



# Annual Operational Plan 2017-18



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### Acknowledgements

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



**Australian Government**  
**Department of Agriculture  
and Water Resources**



**Queensland  
Government**



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## 1. MESSAGE FROM THE CHIEF EXECUTIVE OFFICER

I am pleased to present Sugar Research Australia Limited's (SRA's) Annual Operating Plan (AOP) for 2017/18. This AOP informs our investors, employees, research partners and other interested stakeholders about the research, development and adoption (RD&A) activities and investment program SRA will be undertaking during 2017/18, and how we will measure and report on SRA's performance.

The AOP represents the first year of activity under SRA's new 2017/18 – 2021/22 Strategic Plan. The focus of SRA's Strategic Plan, and this AOP, is on RD&A investment that is directed towards addressing the challenges and opportunities facing the Australian sugarcane industry, with an appropriate degree of focus on research where we can have the most impact.

More specifically, SRA's strategic intent is to:

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 culture.

SRA recognises however that we cannot deliver on these goals on our own. SRA is at the heart of a complex and dynamic network of individuals and organisations consisting of those who invest in SRA, those who partner with SRA, those who conduct the research, those who translate knowledge and research, and those who will adopt the knowledge and research. To succeed, we must enhance our relationships and the way we interact with all of these players in the industry value chain and establish strong collaborations through which we can leverage investment, capability, knowledge transfer, practice change and adoption of new technology.

SRA investors demand that we continue to innovate within our core capabilities, in particular our plant breeding program, and how we manage our RD&A investment portfolio so that we maximise returns for our industry and government investors.

In addition, we need to maintain an enabling environment in which our culture, people and physical resources are appropriately allocated and deployed to support research and value-delivery for our investors.

This AOP outlines how we intend to do all of this – from the key RD&A priorities to be addressed, to the projects to be undertaken, to the planned outputs to be delivered, to the measures by which we will track our progress and, most importantly, to the impacts we are seeking to deliver for our industry and government investors and the broader community.



**Neil Fisher**  
Chief Executive Officer

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## 2. INTRODUCTION

SRA was established in 2013 as 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 core responsibilities 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 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.

We have a strong presence across the main sugarcane growing regions of New South Wales and Queensland, with approximately 170 employees based at nine research farms, laboratories and offices.

Our activities are funded through statutory levy payments from sugarcane growers and millers (\$23.8 million in 2017/18), co-investment from both the Commonwealth (\$7.2 million in 2017/18) and Queensland Governments (\$2.85 million from the Department of Agriculture and Fisheries and \$0.46 million from the Department of Environment and Heritage Protection in 2017/18) and collaborative investment from other research providers and private sector partners, as well as through other commercial sources such as cane sales.

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.

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 2017/18, to deliver on SRA's 2017/18 – 2021/22 Strategic Plan. 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 research and development corporations (RDCs) to address cross-sectoral issues impacting agricultural industries, and identify and improve access to leading-edge innovation, best-practice and technological advancements.

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### 3. STRATEGIC AGENDA

#### 3.1. 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, 2017.*

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.

In responding to the industry and government 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.

Table 1 details SRA's estimated total investment for 2017/18 allocated against each of the National Science and Research Priorities and the Rural RD&E Priorities.

**Table 1: SRA's RD&A investment estimates 2017/18 across Commonwealth Government priorities**

Stakeholder Priorities	Total Investment 2017/18	
	(\$k)	%
<b><i>National Science and Research Priorities<sup>1</sup></i></b>		
1. Food	22,926	49%
2. Soil and water	5,354	11%
3. Transport	497	1%
4. Cybersecurity	-	-
5. Energy	471	1%
6. Resources	-	-
7. Advanced manufacturing	1,747	4%
8. Environmental change	2,522	5%
9. Health	-	-
<i>Other*</i>	13,386	29%
<b>Total</b>	<b>46,903</b>	<b>100%</b>
<b><i>Rural RD&amp;E Priorities<sup>2</sup></i></b>		
1. Advanced technology	14,170	30%
2. Biosecurity	8,123	17%
3. Soil, water and managing natural resources	7,670	16%
4. Adoption of R&D	3,553	8%
<i>Other*</i>	13,386	29%
<b>Total</b>	<b>46,903</b>	<b>100%</b>

To ensure SRA continues to meet investor priorities and expectations, SRA consults regularly with industry representative bodies and government representatives. These consultations include scheduled formal 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 2017/18 Annual Report.

### 3.2. SRA's strategic framework

SRA's strategic framework 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, as set down in SRA's Strategic Plan, is shown in Figure 1.

<sup>1</sup> *National Science and Research Priorities*, Australian Government, 2015.

<sup>2</sup> *Rural RD&E Priorities*, Agricultural Competitiveness White Paper, Australian Government, 2015.

