and reported, with fact sheet and extension material.	Dec-19
KFA4/DEL2	Industry 'energy' resource pack completed.	Dec-19
KFA4/DEL3	Industry article on policy setting and incentives for investment in energy published.	May-20
KFA4/DEL4	Information sheets and case studies prepared for seven irrigation innovation hubs.	May-20
Farming systems: improve planting systems; crop performance; crop rotations; and on-farm energy efficiency.		
KFA4/DEL5	Analysis of productivity and economic outcomes of use of ameliorants to improve sub-soil constraints.	Dec-19
KFA4/DEL6	Ongoing investigation of the effect of grain legume crops on productivity and soil biology in the following sugarcane crop.	Jan-20
KFA4/DEL7	Commercial system developed for distribution of satellite imagery products – crop vigour and yield – to mills and growers.	Jan-20
Harvesting systems and cane cleaning: improve technology and identify and demonstrate harvesting best practice.		
KFA4/DEL8	Ongoing collaborative work with industry partners addressing mechanical harvest losses through research, technology and adoption.	Ongoing
KFA4/DEL9	Detailed design for an upscaled non-pneumatic cane cleaner capable of 150 tonnes per hour throughput.	Aug-19
KFA4/DEL10	Comparison of cane loss with four and five blade chopper drums under different operational settings, using a chopper test rig.	Sep-19
KFA4/DEL11	A cane loss measurement system, SCHLOT Live, commercialised and available to industry.	Dec-19
KFA4/DEL12	Dynamic model completed describing the interaction of harvester front-end components and cane stalks.	Mar-20
KFA4/DEL13	Recommendations to incorporate optimised base-cutter geometry and modifications to gathering fronts/forward feed components to enhance gathering and feeding performance, based on data.	Mar-20
KFA4/DEL14	Training program developed and rolled out targeting harvester operators to improve harvest losses.	Jun-20

KFA5: Milling efficiency and technology

OUTCOMES

Optimised production, improved capital utilisation and waste minimisation

PRIORITIES

(INCORPORATED INTO PROGRAMS)

Enhanced capability and new technology for improving processing and energy efficiency

Key Focus Area 5 houses SRA's investments pursuing greater milling process efficiency and utilisation, optimised cane quality and transport and improved sugar quality. The KFA includes SRA's internal near infra-red (NIR) capability supporting Australian millers in the ongoing installation and calibration of Cane, Sugar and Bagasse Analysis Systems and adoption of laboratory and online NIR solutions. KFA5 also includes SRA's Small Milling Research Program providing a vehicle for targeted investment in small milling investor projects that develop a product, service or process that delivers tangible outputs with almost immediate outcomes within the sugar factory.

KEY IMPACTS

INDUSTRY

PROFITABILITY

Increased profitability through reduced costs of production, improved market access due to high quality product and improved capital utilisation.

SUSTAINABILITY

Enhanced sustainability through improved processing and energy efficiencies and waste management strategies.

CAPABILITY

Improved capability of milling technicians and professionals through training, peer-learning and knowledge exchange.

SRA

ORGANISATIONAL EXCELLENCE

Enhanced organisational excellence through establishment of strong relationships and collaborations with milling technicians and professionals.

David Pike

The Isis Central Sugar Mill installed a ProFoss NIR system in 2017 with the help of researchers at SRA.

Production Superintendent with Isis Central Sugar Mill, **David Pike**, said the mill identified that the hardware support for the Direct Light units was at risk, as Foss service contracts for these type of instruments expire at the end of the 2017 season. Isis had been running the Direct Light NIR system since 2007.

"The transition to the ProFoss was quite smooth, but not without some challenges," Mr Pike said. "Our internal IT team had to realign the ProFoss data string with our cane receivals system and we also had some timeout and windows OPC server problems.

"These were resolved quickly by the SRA team and without their ongoing maintenance support of the software and calibration platforms, the new ProFoss NIR system would not function to the level of confidence required for cane payment."

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA5/KPI1	Miller Performance rating for SRA.	69% of millers rate SRA's performance 'high' to 'very high' (representing a 2% year-on-year increase towards an overall 10% improvement by 2022).
KFA5/KPI2	Miller satisfaction with SRA.	Average rating of 4 out of 5.
FORECAST 2019/20 INVESTMENT BUDGET – $1.9M		

PRIORTIES FOR 2019/20
Develop a long-term RD&A Program for milling in collaboration with the milling sector.
Continue investment in Small Milling Research Program.
Complete phase one of NIR calibration development for fibre quality traits for deployment in plant breeding.

OUTPUTS FOR 2019/20		TIMEFRAME
Milling RD&A strategic agenda: enhance milling-related RD&A investment, management and oversight processes.		
KFA5/DEL1	Industry represented Milling Program Steering Committee established to oversee development of a holistic milling RD&A investment program.	Jul-19
KFA5/DEL2	Recommendations on Milling Program presented to SRA Board for commissioning targeted research investment.	Dec-19
Sugar quality: improve sugar quality.		
KFA5/DEL3	Report on novel methods to manage raw sugar quality.	Oct-19
KFA5/DEL4	Finalised analyses of effect of pan boiling techniques on sugar quality.	May-20
Mill operations: improve mill processing efficiency and mill capacity utilisation.		
KFA5/DEL5	Provision of Cane NIR Systems (CAS), Bagasse NIR systems (BAS), Sugar NIR Systems (SAS) and Laboratory NIR solutions to Australian sugar factories.	Ongoing
KFA5/DEL6	NIR calibration development and maintenance for NIR installations in Australian sugar factories.	Ongoing
KFA5/DEL7	Established potential for NIR calibrations to estimate plant available nutrient levels in mill mud.	Jun-20
KFA5/DEL8	Data analysed from 2018 season factory trials of pan design and operation for low pressure vapour, and 2019 trials on four pans completed.	Oct-19
KFA5/DEL9	Computational fluid dynamics (CFD) models developed for batch pans in sugar factories.	Oct-19
KFA5/DEL10	Effect of evaporation operation on factory process streams, sucrose losses and acid formation during the 2018 season determined at four factories.	Dec-19
KFA5/DEL11	First in-factory performance measurements completed of tube coatings and tube materials, chosen for their resistance to erosion and corrosion, installed into boilers.	May-20
KFA5/DEL12	Understanding of the best noxious gas piping arrangement to produce condensate at pH above 6 from all vessels to minimise corrosion and minimise maintenance requirements.	May-20
KFA5/DEL13	Understanding of the effect of juice pH on the condensate pH levels in the evaporator train.	May-20
KFA5/DEL14	Recommendations on performance characteristics and key operational issues associated with installing, operating and maintaining falling film tube evaporators.	May-20
KFA5/DEL15	Recommendations on performance characteristics, operational issues and cost/benefits associated with fixed element crystallisers.	May-20
KFA5/DEL16	Best practice manual for the design, maintenance and operation of cleated belt intermediate carriers.	Jun-20
KFA5/DEL17	A theory of operation of shredder feed rolls and guidelines for their design and setting, which will be made available to all milling companies.	Jun-20
KFA5/DEL18	New technology to eliminate arcing of mill rollers.	Jun-20
Knowledge transfer and adoption: improve extension, communication, information and technology transfer and adoption.		
KFA5/DEL19	Modules for high and low grade fugalling, sugar drying, and cooling crystalliser modules completed in the New Learning Management System for Australian mills.	Dec-19

KFA6: Product diversification and value addition

OUTCOMES

Diversified revenue streams and product innovation

PRIORITIES

(INCORPORATED INTO PROGRAMS)

Prioritised diversification opportunities for further R&D activity or market analysis

Key Focus Area 6 comprises SRA's product diversfication and value addition portfolio. Investment in KFA6 encompasses the identification of new opportunities and uses for sugarcane, economic and market analysis of value-add opportunities and prioritisation of future industry diversification options. The focus area invests in the development of diversification and by-product revenue streams to safeguard enduring industry profitability and sustainability.

KEY IMPACTS

INDUSTRY

PROFITABILITY

Sustained industry profitability secured through diversified sugarcane and sugarcane by-product revenue streams and maximised value addition through product innovation.

SUSTAINABILITY

Enhanced sustainability of industry through diversified product stream, including alternative uses for sugarcane waste.

CAPABILITY

Enhanced capability through access to expanded product and value add opportunities, as well as advanced technologies and modern processing and engineering methods.

SRA

ORGANISATIONAL EXCELLENCE

Enhanced organisational excellence through established effective processes to monitor and assess sugarcane industry diversification opportunities.

Joe Muscat

The topic of product diversification and value addition was a topic of discussion at the industry Futures Forum in 2017. Mackay grower **Joe Muscat** attended the Futures Forum and said that the Australian industry needs to look at different end products.

"Relying on one product is hard," Mr Muscat said. "85 percent of what we produce in sugar goes into the world market and that is a very volatile market.

"We need to do more work on adding value to our commodity. With our input costs always increasing, we have to find ways to manage that and keep a profitable business. I see value adding as an opportunity going forward."

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA6/KPI1	Completion of technical review of diversification opportunities by 2019.	Review complete and communicated to industry by July 2019.
KFA6/KPI2	Identification of new opportunities for product diversification by 2020.	Watching brief on market trends, new products and technology oppor-tunities communicated to SRA investors by June 2020.
KFA6/KPI2	Platform technologies for fuels, chemical and feed evaluated by 2021.	Competed pilot-scale production and feeding trials for animal feedstock and probiotics products by June 2020.
FORECAST 2019/20 INVESTMENT BUDGET – $1.2M		

PRIORTIES FOR 2019/20
Communicate findings and recommendations from in-depth review of diversification options for the Australian sugarcane industry.
Maintain market and technology watch service for identifying diversification opportunities in the Australian sugarcane industry.
Continue development of biorefinery technology and intellectual property (IP) for the production of more digestible animal feed from sugar-cane bagasse and feed probiotics, and advance the technologies toward commercial application.

OUTPUTS FOR 2019/20		TIMEFRAME
Enhancing value: identification of new opportunities for new products or uses for sugarcane.		
KFA6/DEL1	Report on diversification options for Australian sugarcane industry finalised and communicated to growers and millers.	Jul-19
KFA6/DEL2	Watching brief on market trends and diversification opportunities (including bio-fuels, plastics, animal feed, densified biomass) communicated to SRA investors.	Ongoing
KFA6/DEL3	Pilot-scale production of new feed ingredients for feeding trials in monogastric and ruminant animals.	Jun-19
KFA6/DEL4	Scale-up manufacturing and feeding trials of novel probiotics products.	Jun-19

KFA7: Knowledge and technology transfer and adoption

OUTCOMES

Targeted, measurable practice improvement through the increased uptake and implementation of new and existing technologies

PRIORITIES

(INCORPORATED INTO PROGRAMS)

Development of structures and strategies that identify industry needs, priorities and targeted solutions at regional and industry levels

Key Focus Area 7 concentrates on the development and implementation of knowledge transfer and adoption strategies, processes and activities to ensure transfer of research outputs and translation into on-the-ground outcomes. The focus area houses SRA's internal Adoption unit and a contestable research portfolio facilitating specific adoption activities, research to understand and improve knowledge transfer and projects to improve sugarcane farm business, risk management and decision making. KFA7 also encompasses SRA's Communication unit and industry engagement through the delivery of timely and professional publications and other communication across several mediums.

KEY IMPACTS

INDUSTRY

PROFITABILITY

Increased profitability through improved efficiency and optimised production along the value chain.

SUSTAINABILITY

Enhanced sustainability through increased uptake of technology and proven practices that improve natural resource health, reduce inputs and minimise waste.

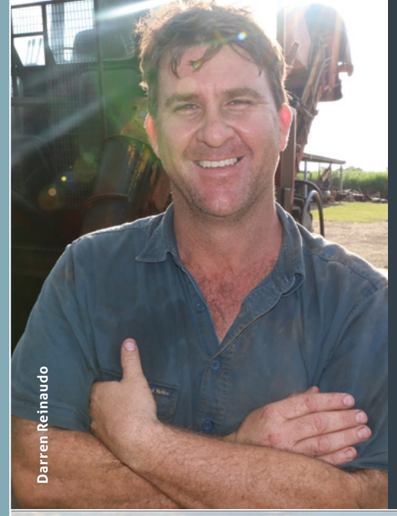
CAPABILITY

Increased capability through appropriate and timely knowledge transfer between researchers, industry and advisory sector.

SRA

ORGANISATIONAL EXCELLENCE

Enhanced organisational excellence through communication processes and leveraged partnerships that ensure effective knowledge transfer and adoption.



Darren Reinaudo

Herbert grower-contractor **Darren Reinaudo** said economics was a core driver of current farming and harvesting practices and growers need hard data from local field trials to determine whether there were financial benefits to changing practices.

"When making the decision to change or improve practices, we need to measure the difference between the existing practice and the recommended practice to understand whether the benefits in one area outweigh the costs in another," Mr Reinaudo said.

"We've participated in a SRA harvesting trial and we're looking forward to working through the economic analysis from that trial. If the data demonstrates that there's a better way, it's important we all work together to improve our situation."

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA7/KPI3	Average grower and miller satisfaction with SRA adoption and communication activities rat-ing of 4 out of 5 achieved by 2022.	Increase on previous year result towards target of 4 out of 5.
KFA7/KPI4	Improved industry adoption outcomes through implementation of the Strategy for Industry Led Adoption Activities.	Industry and regional priority adoption projects identified, developed and implemented.
FORECAST 2019/20 INVESTMENT BUDGET – $6.3M		

PRIORTIES FOR 2019/20
Continue implementation of the *Strategy for Industry Led Adoption Activities in the Sugar Industry* (the *Adoption Strategy*) and accelerated application of technologies and practices which lead to targeted and measurable practice change.
Develop and implement effective extension, education and training initiatives to support adoption of SRA's R&D outputs.
Build industry knowledge on interactions between on-farm practice and water quality in priority Great Barrier Reef catchments.
Engage and inform SRA investors and key stakeholders of SRA's RD&A activities and outcomes in a timely manner.