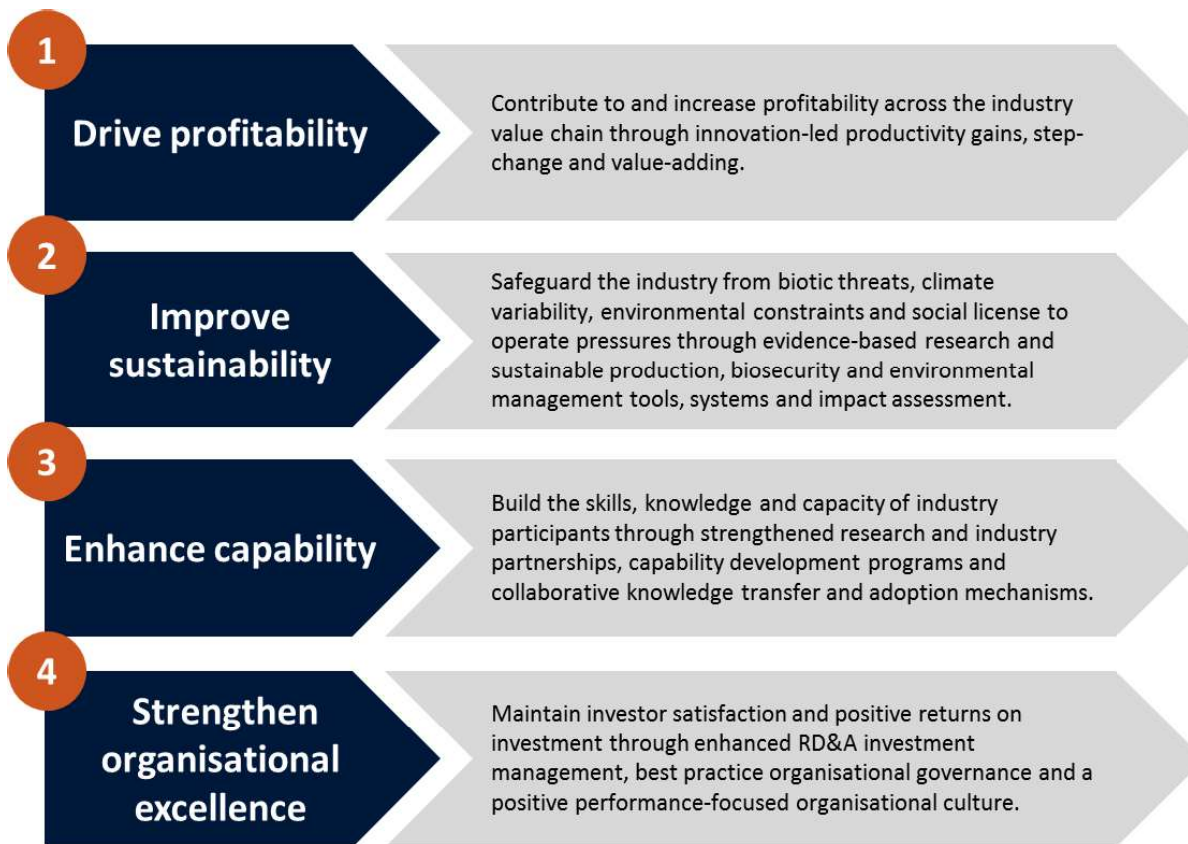
\* Other includes unallocated research, R&D management and corporate support.

Figure 1: SRA’s strategic framework for delivering valued sugarcane RD&A





SRA has introduced four overarching goals and refined our KFAs with RD&A programs to provide further clarity in purpose and alignment with investor priorities. The goals reflect SRA's strong contribution to outcomes sought by industry.



### 3.3. Critical research investment priorities

In developing SRA's 2017/18 – 2021/22 Strategic Plan, SRA investors identified a number of current industry challenges and opportunities that require immediate attention and/or increased investment. These critical research areas and examples of key deliverables for 2017/18 are as follows:

#### 3.3.1. Modernising plant breeding and broadening genetic base

Improved sugarcane varieties are key to ongoing productivity, sustainability and competitiveness of the Australian industry. Given existing constraints to conventional variety development, such as long development lead times, SRA is exploring step-changes in plant breeding through cutting-edge technologies like molecular breeding and phenomics. As a critical area of research focus, SRA is investing in discovery and mapping of molecular markers, identification and validation of marker-trait associations and exploration and implementation of genomic and high-throughput phenotyping selection to improve early-stage selection and to maximise clonal performance. In 2017/18, this will include genotyping of 900 clones for exceptional tonnes of cane per hectare (TCH) and commercial cane sugar (CCS) phenotypes, and establishment of an optimal selection index for crop vigour based on canopy temperature. Combined with augmentation of SRA's introgression breeding pipeline, these investments will produce a more efficient and highly streamlined breeding program that will deliver commercially desirable and high-performing varieties.

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### **3.3.2. Enhancing soil health and nutrient management**

Improving soil health and biology through improved soil management practices has been recognised as a vital component of alleviating productivity constraints. In addition, increasing public awareness and concern for the health of the Great Barrier Reef and the impact of land management practices on water quality run-off has led to the need for more efficient soil, nutrient and water management on farm. As such, SRA has elevated soil health, nutrient management and managing climate variability as a critical research investment priority. In 2017/18, this investment includes development of improved decision support tools for efficient nutrient management that accounts for climate variability, updating of SIX EASY STEPS nutrient management guidelines, recommendations for controlled-released fertilisers and research trials for greater understanding of enhanced efficiency fertiliser effects on productivity. SRA's ongoing investment and prioritisation in this area will equip the industry with practical, cost-effective and efficient farm management solutions while simultaneously improving off-farm water quality impacts.

### **3.3.3. Implementing new strategy to improve knowledge transfer and adoption**

Widespread adoption of research outcomes is fundamental to obtaining the full value of SRA's R&D investment. Currently, adoption of new technologies, research innovations and improved practices across the Australian sugarcane industry is sub-optimal and extension advisory services are fragmented. A number of factors contribute to this including variable resourcing and co-ordination of adoption activities across industry and government extension services, varying capacity and interest in adoption of new technologies and disconnect between SRA and potential adopters. In 2017/18 SRA will tackle adoption and communication problems head-on, by working in unison with our growers, millers and the advisory sector to implement a new strategy to galvanise the promotion of research knowledge and actively encourage adoption of new technology and practices that make a real difference.