OUTPUTS FOR 2019/20		TIMEFRAME
Knowledge transfer and adoption: establish a contemporary strategy and regionally-based partnerships to promote awareness and uptake of new research knowledge and technology.		
KFA7/DEL1	Industry-supported and regionally-tailored strategies and plans for collaborative facilitation of technology transfer and practice change.	Ongoing
KFA7/DEL2	Regionally-tailored project-based activities that up-skill growers, millers, advisors and other relevant stakeholders, utilising a range of methods, including in-person, electronic and web-based activities, along with field trials and demonstrations of new technology and practices across regions.	Ongoing
KFA7/DEL3	Coordination, facilitation and support of project-based activities designed to deliver targeted and measurable practice change to enhance industry productivity, profitability and sustainability.	Ongoing
KFA7/DEL4	Suite of technical resources that assist the extension and advisory sector to work with growers and millers to enhance productivity, profitability and sustainability.	Ongoing
KFA7/DEL5	Adoption activity and practice change monitoring and evaluation framework to measure and assess the impact of SRA's adoption activity and research outcomes for growers and millers.	Ongoing
KFA7/DEL6	Delivery of timely communication material across multiple mediums to industry, including CaneConnection and Milling Matters publications, e-newsletters and CaneClips videos.	Ongoing
KFA7/DEL7	Maintain eLibrary with accessibility to research reports, papers and research literature.	Ongoing
KFA7/DEL8	Completion of annual Grower and Miller Surveys.	Aug-19
KFA7/DEL9	Publication and promotion of evidence-based case studies, impact assessments, evaluations and performance reports.	Oct-19
KFA7/DEL10	Platform for growers, researchers and extension advisors to agree on and test potential solutions to better match herbicide, pesticide and nutrient application to growers' specific requirements and monitor associated impacts on water quality in multiple priority catchments of the Great Barrier Reef.	Mar-21
KFA7/DEL11	Evaluation of improvement in pesticide application and management by growers that is attributable to project activities.	Aug-19
KFA7/DEL12	Productivity drivers identified for three milling entities.	May-20

KFA8: Collaboration and capability development

OUTCOMES

Enhanced industry and research capability and capacity

PRIORITIES

(INCORPORATED INTO PROGRAMS)

Leveraged industry, government and research partnerships and enhanced human capability programs

Key Focus Area 8 covers SRA's efforts and investment towards ensuring the Australian sugarcane industry is highly skilled and is supported by a research workforce with the knowledge, capability and capacity to meet current and future industry needs. Through KFA8, SRA also actively invests in 'industry good' collaborative initiatives, such as social and scientific research into social licence to operate and trade policy and market access research, and cross-sectoral collaborations to leverage knowledge and resources, and extend SRA's capacity to deliver value to industry and government investors.

KEY IMPACTS

INDUSTRY

PROFITABILITY

Increased profitability through accelerated innovation resulting from enhanced industry and research capability and capacity.

SUSTAINABILITY

Maintained social licence to operate and derived environmental and social benefits through leveraged investment in cutting-edge cross-sectoral and collaborative RD&A.

CAPABILITY

Increased researcher and industry capability through leveraged expertise and resources and appropriate and timely learning and development programs.

SRA

ORGANISATIONAL EXCELLENCE

Enhanced organisational excellence through proactive engagement and collaboration in researcher, industry and cross-sectoral skill development, innovation and networks.

Chris Lyne

The Next Crop program is a new investment by SRA in industry leadership and capability, starting for the first time in 2019. Through Next Crop, participants undertake a range of leadership and development activities.

Burdekin grower **Chris Lyne** has been one of nine participants in the program and said he was excited to take part.

"The future of the sugar industry depends on strong leadership at a range of levels, and this program is an opportunity to develop these critical skills," Mr Lyne said. "It is a chance to learn with other growers from across the industry and bring our new skills back to our respective regions."

To learn more, visit **nextcropleaders.com.**

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA8/KPI1	SRA participation and investment in relevant collaborative and cross-sectoral programs.	Demonstrated contribution and support in 2019/20.
KFA8/KPI2	Maintain a minimum of four postgraduate scholarships and two research awards each year.	At least four scholarships awarded in 2019/20. At least two research awards granted in 2019/20.
KFA8/KPI3	At least two short-term placements per annum of students and/or professionals in research or industry positions for industry exposure.	At least two placements in 2019/20.
FORECAST 2019/20 INVESTMENT BUDGET – $1.9M		

PRIORITIES FOR 2019/20
Foster, strengthen and extend RD&A partnerships, collaborations and networks to leverage investment, multi-disciplinary capability and multi-institutional resources, and deliver valued impacts for SRA's investors.
Support industry good collaborative social and scientific research aimed at revitalising the Australian sugarcane industry, maintaining the industry's social licence to operate and maintaining the industry's competitive position in the world sugar market.
Continue to build capacity in the sugarcane industry by providing Sugar Industry Research Awards, Postgraduate Research Scholarships, Travel and Learning Awards, and leadership and capability development programs.

OUTPUTS FOR 2019/20		TIMEFRAME
Industry good collaboration.		
KFA8/DEL1	Support industry representative bodies in social and scientific research initiatives concerning the sugarcane industry and its role in health and environmental management.	Ongoing
KFA8/DEL2	Economic model delivered and first simulation runs to underpin trade strategies and market access initiatives.	Jun-20
KFA8/DEL3	Continued implementation and management of the National Sugarcane Industry RD&E Strategy.	Ongoing
KFA8/DEL4	Sugarcane Industry RD&E Employment and Capability Review and Strategy.	Nov-19
Sectoral and cross-sectoral collaboration.		
KFA8/DEL5	Strategic partnerships and alliances, with both traditional and non-traditional research partners (regionally, nationally and internationally), including collaborations with adoption and extension providers, industry productivity services organisations, Commonwealth and Queensland departments, NRM groups, the Australian Research Council (ARC), Cooperative Research Centres (CRCs), non-government organisations and private sector.	Ongoing
KFA8/DEL6	Support and participation in cross-sectoral research and development activities, including joint-RDC collaborations.	Ongoing
KFA8/DEL7	Memorandums of Understanding (MoUs) with other research organisations to exchange knowledge and research material.	Ongoing
Scholarships: enhance research capacity through recognised training.		
KFA8/DEL8	Postgraduate research scholarship program to develop and enhance long-term industry research capacity.	Ongoing
Sugarcane Industry Travel and Learning Awards (STLA): travel and learning to enhance innovation capacity.		
KFA8/DEL9	Travel and learning awards to promote the search and development of new industry research, development and adoption ideas.	Ongoing
Training to enhance qualifications and skills: workshops; Researcher Awards; and leadership.		
KFA8/DEL10	Research award program to develop and enhance long-term industry research, development and adoption.	Ongoing
KFA8/DEL11	Sugar Milling R&D Capability Building Program active at the Queensland University of Technology (QUT) to develop and enhance long-term milling industry capability and three capability appointments made.	Ongoing
KFA8/DEL12	Innovation Catalyst awards providing seed-funding to researchers to discover novel solutions or leads for future funding activity and develop innovative research skill sets.	Ongoing
KFA8/DEL13	Review of Next Crop sugarcane industry leadership program.	Jun-20

KFA9: Organisational effectiveness

OUTCOMES

Increased investor satisfaction and returns on investment

PRIORITIES

(INCORPORATED INTO PROGRAMS)

Embedded investor and performance-centric culture

Key Focus Area 9 covers SRA's RD&A investment management and corporate functions and aims to ensure SRA's strategic and investment framework, governance processes and fiscal, resource and asset management systems and processes can effectively support the delivery of an RD&A investment portfolio that delivers valued impact and returns on investment.

KFA9 includes initiatives to strengthen organisational effectiveness and drive internal operations towards excellence through the ongoing enhancement of SRA's values-based culture and performance-centric processes and systems, with a particular focus on improving investment decision-making and securing financial sustainability with a highly skilled, innovative and engaged workforce.

KEY IMPACTS

INDUSTRY

PROFITABILITY

Industry profitability supported through RD&A investment management that delivers value and positive returns on investment.

SUSTAINABILITY

Industry sustainability supported through investment in and management of evidence-based RD&A portfolio focused on conserving resources, reduc-ing waste generation and environmental management.

CAPABILITY

Support industry capability and maintain research capability through effective attraction, retention and up-skilling of high-calibre research and corporate professionals, and the retention and management of Intellectual Property and corporate knowledge.

SRA

ORGANISATIONAL EXCELLENCE

Enhanced organisational excellence through an RD&A investment portfolio aligned with investor priorities and supported by robust and responsive corporate and governance systems, with highest level of organisational probity, integrity and compliance.

Anne-Louise Slack

To improve workplace health and safety, and staff engagement, SRA has transitioned to a "Safety 2" culture. This shift in SRA's approach to safety harnesses the expertise of our people.

A Safety 2 culture focuses on being curious about the work we do, engaging with staff, and celebrating when things go well.

SRA is committed to understanding the challenges and opportunities its teams face to ensure that staff are fully engaged in safety. This initiative is being led internally by Leader for Health, Safety and Environment, **Ms Anne-Louise Slack.**

KEY PERFORMANCE INDICATORS		MILESTONES FOR 2019/20
KFA9/KPI1	SRA Investor performance Rating increase to 85% by 2022.	Improvement on previous year's result towards 85% target.
KFA9/KPI2	Aggregated research investment benefit-cost ratio of 4:1 or above by 2022.	Aggregate impact assessment result of 4:1 or higher.
KFA9/KPI3	Maintain 100% compliance with statutory and contractual requirements.	100% compliance.
FORECAST 2019/20 INVESTMENT BUDGET – $8.8M		

PRIORTIES FOR 2019/20
Maintain excellent investor relations with effective consultation and engagement processes.
Enhance RD&A investment strategies and processes, targeting an increase in transformational research and solutions for prioritised problems.
Monitor and report on RD&A performance and the extent to which investor priorities are addressed and impact is delivered.
Facilitate access for our researchers to world-class technologies, capabilities and services that will drive innovation and transformational change.
Provide a safe working environment and transition to a Safety 2 culture focused on harnessing staff engagement to drive safety.
Develop and maintain an adaptable, skilled and satisfied workforce with a constructive organisational culture.
Achieve a sustainable financial position with strong financial oversight and stewardship.
Ensure effective governance and compliance with legislative and statutory funding requirements.
Apply appropriate technology and information systems that enhance service delivery.

PRIORTIES FOR 2019/20		TIMEFRAME
Strategic direction: deliver impact-driven strategic agenda and disruptive innovation.		
KFA9/DEL1	Enhanced Stakeholder Engagement Framework and ongoing investor consultation, including regular scheduled consultation between industry representative bodies and government investor representatives.	Ongoing
KFA9/DEL2	Annual review and amendment, where appropriate, of SRA's Strategic Plan.	Aug-19
KFA9/DEL3	Targeted RD&A investment strategies and program logic framework developed, monitored and reviewed.	Jun-20
KFA9/DEL4	Transformational RD&A in both SRA core and contestable research.	Jun-20
KFA9/DEL5	New and emerging technologies or methods to transform the way we conduct our science and support functions.	Jun-20
KFA9/DEL6	Innovation Catalyst initiative for employees to engage in team-based exploratory innovation and problem-solving activities, distinct and separate from core and contestable project activity.	Interim milestone report Aug-19 Final Reports by Jun-20
KFA9/DEL7	Monitoring and evaluation system enhanced to support Board and investor reporting on RD&A outputs, outcomes and impacts, including publication of Annual Performance Report.	Performance Report Oct-19 Impact Report Dec-19 and Jun-20
KFA9/DEL8	Independent Performance Review process commenced.	Apr-20
KFA9/DEL9	Long-term industry vision and strategy developed in collaboration with industry representatives.	Jun-20
Culture: embed investor-centric and performance-driven values and culture across SRA.		
KFA9/DEL10	Continued transition to a Safety 2 culture with enhanced worker safety, wellbeing, physical security and worker engagement and participation, and aligned to SRA's cultural transformation program.	Ongoing
KFA9/DEL11	Continued implementation of SRA's values-based cultural transformation program, including: annual workshops; bi-annual culture and values assessment; and ongoing leadership development.	Ongoing
KFA9/DEL12	Continued support provided to employees in implementing company values to reflect internal culture and working environment and stakeholder engagement.	Ongoing
KFA9/DEL13	Improved communication mechanisms to enable vertical and horizontal communication within the organi-sation, including: improved staff intranet; regular staff updates following Board meetings; rotating Executive and staff at various team meetings; inter-team meetings; SRA-wide video and teleconferencing; and CEO/staff engagement.	Ongoing
KFA9/DEL14	Revised administrative systems to remove unnecessary duplication and streamline processes.	Ongoing