### **3.3.4. Driving adoption of harvesting systems and cane cleaning best practices**

Sugarcane production and profitability is affected by harvesting practices and in-field conditions that affect raw sugar quantity and quality. Substantial research has demonstrated that sub-optimal mechanical harvesting (inefficient fan speeds, pour rates etc.) result in in-field losses of varying but often substantial magnitudes. This includes extractor losses of 5-10 per cent, pick-up losses of 1-10 per cent and chopper losses of 2-8 per cent. Field conditions, such as crop presentation (row profile/width), can also contribute to stool damage, pick-up losses and extraneous matter (EM). SRA investment is focused on quantifying and demonstrating the positive impacts of Harvesting Best Practices on productivity and profitability as widely as possible. SRA will continue in 2017/18 to engage in a number of collaborative projects with industry partners, including the expansion of SRA harvesting demonstration trials to reach more of the industry, building and testing of a large cane cleaner test rig and ongoing calibration and demonstration to industry of a real-time harvest decision-making tool (Sugarcane Harvesting Logistics Optimisation Tool – SCHLOT).

### **3.3.5. Understanding and managing yellow canopy syndrome (YCS)**

YCS is a condition of unknown cause currently affecting sugarcane crops in Queensland. Since initial discovery in early 2012 near Cairns, it has now been found in all sugarcane growing regions from Maryborough to Far North Queensland. Research to date has revealed several important results including: starch accumulates in YCS affected leaves rather than being transported into the cane; field trials have excluded water stress by itself as a cause; severity appears related to age of the plant and its growth rate at first appearance of YCS; and not all plants suffer a yield penalty. YCS continues to be a critical research priority in 2017/18 with research activity focused on identifying any biotic causal factors, understanding why affected sugarcane cannot export sucrose from the leaves and where the physiological disorder starts, casual factors associated with compromised water transport, exploration of genetic variability for YCS tolerance and development of a diagnostic tool.

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### 3.4. Enabling strategies

During 2017/18, SRA will develop a suite of enabling strategies that will support delivery of our Strategic Plan and ensure we get the greatest impact from our RD&A investment. Consideration of the following critical success areas will be taken in to account when developing and implementing our enabling strategies:

- Mapping the future – working with industry representative bodies to convene a Futures Forum to undertake long-range scenario planning, vision setting and strategic targets;
- Sustaining financial viability – leveraging co-investment, commercialisation opportunities and accelerating returns from investment;
- Partnering for impact – collaborating with others to optimise RD&A outcomes;
- Innovating the way we conduct science – application of new ‘game-changing’ scientific tools and techniques;
- Getting the best return out of our RD&A investment – reviewing our risk profile to accommodate higher-risk activities, such as strategic basic research, and improving investment evaluation processes to characterise industry gains as a result; and
- Continuing our cultural transformation – fostering and promoting a productive organisational culture that is built around our shared values of Innovation, Investor Satisfaction, Accountability and Teamwork.

## 4. RD&A DELIVERABLES FOR 2017/18

### 4.1. RD&A deliverables by KFA

#### KFA1: Optimally-adapted varieties, plant breeding and release

DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)	
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.

KEY RD&A PRIORITIES	
KFA1/PRI1	Modernise the breeding program to increase the rate of genetic gain.
KFA1/PRI2	Broaden the genetic base.
KFA1/PRI3	Enhance communication of varietal information to growers.

**PROGRAM 1 – Plant genetics/selection:** improve breeding systems for genetic gain and delivery of new varieties through use of new molecular marker technology and introgression pipeline.

OUTPUTS for 2017/18	
KFA1/DEL1	Review and streamline breeding operations.
KFA1/DEL2	Development and streamlining of core introgression pipeline.
KFA1/DEL3	Creation of new <i>Erianthus</i> introgression populations to access new sources of <i>Pachymetra</i> resistance.
KFA1/DEL4	Ongoing crossing activities to develop new breeding populations.
KFA1/DEL5	Single nucleotide polymorphism (SNP) chip for introgression of resistance genes from wild germplasm into sugarcane, targeting Smut, <i>Pachymetra</i> and nematodes.
KFA1/DEL6	Disease screening of clones and parent materials for breeding program to inform selection.
KFA1/DEL7	Genotyping of approximately 900 clones with excellent TCH and CCS phenotypes.
KFA1/DEL8	Sugarcane Hub for sugarcane genome sequence and sugarcane genetic data.



OUTPUTS for 2017/18	
KFA1/DEL9	Development of methods for flow sorting sugarcane or <i>Erianthus</i> chromosomes and a protocol generation of metaphase chromosomes in sugarcane with a high mitotic index.
KFA1/DEL10	Field trials genotyped and screened for red rot resistance, cane and sugar yield and yield components.
KFA1/DEL11	Redevelopment, launch and maintenance of breeding program database SPIDNet.
KFA1/DEL12	SpectraCane support and software development for juice laboratories.
KFA1/DEL13	Commercially useful herbicide tolerant lines selected and deregulation dossier draft completed.
KFA1/DEL14	Revision of New South Wales two-year variety selection program.
KFA1/DEL15	Plant Breeder's Rights (PBR) secured for new commercial varieties.
KFA1/DEL16	Clean 'seed' provided to Australian sugarcane industry tissue-culture companies and distribution agencies.
KFA1/DEL17	Ongoing data analysis of breeding and disease screening trials.
KFA1/DEL18	Industry provided with data on a suite of potential new varieties that allows Regional Variety Committees to decide which varieties will be released for commercial production in each region.
KFA1/DEL19	Ongoing maintenance of QCANESelect™ as a useful tool for growers to select varieties.
KFA1/DEL20	Quantitative analysis of mill data for factors affecting productivity and associated targeted adoption strategies.
KFA1/DEL21	Provision of mill area statistics and varietal composition published data and ongoing data support and consultancy to industry.

**PROGRAM 2 – Physiology and trait development:** improve understanding of plant physiology and improve varieties for specific traits.