People: attract, retain and develop a first-class workforce.		
KFA9/DEL15	Workplace health, safety and environmental management, framework and system improvements, reporting and support services.	Ongoing
KFA9/DEL16	People management planning and appraisal, including: leadership development and succession plans; employee performance plans and Executive mid-year performance appraisals; and benchmarking of employee remuneration and entitlements.	Employee performance plans Jul-19 Mid-year Executive performance appraisals Dec-19
KFA9/DEL17	Human Resources (HR) Strategy that will drive a people, leadership and performance focused culture.	Dec-19
KFA9/DEL18	Review and enhancement of recruitment and HR policies, systems and processes and contemporary best practice performance management and remuneration and reward processes, to support our people and position SRA as an employer of choice.	Dec-19
KFA9/DEL19	Continued implementation of professional development program.	Jun-19
Financial stewardship: maintain a sustainable financial position and improve treasury and budgetary management and oversight.		
KFA9/DEL20	New or enhanced business opportunities, partnerships, commercial arrangements and/or alternative funding sources.	Ongoing
KFA9/DEL21	Leveraged alternative funding sources and opportunities.	Ongoing
KFA9/DEL22	Continued deployment of contemporary and compliant finance, treasury management, payroll, governance and operational strategies, management plans, processes, performance, control and reporting systems.	Ongoing
KFA9/DEL23	Fit-for-purpose budgeting, forecasting and reporting solution.	Jun-19
KFA9/DEL24	Review of fixed assets and cost optimisation opportunities.	Jun-19
Resources: optimise resources, systems and processes to support leading-edge RD&A that meets the needs of our investors.		
KFA9/DEL25	RD&A investment framework, including: project calls and assessment; direct commissioning of projects; portfolio management; systematic portfolio analysis; project and program evaluations and cost-benefit analyses; and portfolio reporting.	Ongoing
KFA9/DEL26	Best practice governance processes and reporting.	Ongoing
KFA9/DEL27	Review and enhancement of SRA's Compliance Framework, including Compliance Register and Compliance Calendar, linked to SRA's Risk Management Framework, and allocation of roles and responsibilities to key personnel in specific business areas to be charged with responsibility for compliance.	Sep-19
KFA9/DEL28	Board and Executive oversight, review and approval of policies consistent with the company's Strategic Plan and governance arrangements.	Ongoing
KFA9/DEL29	Review and enhancement of SRA's Risk Management Framework, including strategic and operational risk registers.	Dec-19
KFA9/DEL30	Delivery of assurance and risk mitigation through execution of independently scrutinised, internal audit reviews. Two to four internal audit reviews performed annually, as prioritised based on ongoing assessment of key strategic risks.	Research Funding Acquittals Internal Audit Final Report Aug-19 2019/20 Internal Audit Program set Sep-19
KFA9/DEL31	Levy Payer Register established in collaboration with the Commonwealth Department of Agriculture.	Levy payer register established Jul-19
KFA9/DEL32	IP management system for identification and ongoing management of current and future IP generated through SRA's R&D portfolio.	Ongoing
KFA9/DEL33	Asset management planning and systems, including: review of fixed assets and cost options; maintenance, refurbishment or redevelopment of facilities; best-practice certification for research station and farm management.	Ongoing
KFA1/ DEL34	Redevelopment, launch and maintenance of breeding program database SPIDNET.	Launched Nov-19
KFA9/DEL35	Information technology (IT) Strategy is finalised and a staged implementation plan developed for priority areas for system enhancement, capital investment and continual system improvement, including platforms that support SRA activities through enhanced integrated software and hardware; faster network; migration to cloud technology; enhanced data management; sharing, storage and security, and enhanced IT service delivery.	Cloud based data hosting and storage solution Dec-19 Investigate and implement potential SRA network improvements Mar-20

5. INCOME AND EXPENDITURE FORECAST

FORECAST FINANCIAL POSITION

SRA's current RD&A investment portfolio is structured to meet our investor priorities and expectations with respect to delivering valued benefits and maximised return on investment. To deliver on this portfolio and achieve the planned outcomes, SRA's operating expenditure is expected to be greater than our operating income, with a forecast deficit in 2019/20 of $3.1m. The downturn in operating income is due to a range of factors, including forecast reduction in Australian sugarcane production and a sustained negative outlook for world sugar prices. SRA will utilise accumulated financial reserves to fund our RD&A investment and activities for 2019/20, whilst SRA's Board and Management will continue to implement strategies to work towards a balanced budget and ensure ongoing financial sustainability. A summary of SRA's Board-approved forecast income and expenditure for 2019/20 is provided in Table 1.

TABLE 1: FORECAST INCOME AND EXPENDITURE 2019/20

OPERATING INCOME	2019/19 ($K)
Industry investment [6]	22,120
Commonwealth co-investment [7]	6,291
Queensland Government co-investment [8]	3,109
Collaboration/Service Fee income [9]	7,253
Interest	850
Other	840
Operating income total	**40,463**
R&D	
R&D contestable - externally won [10]	8,341
R&D contestable - internally won	5,790
R&D internal core [11]	11,974
Industrial contract research	2,858
Research Adoption [12]	5,765
R&D operational support [13]	4,790
Operating income total	**39,518**
Corporate	
Board and investor relations	1,100
Corporate support [14]	2,908
Corporate total	4,008
Operating expenditure total	43,527
SRA operating result for the year	**(3,063)**

[6] *Assumes crop production of 31.6 million tonnes for 2019 season.*
[7] *Commonwealth co-investment made under the 2017-2022 Statutory Funding Contract between SRA and the Commonwealth Government, administered by the Department of Agriculture.*
[8] *Includes $2.85m Department of Agriculture and Fisheries contribution and $259k Department of Environment and Science Nitrogen collaborative project income.*
[9] *Includes $1.36m from Rural R&D for Profit Programme.*
[10] *Includes ($129k) milestones in current year that complete in following year.*
[11] *Internal core includes plant breeding, biosecurity and plant health.*
[12] *Research adoption includes adoption and communications.*
[13] *Includes research funding management, research stations and resources, and research KFA management.*
[14] *Includes Finance, IT, HR, Library and IP.*

SRA reviews income and expenditure on a monthly basis and undertakes a re-forecasting exercise every quarter of the year to account for changes in SRA's operating environment and to enable flexibility to respond to immediate and/or emerging challenges and opportunities.

INVESTMENT ACROSS KFAS

Figure 4 details the expenditure allocation across the KFAs. Reflective of investor expectations with respect to SRA's RD&A investment, and in line with SRA's Strategic Plan, the majority of investment lies within our plant breeding program under KFA1.

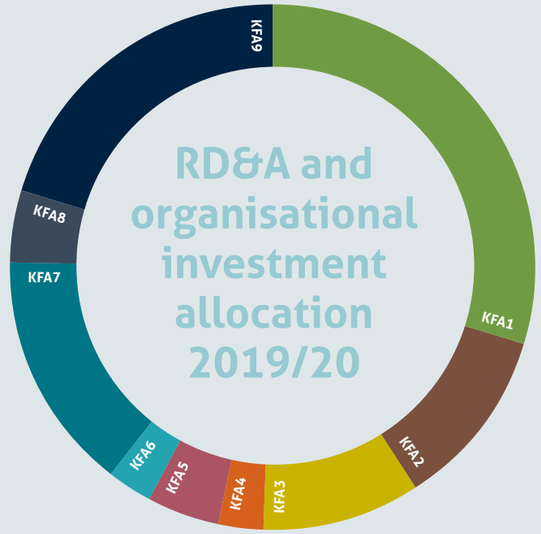
Attachment 2 provides a breakdown of KFA expenditure by projects.

SRA RD&A Investment and organisational expenditure

KFA	MILLION*
KFA1 / OPTIMALLY-ADAPTED VARIETIES, PLANT BREEDING AND RELEASE	$13.0M
KFA2 / SOIL HEALTH, NUTRIENT MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY	$4.9M
KFA3 / PEST, DISEASE AND WEED MANAGEMENT	$4.2M
KFA4 / FARMING SYSTEMS AND HARVESTING	$1.3M
KFA5 / MILLING EFFICIENCY AND TECHNOLOGY	$1.9M
KFA6 / PRODUCT DIVERSIFICATION AND VALUE ADDITION	$1.2M
KFA7 / KNOWLEDGE AND TECHNOLOGY TRANSFER AND ADOPTION	$6.3M
KFA8 / COLLABORATION AND CAPABILITY DEVELOPMENT	$1.9M
RD&A expenditure	**$34.7M**
KFA9 / ORGANISATIONAL EFFECTIVENESS	**$8.8M**
Total expenditure	**$43.5M**

**Numbers are rounded.*

FIGURE 4: EXPENDITURE ACROSS KFAs



6. BALANCED PORTFOLIO

SRA is committed to ensuring it invests, manages and participates in a balanced portfolio of RD&A activities that is appropriate to meeting investor needs and providing an attractive return on investment.

To achieve an optimally-balanced investment portfolio, SRA will undertake to:

- Align RD&A investment with industry and government investor priorities at both regional and industry levels;
- Invest in short, medium and long- term projects across the research pipeline;
- Address current gaps in the existing portfolio in terms of delivering on the objectives of SRA's Strategic Plan;
- Appropriately manage RD&A risk-profile, with a combination of low-risk projects targeting incremental improvements and higher-risk transformational projects;
- Leverage investment through partnerships and collaborations; and
- Maximise return for our investors through increased adoption and practice change.

SRA's RD&A portfolio comprises both core and contestable RD&A projects. The core projects are undertaken internally by SRA and include plant breeding, biosecurity and adoption activities. The contestable projects are undertaken by both SRA and external providers and cover the gamut of SRA's KFAs.

SRA's independent skills-based Research Funding Panel (RFP) and Research Funding Unit (RFU) manage the contestable research investment process and associated review and evaluation of investment projects. The primary objective of the RFP is to ensure transparent, independent and robust review of all RD&A project investment from SRA's contestable pool of industry and government investment funds.

Research projects are ranked by the RFP using an Attractiveness/Feasibility process which has been designed to assess the magnitude of potential benefits, taking into account the likely adoption of the project outcomes or innovations (Attractiveness) and the prospects of the project delivering them (Feasibility). Attractiveness is assessed using an input-output-outcome-impact analysis of the project proposals, whilst Feasibility is assessed by considering research risk and quality, using peer assessment and RFP expertise. In 2019/20, the RFP will be implementing an improved investment framework that will incorporate econometric modelling to inform investment decision-making.

The RFP and RFU also undertake a portfolio gap analysis annually to assess progress of the RD&A portfolio against SRA's Strategic Plan objectives and key outcomes and identify research and strategy gaps to be addressed through targeted investment calls and/or commissioned research.

SRA also has an established Risk Management Framework, including a Risk Management Policy and Risk Appetite Statement approved by the Board and reviewed annually. The Risk Appetite Statement outlines the type of risk and associated risk tolerance that SRA is willing to take in order to meet its strategic objectives. SRA's current Risk Appetite Statement states that "SRA seeks to balance the risk position between: investing in transformational and step change activities that may provide high impact benefits to the Australian sugarcane industry; and the need to remain a viable organisation with the capacity to continue to work for our members long into the future".

To ensure SRA continues to provide a balanced portfolio that meets investor needs and expectations, SRA engages and consults on a regular basis with industry and government investors, industry representative bodies and regionally-based advisory groups and committees to identify RD&A priorities – at both a regional and whole-of-industry level – and report on the performance of SRA's RD&A investment portfolio in terms of outputs, outcomes and return on investment being delivered.

ATTACHMENT 1

ALIGNMENT OF SRA'S KFAS TO INDUSTRY AND GOVERNMENT PRIORITIES

STAKEHOLDER PRIORITIES	1. OPTIMALLY-ADAPTED VARIETIES, PLANT BREEDING AND RELEASE	2. SOIL HEALTH, NUTRIENT MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY	3. PEST, DISEASE AND WEED MANAGEMENT	4. FARMING SYSTEMS AND HARVESTING	5. MILLING EFFICIENCY AND TECHNOLOGY	6. PRODUCT DIVERSIFICATION AND VALUE ADDITION	7. KNOWLEDGE AND TECHNOLOGY TRANSFER AND ADOPTION	8. COLLABORATION AND CAPABILITY DEVELOPMENT	9. ORGANISATIONAL EFFECTIVENESS
National Sugarcane Industry RD&E Strategy – Themes [15]									
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 [16]									
1. Food	■		■	■	■	■	■	■	■
2. Soil and water	■	■	■	■	■		■	■	■
3. Transport									
4. Cybersecurity									
5. Energy							■	■	
6. Resources									
7. Advanced manufacturing	■		■	■	■	■	■	■	■
8. Environmental change	■	■	■	■	■		■	■	■
9. Health									
Rural RD&E Priorities [17]									
1. Advanced technology	■		■	■	■	■	■	■	■
2. Biosecurity	■		■				■	■	■
3. Soil, water and managing natural resources	■	■	■	■	■		■	■	■
4. Adoption of R&D	■	■	■	■	■		■	■	■
Queensland Department of Agriculture and Fisheries – Theme Areas for Sugarcane Research Investment [18]									
1. Sugarcane improvement – to improve productivity, quality and production efficiency	■								■
2. Sugarcane plant protection	■	■	■	■					■
3. Farming Systems broad acre dry land and irrigated, and mixed crop farming systems in Queensland		■		■			■		■
4. Soil health		■		■					■
5. New market opportunities and processes						■			
6. Agri-intelligent systems				■	■				
7. Breaking barriers to adoption							■		

15 *National Sugarcane Industry RD&E Strategy, 2017.*
16 *National Science and Research Priorities,* Australian Government, 2015.
17 *Rural RD&E Priorities,* Agricultural Competitiveness White Paper, Australian Government, 2015.
18 *Department Strategic Objectives for funding projects for SUGARCANE,* Queensland Department of Agriculture and Fisheries, 2018.

ATTACHMENT 2

PROJECT PORTFOLIO AND INVESTMENT BY KFA

The following project type classifications are used within SRA's investment portfolio:

- C SRA – R&D contestable - internally won;
- C Ext – R&D contestable - externally won;
- CRP – collaborative research project; and
- SRA – R&D internal core and corporate support projects.