OUTPUTS for 2017/18	
KFA1/DEL22	Characterisation of high-sucrose clones under field conditions for plant and ratoon crop and methodology for creating high-sugar sugarcane.
KFA1/DEL23	Establishment of canopy temperature and crop vigour based optimal selection index for TCH and CCS.
KFA1/DEL24	New and updated knowledge of sugarcane gene expression, proteins and metabolites.
KFA1/DEL25	Increased knowledge about <i>Pachymetra</i> pathogen for improved disease screening.
KFA3/DEL26	Identification of key morphological traits that are linked to ratooning ability and methodology for stool architecture trait variation.

**PROGRAM 3 – Diagnostics:** improve or develop diagnostics technologies for genetic screening.

OUTPUTS for 2017/18	
KFA1/DEL27	Rapid screening methodology for red rot resistance established.
KFA1/DEL28	Nitrogen response of experimental germplasm determined and tools for rapid screening of sugarcane clones for nitrogen response identified.
KFA1/DEL29	Large-scale field-based germplasm screening and evaluation of phenomics for clone discrimination for nitrogen response.
KFA1/DEL30	Quantitative information on the genetic variation for ammonium/nitrate uptake and use.

**PROGRAM 4 – Fundamental research:** for gene characterisation and editing.

OUTPUTS for 2017/18	
KFA1/DEL31	Monitored advancements in technology for potential application in sugarcane breeding.

The project portfolio and investment in 2017/18 for KFA1 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA1/KPI1	Rate of genetic gain.	2% genetic gain, as measured by final assessment trial (FAT) test clone performance.
KFA1/KPI2	Percent production from new varieties.	Increasing.
KFA1/KPI3	Molecular markers.	Validation of molecular markers for use in breeding program.

## KFA2: Soil health, nutrient management and environmental sustainability

### DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)

Profitability	Safeguarded and improved profitability through optimised use of inputs (particularly nutrients, water and energy) and enhanced soil health and biology that supports sustainable sugarcane production.
Sustainability	Maintained industry social license to operate through sustainable sugarcane production and minimised off-farm impacts.
Capability	Enhanced researcher, grower and advisory sector capability through application of evidence-based research outputs and enhanced partnerships with research organisations, government agencies and natural resource management (NRM) organisations.

### KEY RD&A PRIORITIES

KFA2/PRI1	Integrated and focused soil health program.
KFA2/PRI2	Enhanced SIX EASY STEPS guidelines and nitrogen management.
KFA2/PRI3	Implementation of performance measurement and benchmarking of economic and environmental indicators.

**PROGRAM 1 – Soil health:** improve understanding of soil fertility, soil biology and chemical and physical attributes.

### OUTPUTS for 2017/18

KFA2/DEL1	Use ancillary soil data in conjunction with statistical methods (digital soil mapping) to map individual soil properties and identify constraints to crop production.
KFA2/DEL2	Legume residue best management practices.
KFA2/DEL3	Soil health and soil biology master classes, grower management plans and ongoing support to facilitate practice change.

**PROGRAM 2 – Nutrient management:** improve management of soil resources, nutrients and chemical inputs to reduce nutrient losses and decrease environmental footprint.

### OUTPUTS for 2017/18

KFA2/DEL4	Suite of research and tools to improve nitrogen-use management and address environmental and productivity concerns, including SIX EASY STEPS, NutriCalc and Fertfinder.
KFA2/DEL5	Review of SIX EASY STEPS nitrogen recommendations and updating of industry methods associated with nitrogen fertiliser requirements.
KFA2/DEL6	Ongoing validation of SIX EASY STEPS through investigating the cumulative impacts of nitrogen rates and products on older ratoons.

OUTPUTS for 2017/18	
KFA2/DEL7	Development of a conceptual co-learning tool for the Tully region for future use to operationalise and guide grower use of steps 5 and 6 of the SIX EASY STEPS.
KFA2/DEL8	Improved understanding of the impacts of sodicity, poor drainage or late harvest on nitrogen guidelines.
KFA2/DEL9	Strategic alliance with Queensland Government to support a sound and scientific-based approach to nitrogen research.
KFA2/DEL10	Guidelines and information illustrating the complexity of and factors affecting, the effective use of controlled release fertilisers and conditions under which productivity and environmental benefits might be expected.
KFA2/DEL11	Improved understanding of enhanced efficiency fertiliser management practices on productivity in different sugarcane farming regions.
KFA2/DEL12	A logic framework for enhanced efficiency fertilisers in the Herbert.

**PROGRAM 3 – Climate variability and forecasting:** improve capability to predict and adapt to variable climatic conditions.

OUTPUTS for 2017/18	
KFA2/DEL13	Initial identification of the key climatic and agronomic factors affecting crop performance in the Herbert region.
KFA2/DEL14	Ongoing collaborative research across agricultural research agencies to improve seasonal forecasts and prediction of climatic extremes.

**PROGRAM 4 – Environmental sustainability and social license to farm<sup>3</sup>.**

OUTPUTS for 2017/18	
KFA2/DEL15	Regional and industry-wide measurement and benchmarking of key economic and environmental indicators.

The project portfolio and investment in 2017/18 for KFA2 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA2/KPI1	Soil health.	Identification of key indicators of soil health.
KFA2/KPI2	Adoption of SIX EASY STEPS.	75% of growers use SIX EASY STEPS.
KFA2/KPI3	Economic and environmental indicators to demonstrate impact from transitioning to improved farming systems.	Metrics and data collection established, with benchmarks to be set following analysis of 2017/18 performance data (in collaboration with CSIRO and Queensland Government's Paddock to Reef Programme).

<sup>3</sup> KFAs 1 to 9 also contain projects that contribute to environmental sustainability and social license to operate.



## KFA3: Pest, disease and weed management

DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)	
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.

KEY RD&A PRIORITIES	
KFA3/PRI1	Enhanced biosecurity prevention and preparedness processes.
KFA3/PRI2	Integrated and cost-effective management tools and precision application technologies.
KFA3/PRI3	Continued investigation of the impact, cause(s) and management options for YCS.

**PROGRAM 1 – Biosecurity:** enhance capacity to manage biosecurity risks.

OUTPUTS for 2017/18	
KFA3/DEL1	Coordination and prioritisation of the industry's future biosecurity activities and implementation of the Industry Biosecurity Plan (IBP) in collaboration with industry partners.
KFA3/DEL2	Dossiers, contingency plans, information sheets and national diagnostic protocols reviewed and developed, as per the IBP.
KFA3/DEL3	Exotic moth borers examined for genetic similarity allowing rapid and accurate deoxyribonucleic acid (DNA) based taxonomic identification of exotic moth borers.
KFA3/DEL4	Ongoing biosecurity, entomological and pathological capacity for the Australian sugarcane industry.

**PROGRAM 2 – Pest control:** enhance capability to deal with pests.

OUTPUTS for 2017/18	
KFA3/DEL5	Development of a new generation insecticide.
KFA3/DEL6	Biochar evaluated for end-of-row capture of nutrients and pesticides; first year of comparisons of pesticide formulations and application methods for efficacy and run-off.

**OUTPUTS for 2017/18**

KFA3/DEL7	Greater awareness of growers in the Tully, South Johnston and Mulgrave region of the impact of best management practice when using herbicides and pesticides on off-site movement.
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**PROGRAM 3 – Disease management:** improve disease management strategies and technologies.

**OUTPUTS for 2017/18**

KFA3/DEL8	Selected optimal culture conditions, inoculation methods and primers for a diagnostic test for chlorotic streak disease.
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**PROGRAM 4 – Weed management:** improve weed management strategies and technologies.

**OUTPUTS for 2017/18**

KFA3/DEL9	Herbicide phytotoxicity ratings delivered for new varieties to industry.
KFA3/DEL10	Semi-commercial operational spot spray sensor prototype.

**PROGRAM 5 – Yellow canopy syndrome (YCS):** investigate causal factor(s) and develop management strategies<sup>4</sup>.

**OUTPUTS for 2017/18**

KFA3/DEL11	Causal factor/s as to why YCS affected sugarcane cannot export sucrose from the leaves, including identification of where and when this physiological disorder starts – as it is now evident that yellowing of the leaves is only the final terminal stage of YCS.
KFA3/DEL12	Evaluation of two hypotheses to determine the causal factor/s for compromised water transport in YCS affected sugarcane. Hypothesis 1: Physical blockage to water movement in the vascular tissue. Hypothesis 2: Induced stomatal closure in the leaves reduces the driving force for water movement.
KFA3/DEL13	Determination of the genetic variability in sugarcane for YCS tolerance and the abiotic/environmental factors that trigger symptom expression.
KFA3/DEL14	Evaluation of sucrose and starch as potential diagnostic tools to identify the presence of YCS prior to symptom development.
KFA3/DEL15	Development of strategies to manage the impact of YCS.

The project portfolio and investment in 2017/18 for KFA3 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA3/KPI1	Up-to-date dossiers reflecting current knowledge for high-risk exotic threats.	Reviewed annually.

<sup>4</sup> 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.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA3/KPI2	Adoption of new and/or improved pest management strategies.	At least 20% of growers adopted new and/or improved pest management strategies within last five years.
KFA3/KPI3	Pest and disease screening of clones from various stages of selection programs, parents and foreign clones.	At least 2,000 clones screened annually.

## KFA4: Farming systems and harvesting

### DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)

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.

### KEY RD&A PRIORITIES

KFA4/PRI1	Review and improve uptake of precision agriculture technologies and new farming systems to improve productivity and yield.
KFA4/PRI2	Improve harvesting and cane cleaning efficiency.
KFA4/PRI3	Economic analyses and demonstration of new or improved technology, farm management and decision-support tools.

**PROGRAM 1 – Precision Agriculture (PA):** improve understanding and uptake of PA technologies.

### OUTPUTS for 2017/18

KFA4/DEL1	Economic analysis of the consequences of adopting precision agriculture technologies and farming practices, e.g. laser levelling.
KFA4/DEL2	Collaborative work developing pathways for use of 'Big Data' in agriculture.
KFA4/DEL3	Evaluated tactical nitrogen fertiliser management using proximal sensors.

**PROGRAM 2 – Water management:** improve irrigation and water management.

### OUTPUTS for 2017/18

KFA4/DEL4	Evaluation of existing and potential scheduling tools for improving irrigation efficiency.
KFA4/DEL5	Traits associated with varietal waterlogging tolerance identified through waterlogging trials.
KFA4/DEL6	Case studies of alternative energy integration into irrigation systems.

**PROGRAM 3 – Farming systems:** improve planting systems; crop performance; crop rotations; and on-farm energy efficiency.

### OUTPUTS for 2017/18

KFA4/DEL7	Effect of fallow options on plant cane crops.
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OUTPUTS for 2017/18	
KFA4/DEL8	Improved understanding of marginal soil farm management through investigation of the relationship between application of organic ameliorants at depth and impact on productivity and profitability.
KFA4/DEL9	Potentially beneficial endophyte (microbe) sequences identified as potential technology to augment farming systems productivity, and a technique manual and protocols for importation, isolation and culture of endophytes developed.

**PROGRAM 4 – Harvesting systems and cane cleaning:** improve technology and identify and demonstrate harvesting best practice.