KFA1: OPTIMALLY-ADAPTED VARIETIES, PLANT BREEDING AND RELEASE

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2010002	Australian support of the International Consortium for Sugarcane.	C Ext	25
2013022	Exploiting introgression for the development of productive and regionally adapted varieties for New South Wales.	CRP	48
2015016	Leaf sucrose: the link to diseases such as YCS and enhancement of sugarcane productivity.	C SRA	320
2016028	Improving early stage selection of SRA breeding program by indirect selection of plant vigour.	C SRA	45
2016032	Optimising productivity, variety recommendations and mill operations through analysis of mill data.	C SRA	301
2016044	Licence to farm: nitrogen use efficient varieties to meet the future environmental targets.	C SRA	15
2017002 / 2017806	Implementing and validating genomic selection in SRA breeding programs to accelerate improvements in yield, commercial cane sugar, and other key traits.	CRP	358
2018001	Compendium of sugarcane traits and their associated genes.	C Ext	10
2018002	Validating root system traits for enhanced nutrient capture in challenging environments.	C Ext	248
2018004	Impact of stool architecture on ratooning: extending current trial to four ratoons to strengthen correlations.	C Ext	127
2018005	Genetic analysis and marker delivery for sugarcane breeding.	C Ext	377
2018006	Selecting high value chromosomes from Saccharum species - extension to 2015026.	C Ext	235
2018801	Genetic analysis and marker delivery	CRP	86
2019001	NIR calibrations for fibre quality.	C SRA	222
2019002	Validating high throughput phenomics technologies for sugarcane clonal selection.	C SRA	270
ANADATA	Statistical analysis of data.	SRA	327
BIODTLY / BIODWFD	Development of resistant varieties.	SRA	657
INNOV7	Seed-based in vitro propagation of crossing progenies for rapid evaluation.	SRA	18
PLANBKN / PLANCEN / PLANHBT / PLANNSW / PLANNTH / PLANSTH	Plant breeding – core selection.	SRA	6,249

KFA1: OPTIMALLY-ADAPTED VARIETIES, PLANT BREEDING AND RELEASE (CONTINUED)

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
PLANCRO	Plant breeding – crossing.	SRA	640
PLANDNA	Molecular Selection.	SRA	331
PLANGEN	Plant breeding – introgression.	SRA	351
PLANINT	Plant breeding – integrated database and crossing systems.	SRA	135
PLANLAB	Laboratory.	SRA	49
PLANMGT	Breeding management.	SRA	530
PLANPBR	Plant Breeder's Rights.	SRA	53
PLANQCS	QCANESelect® Support.	SRA	29
PLANSPE	Spectracane Support.	SRA	214
PLANVPD	Variety Propagation and Distribution.	SRA	697
		Total Investment KFA1	**12,966**

KFA2: SOIL HEALTH, NUTRIENT MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2015065	Improving nitrogen-use efficiency for sugarcane crops with constrained yield potential.	C SRA	63
2015907	More profit from nitrogen: enhancing the nutrient use efficiency on intensive cropping and pasture systems.	C Ext	47
2016804	Complete nutrient management planning for cane farming.	CRP	9
2016805	Improved water quality outcomes from on-farm nitrogen management.	CRP	31
2016807	Reef Trust 4 – cane farmer trials of enhanced efficiency fertiliser in the catchments of the Great Barrier Reef.	CRP	1,593
2017004 / 2017805	SIX EASY STEPS – continuing perspectives in time and space.	CRP	1,087
2017005	Measuring soil health, setting benchmarks and driving practice change in the sugar industry.	C SRA	679
2017009	Unravelling the impact of climate and harvest time on nitrogen fertiliser requirements.	C SRA	384
2018003	Implementation of root system diagnostics to deliver a field-based measure for root health.	C Ext	247
2018007	Greenhouse gas emissions from sugarcane soils: strategies for increasing nitrogen use efficiency and reducing environmental pollution.	C Ext	282
2018008	Establishing sugarcane farming systems to improve soil health.	C SRA	288
2018013	SIX EASY STEPS Tool Box.	C SRA	146
		Total Investment KFA2	**4,856**

KFA3: PEST, DISEASE AND WEED MANAGEMENT

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2014049	Solving YCS.	C SRA	622
2015804	Soldier fly management.	CRP	105
2015812	YCS screening .	CRP	7
2016003	Identifying new-generation insecticides for canegrub control as contingency for loss of amenity with the existing product.	C SRA	377
2016064 / 2016806	Investigation of biotic causes of YCS.	CRP	310
2017008	Keeping chemicals in their place – in the field.	C SRA	359
2017010	Delivering solutions for chlorotic streak disease.	C SRA	78
2017808	Feeding behaviour of Soldier fly.	CRP	92
2017809	Modern diagnostics for a safer Australian sugar industry.	CRP	310
2017902	Improving plant pest management through cross-industry deployment of smart sensors, diagnostics and forecasting.	C Ext	205
2018009	Development of commercial molecular biological assays for improved sugarcane soil health and productivity.	C SRA	186
2018010	Moth Borers – how are we going to manage them when they arrive?	C SRA	140
2019003	Ratoon stunting disease (RSD) detection at the factory – disease detection blueprint.	C SRA	178
BIOBRSD	Development for an improved commercial assay for ratoon stunting disease (RSD).	SRA	8
BIOEBBG / BIOEMER / BIOEMKY	Biosecurity entomology.	SRA	22
BIOPIND / BIOPTLY / BIOPWFD	Biosecurity pathology.	SRA	347
BIOQUAR	Quarantine pathology.	SRA	250
BIORSDL	RSD laboratory.	SRA	219
BIOSPLY	Soil pathogen laboratory.	SRA	103
INNOVA5	Develop a methodology to screen cane varieties for their tolerance to pre-emergence herbicides.	SRA	16
INNOVA6	Integrated solution for 'on farm' pathogen detection for sugarcane diseases.	SRA	14
PHEAMGT	Plant health management.	SRA	253
		Total Investment KFA3	**4,200**

KFA4: FARMING SYSTEMS AND HARVESTING

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2014048	Increased harvest recovery: reducing sugar loss and stool damage.	C SRA	240
2015007	Assessment of new management strategies and varieties for marginal soils.	C SRA	252
2016062	Remote sensing platform for precision agriculture.	C Ext	130
2016952	Understanding interactions between basecutters and other forward-feed components with the cane stalk, and determining practical strategies to minimise damage as harvester speed increases.	C Ext	295
2017012	Southern sugar solutions.	C Ext	162
2017014	Seeing is believing: managing soil variability, improving crop yield and minimising off-site impacts in sugarcane using digital soil mapping.	C Ext	104
2019004	Harvest losses assessment by real-time Machine Vision Systems.	C Ext	61
AGROMGT	Agronomy Management.	SRA	28
INNOVA8	Leveling paddocks while maintaining permanent beds.	SRA	22
		Total Investment KFA4	**1,296**