OUTPUTS for 2017/18	
KFA4/DEL10	Ongoing collaborative work with industry partners addressing mechanical harvest losses through research, technology and adoption.
KFA4/DEL11	Measurements of cane losses with different configurations of harvester chopper drums.
KFA4/DEL12	Calibration of the real-time harvest decision-making tool (SCHLOT) and ongoing demonstration to industry.
KFA4/DEL13	Development and testing of machinery modifications to minimise stool damage and cane loss during harvesting.
KFA4/DEL14	Economic evaluation of post-harvest cane cleaning.
KFA4/DEL15	Design, build and testing of larger cane cleaner test rig that can process 150 TCH.
KFA4/DEL16	Quantification and demonstration of cane losses and harvesting best practice efficiencies to approximately 10% of harvesting groups industry-wide.

The project portfolio and investment in 2017/18 for KFA4 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA4/KPI1	Productivity impact from adoption of new farming practices and/or technology.	Positive input-output efficiency ratios, demonstrated through case-studies.
KFA4/KPI2	Adoption of new farming practices and/or technology.	At least 70% of growers producing more than 7,000 tonnes per annum adopted new practices and/or technology over two-year period.
		At least 50% of growers producing less than 7,000 tonnes per annum adopted new practices and/or technology over two-year period.
KFA4/KPI3	Adoption of harvesting best practices.	10% increase in harvesting best practice demonstration sites.

## KFA5: Milling efficiency and technology

### DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)

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.

### KEY RD&A PRIORITIES

KFA5/PRI1	New technology for improved processing efficiency.
KFA5/PRI2	Improved energy efficiency and waste minimisation.
KFA5/PRI3	Enhanced milling knowledge transfer and capability.

**PROGRAM 1 – Cane quality and transport:** optimise mill transport and improve cane quality to mills.

### OUTPUTS for 2017/18

KFA5/DEL1	Real-time scheduling software upgraded to provide marshalling yard and depot support.
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**PROGRAM 2 – Sugar quality:** improve sugar quality.

### OUTPUTS for 2017/18

KFA5/DEL2	A standardised protocol for industry for the use of rapid analysis methodologies and supporting documentation to aid adoption.
KFA5/DEL3	Crystallisation practice and equipment knowledge for improvements in sugar quality.
KFA5/DEL4	Development of near infrared (NIR) spectroscopic models and commercial NIR instruments to measure nutrients in mill mud online.
KFA5/DEL5	Ongoing NIR software support to mills and certification of NIR methods for cane payments.

**PROGRAM 3 – Mill operations:** improve mill processing efficiency and mill capacity utilisation.

### OUTPUTS for 2017/18

KFA5/DEL6	Provision of cane analysis system (CAS) sugar factory support.
KFA5/DEL7	Recommendations for rotor hammer configurations in existing shredders.

OUTPUTS for 2017/18	
KFA5/DEL8	Ongoing testing of coating material for wear and corrosion resistance to reduce boiler maintenance costs.
KFA5/DEL9	Methods developed for sampling and analysing juices, condensates and vapours in sugar factories.
KFA5/DEL10	Completed assessment of 'time-of-flight technology' for the purposes of evaporator product density measurement and control in Australian sugar mills.
KFA5/DEL11	Delivery of historical production data in a standardised and spatial format to mills.

**PROGRAM 4 – Step-changing projects:** development of new mill processes and technology.

OUTPUTS for 2017/18	
KFA5/DEL12	A blueprint for new processing technologies for Australian sugar factories.

**PROGRAM 5 – Energy efficiency:** improve cost-efficiency in the use of energy.

OUTPUTS for 2017/18	
KFA5/DEL13	Assessment of Falling film tube evaporators and Kestner evaporators, including cleaning procedures and suitability for configurations providing major reductions in steam consumption relative to Robert evaporators.

**PROGRAM 6 – Knowledge transfer and adoption:** improve extension, communication, information and technology transfer and adoption.

OUTPUTS for 2017/18	
KFA5/DEL14	Scoping study on milling research and capability extension services to communicate and transfer research outputs.
KFA5/DEL15	Existing sugar milling operations training material loaded into new learning management system and system trailed with users.
KFA5/DEL16	Development of a back-end simulator and training package for boiler systems, including a generic interface and user manual.

The project portfolio and investment in 2017/18 for KFA5 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA5/KPI1	Adoption of improved or novel milling processes and technology.	All milling groups aware of available new processes and technology.
KFA5/KPI2	Adoption of laboratory NIR systems.	50% of sugar mills adopted NIR new systems.
KFA5/KPI3	Miller satisfaction with SRA milling research and services.	Average rating of at least 4 out of 5 achieved by 2022.

## KFA6: Product diversification and value addition

DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)	
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.

KEY RD&A PRIORITIES	
KFA6/PRI1	Prioritised diversification opportunities for further R&D activity or market analysis.
KFA6/PRI2	New knowledge on platform technologies for the conversion of sugarcane biomass into value-added fuels, chemicals and feedstocks.

**PROGRAM 1 – Enhancing value:** identification of new opportunities for new products or uses for sugarcane.

OUTPUTS for 2017/18	
KFA6/DEL1	Exploration of prioritised diversification opportunities for the Australian sugarcane industry.
KFA6/DEL2	Pilot plant testing for the production of paper pulp from bagasse.
KFA6/DEL3	Laboratory-scale development and assessment of enzyme technologies and pilot-scale demonstration of new feed ingredient technologies from sugarcane bagasse.
KFA6/DEL4	Pilot-scale production of bio-oils from molasses.
KFA6/DEL5	Understanding of impact of the factors involved in promoting or constraining diversification opportunities in the Australian sugar milling sector.

The project portfolio and investment in 2017/18 for KFA6 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA6/KPI1	Identification of new opportunities in product diversification and innovation.	Bio-refinery opportunities identified and prioritised.

## KFA7: Knowledge and technology transfer and adoption

### DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)

Profitability	Increased profitability through efficiencies and production optimisation along the value chain resulting from uptake of new knowledge, technology and/or practice change.
Sustainability	Enhanced sustainability through increased uptake of sustainable technology and practices that improve soil health, water quality, energy efficiency and waste minimisation.
Capability	Increased industry capability through enhanced relationships between researchers, industry and advisory sector effecting appropriate and timely knowledge transfer of latest research and development outcomes.

### KEY RD&A PRIORITIES

KFA7/PRI1	New strategy targeting industry knowledge transfer and adoption needs, problems and solutions.
KFA7/PRI2	Enhanced communication strategies and tools that synchronise with research and adoption activities.
KFA7/PRI3	Monitoring and evaluation of industry adoption and practice change.

**PROGRAM 1 – Knowledge transfer and adoption:** establish a contemporary strategy and regionally-based partnerships to promote awareness and uptake of new research knowledge and technology.

### OUTPUTS for 2017/18

KFA7/DEL1	Industry-supported and regionally-tailored strategies for collaborative facilitation of technology transfer and practice change.
KFA7/DEL2	Regionally-tailored training 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.
KFA7/DEL3	Suite of technical resources that assist the extension and advisory sector to work with growers and millers to enhance productivity and profitability.
KFA7/DEL4	Release of innovative communication tools, including: smart phone applications; online tools; periodical newsletters; and integration of communication technology into existing farming landscape of machinery, technology and information access.
KFA7/DEL5	Enhanced eLibrary with improved accessibility to research reports and papers.
KFA7/DEL6	Publication and promotion of annual Grower and Miller Surveys.
KFA7/DEL7	Publication and promotion of evidence-based case studies, impact assessments, evaluations and performance reports.

**PROGRAM 2 – Business performance:** improve farm business and risk management decision making.

OUTPUTS for 2017/18	
KFA7/DEL8	Ongoing extension of farm business intelligence data with industry to improve business performance and business planning skills.
KFA7/DEL9	Adoption activity and practice change measurement framework to assess and monitor the impact of SRA’s adoption activities and research outcomes for growers and millers.
KFA7/DEL10	Provision of economic and life-cycle analysis case studies demonstrating profitability and environmental impacts of adoption of Smartcane best management practices (BMP).

The project portfolio and investment in 2017/18 for KFA7 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA7/KPI1	Productivity impact from adoption of new farming practices and/or technology.	Positive input-output efficiency ratios, demonstrated through case-studies.
KFA7/KPI2	Adoption of new farming practices and/or technology.	At least 70% of growers producing more than 7,000 tonnes per annum adopted new practices and/or technology over two-year period.
		At least 50% of growers producing less than 7,000 tonnes per annum adopted new practices and/or technology over two-year period.
KFA7/KPI3	Grower and miller satisfaction with SRA adoption and communication activities.	Average rating of 3.5 (or above) out of 5.



## KFA8: Collaboration and capability development

### DESIRED IMPACTS (as identified in SRA's 2017/18 – 2021/22 Strategic Plan)

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

### KEY RD&A PRIORITIES

KFA8/PRI1	Leveraged industry, government and research partnerships and collaborations.
KFA8/PRI2	Future mapping of industry's long-term vision, challenges and opportunities.
KFA8/PRI3	Enhanced human capability programs.

### PROGRAM 1 – Sectoral and cross-sectoral collaboration.

#### OUTPUTS for 2017/18

KFA8/DEL1	<p>Support and participation in cross-sectoral research and development activities, including:</p> <ul style="list-style-type: none"> <li>• Soils;</li> <li>• Nitrogen use efficiency;</li> <li>• Novel fertilisers and feed;</li> <li>• Pesticide applications;</li> <li>• Climate change and managing climate variability;</li> <li>• Plant biosecurity;</li> <li>• AgVet chemicals;</li> <li>• Precision agriculture;</li> <li>• Water use in agriculture;</li> <li>• Seasonal forecasting;</li> <li>• Irrigation;</li> <li>• Mechanical harvesting;</li> <li>• Biofuels, energy and biorefineries;</li> <li>• Adoption and extension services;</li> <li>• Impact assessment;</li> <li>• Primary industries health and safety; and</li> <li>• Australian Rural Leadership Program.</li> </ul>
KFA8/DEL2	Participation in Council of Rural Research and Development Corporations (CRRDC) working groups and activities.
KFA8/DEL3	Implementation of the National Sugarcane Industry RD&E Strategy.
KFA8/DEL4	Memorandums of Understanding with other research organisations to exchange knowledge and research material.

**OUTPUTS for 2017/18**

KFA8/DEL5	Industry vision-setting and Futures Forum initiatives.
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**PROGRAM 2 – Scholarships:** enhance research capacity through recognised training.

**OUTPUTS for 2017/18**

KFA8/DEL6	Postgraduate research scholarship program to develop and enhance long-term industry research capacity.
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**PROGRAM 3 – Sugarcane Industry Travel and Learning Awards (STLA):** travel and learning to enhance innovation capacity.

**OUTPUTS for 2017/18**

KFA8/DEL7	Travel and learning awards to promote the search and development of new industry research, development and adoption ideas.
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**PROGRAM 4 – Training to enhance qualifications and skills:** workshops; Early Career Researcher (ECR)/Mid-Career Researcher (MCR) Awards; and leadership.

**OUTPUTS for 2017/18**

KFA8/DEL8	Early and mid-career researcher award program to develop and enhance long-term industry research capacity.
KFA8/DEL9	Young Industry Participants Development Program and annual forum.
KFA8/DEL10	Development and delivery of schemes to provide training for undergraduate scholars in engineering and research.
KFA8/DEL11	Existing sugar milling operations training material loaded into new learning management system and system trailed with users.