KFA5: MILLING EFFICIENCY AND TECHNOLOGY

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2015013	Investigation into modifying pan boiling techniques to improve sugar quality.	C Ext	192
2016019	Developing online analysis systems to measure the available nutrients in mill mud.	C SRA	298
2016020	Reducing boiler maintenance costs and deferring capital expenditure through improved technology.	C Ext	19
2017006	Managing aspects of raw sugar quality in the Australian sugar industry – Part II.	C Ext	249
2017007	Investigations to mitigate the effects of sucrose degradation and acid formation in factory evaporators on sugar recovery and quality, corrosion and effluent loadings.	C Ext	131
2018012	Pan design and operational changes to suit Australian pan stages operating on low pressure vapour.	C Ext	189
2019005	Improved strategies to process soft canes.	C Ext	139
2019006	Australian Sugar Industry Training – Development of factory training modules – Phase 2.	C Ext	154
2019201	Falling film evaporators.	C Ext	50
2019202	Fixed element crystalliser.	C Ext	50
2019203	Cleated belts.	C Ext	29
2019204	Surging in shredders.	C Ext	19
NIRDMER	NIR at Meringa.	SRA	109
PLANCAS	CAS Service and Support.	SRA	304
		Total Investment KFA5	**1,932**

KFA6: PRODUCT DIVERSIFICATION AND VALUE ADDITION

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2016801	Australian Research Council (ARC) linkage project: manipulation of carbon partitioning to enhance the value of sugarcane.	CRP	9
2019902	Biorefineries for Profit – Phase 2.	C Ext	1,200
		Total Investment KFA6	**1,209**

KFA7: KNOWLEDGE AND TECHNOLOGY TRANSFER AND ADOPTION

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2016002	Protecting our chemicals for the future through accelerated adoption of best management practice.	C SRA	289
2017011	Productivity improvements through energy innovation in the Australian sugar industry.	C Ext	180
2017810	Pathways to water quality improvements in the Myrtle Creek sub catchment.	CRP	104
2018803	Cane to Creek 2.0.	CRP	660
2018804	Pilot Agricultural Extension Work Placement Program.	CRP	22
COMMMGR	SRA communications, marketing and graphic design.	SRA	643
EXECPEC	Executive management – research adoption.	SRA	426
PECCOMM	Research adoption – non-project related.	SRA	4,014
		Total Investment KFA7	**6,338**

KFA8: COLLABORATION AND CAPABILITY DEVELOPMENT

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2007003	Collaboration, cross-sectoral and industry good investment.	C Ext	436
2013900	Contribution to Council of Rural Research and Development Corporations (CRRDC).	C Ext	30
2014200	Research workshops.	C SRA	435
2014201	Board approved uncontracted 2019/20 capability investment.	C Ext / SRA	234
2016101	PhD Scholarship: Combining controlled release and nitrification inhibitor properties to deliver improved fertiliser nitrogen use efficiency in high-risk environments.	C Ext	20
2016102	PhD Scholarship: Development and modelling of novel controlled release fertilisers for improved nutrient delivery.	C Ext	30
2017013	Integrated standardised competency based training for sugar milling operations.	C Ext	47
2017101	PhD Scholarship: Re-evaluating the biology of the sugarcane root system: new knowledge allows for assessment of production impacts and implications for yield decline.	C Ext	42
2017102	PhD Scholarship: Microwave sensors for sugarcane sugar analysis.	C Ext	30
2017402	Early Career/Mid-Career Research Award.	C SRA	3

KFA8: COLLABORATION AND CAPABILITY DEVELOPMENT (CONTINUED)

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
2018015	Sugar Milling R&D Capability Building Program.	C Ext	133
2018101	Scholarship: New approaches to quantifying nitrogen fluxes in enhanced efficiency fertilisers in Australian sugarcane soils.	C Ext	31
2018102	Scholarship: Characterising nitrogen use efficiency in sugarcane.	C Ext	31
2018306	Sugar Travel and Learning Awards.	C Ext	3
2018401	Research Award: Reducing basecutter cane loss and extending the wear life of basecutter blades through innovative hardfacing techniques.	C Ext	5
2018402	Research Award: Developing a marker system to measure dosage of alleles for use as a selection tool in the sugarcane breeding program.	C Ext	4
2018500	NextCrop industry leadership development program.	CExt	225
2018501	Building a sugar industry economic model to quantify and prioritise global trade policy and market access initiatives for the Australian sugar industry.	C Ext	193
		Total Investment KFA8	**1,931**

KFA9: ORGANISATIONAL EFFECTIVENESS

PROJECTS

PROJECT NO.	DESCRIPTION	PROJECT TYPE	2019/20 $K
Various	Research funding management, research stations and resources.	SRA	4,790
Various	Board and investor relations.	SRA	1,100
Various	Corporate Support.	SRA	2,908
		Total Investment KFA9	**8,798**

ATTACHMENT 3

ABBREVIATIONS AND ACRONYMS

AOP	Annual Operational Plan
ARC	Australian Research Council
BAS	Bagasse NIR systems
BoM	Bureau of Meteorology
C Ext	R&D contestable - externally won
C SRA	R&D contestable - internally won
CAS	Cane NIR Systems
CCS	Commercial cane sugar
CEO	Chief Executive Officer
CRC	Cooperative Research Centre
CRP	Collaborative research project
CRRDC	Council of Rural Research and Development Corporations
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cth	Commonwealth
DNA	Deoxyribonucleic acid
EEF	Enhanced efficiency fertiliser
FAT	Final assessment trial
GHG	Greenhouse gases
HBP	Harvesting Best Practice
HR	Human resources
IP	Intellectual property
IT	Information technology
K	Thousand
KFAs	Key focus areas
KPIs	Key performance indicators
LSB	Leaf sheath biopsy
M	Million
MoU	Memorandum of Understanding
NIR	Near infra-red
NRM	Natural resource management
NSW	New South Wales
PNG	Papua New Guinea
PBR	Plant Breeder's Rights
PhD	Doctor of Philosophy
PCR	Polymerase chain reaction
qPCR	Quantitative polymerase chain reaction
QLD	Queensland
QUT	Queensland University of Technology
R&D	Research and development
RDCs	Research and development corporations
RD&A	Research, development and adoption
RD&E	Research, development and extension
RFP	Research Funding Panel
RFU	Research Funding Unit
RSD	Ratoon stunting disease
SCHLOT	Sugarcane Harvesting Logistics Optimisation Tool
SMRP	Small Milling Research Program
SNP	Single nucleotide polymorphism
SRA	Sugar Research Australia Limited
STLA	Sugar Industry Travel and Learning Award
SAS	Sugar NIR Systems
SSMV	Sugarcane Streak Mosaic Virus
UAV	Unmanned aerial vehicle
YCS	Yellow canopy syndrome

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