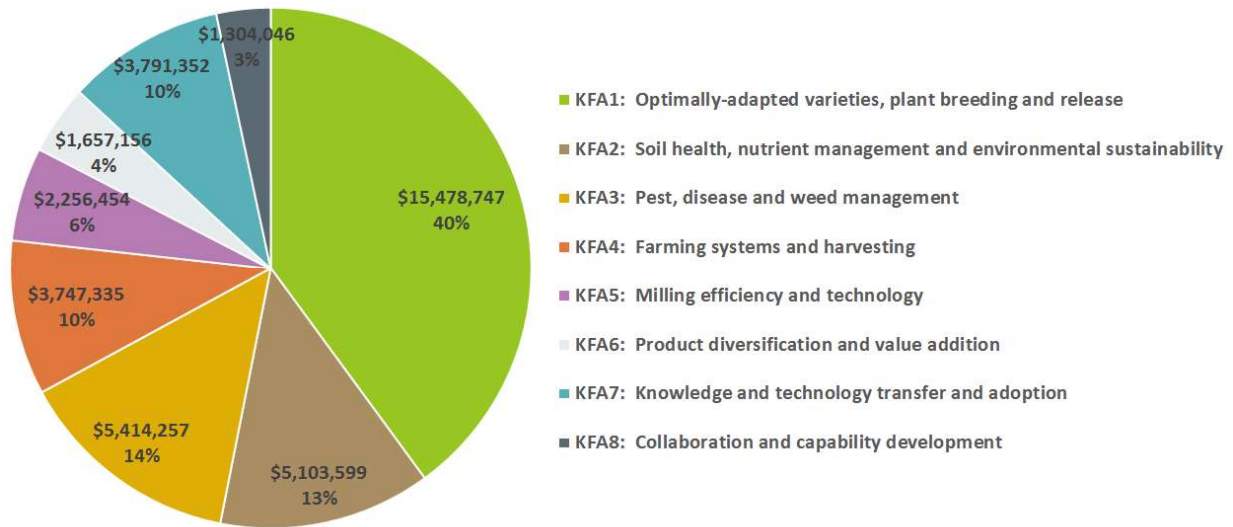
The project portfolio and investment in 2017/18 for KFA8 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA8/KPI1	SRA participation and investment in relevant collaborative and cross-sectoral programs, including the Commonwealth's Rural R&D for Profit Programme.	Ongoing contribution and support.
KFA8/KPI2	Scholarships awarded to current and future industry participants.	Minimum of four postgraduate scholarships and two early-career research awards.
KFA8/KPI3	Short-term placements of students and/or professionals in research or industry positions for industry exposure.	At least two placements.

## 4.2. Investment across RD&A focused KFAs

The total expenditure for 2017/18 across the eight RD&A focused KFAs is \$38.75m. Figure 2 details the expenditure allocation across the RD&A KFAs.

**Figure 2: RD&A expenditure across KFAs**



Attachment 2 provides a breakdown of KFA expenditure by projects.

## 5. CENTRALLY-MANAGED RESEARCH FUNCTIONS AND CORPORATE SUPPORT

SRA's eight RD&A focused KFAs are actively supported by centrally-managed research functions and corporate support services which are collated under KFA9.

### KFA9: Organisational effectiveness

DESIRED IMPACTS (as identified in SRA's 2017/18 - 2021/22 Strategic Plan)	
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, reducing 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.

KEY RD&A PRIORITIES	
KFA9/PRI1	Ongoing engagement with investors to ensure their RD&A needs are being met.
KFA9/PRI2	Enhance investment framework to optimise returns on investment.
KFA9/PRI3	Continue to strengthen organisational culture, capability, governance and facilities to support management and delivery of SRA's RD&A portfolio.

**PROGRAM 1 - Culture:** embed investor-centric and performance-driven values and culture across SRA.

OUTPUTS for 2017/18	
KFA9/DEL1	Continued implementation of cultural transformation program, including: annual workshops; bi-annual culture and values assessment; and ongoing leadership development.
KFA9/DEL2	Improved communication mechanisms to enable vertical and horizontal communication within the organisation, including: improved intranet content; regular staff updates from the Board and Executive Team; rotating Executive and staff at various team meetings; inter-team meetings; and SRA-wide teleconferencing.
KFA9/DEL3	Revised administrative systems to remove unnecessary duplication and streamline processes.
KFA9/DEL4	Development of 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.

**PROGRAM 2 – People:** attract, retain and develop a first-class workforce.

OUTPUTS for 2017/18	
KFA9/DEL5	People management planning and appraisal, including: talent management and succession plans; employee performance plans and mid-year performance appraisals; and benchmarking of employee remuneration and entitlements.
KFA9/DEL6	Human resources (HR) and workplace health, safety and environmental management, framework and system improvements, reporting and support services.

**PROGRAM 3 – Workplace:** optimise facilities, systems and processes to support leading-edge RD&A that meets the needs of our investors.

OUTPUTS for 2017/18	
KFA9/DEL7	Investor engagement and communication, including regular scheduled consultation between SRA and grower and miller Delegates, industry representative bodies and government investor representatives.
KFA9/DEL8	Monitoring and evaluation system embedded to support Board and investor reporting on RD&A outputs, outcomes and impacts, including publication of Annual Performance Report.
KFA9/DEL9	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.
KFA9/DEL10	Contemporary and compliant finance, governance and operational strategies, management plans, systems, processes and reporting.
KFA9/DEL11	Internal audit reviews (as per Internal Audit Plan), including: <ul style="list-style-type: none"> <li>• Acquittals – Research Funding Unit managed;</li> <li>• Core Information Technology processes – network and perimeter;</li> <li>• Payroll;</li> <li>• Procure to pay;</li> <li>• Project funding process and controls – Research Funding Unit/Panel; and</li> <li>• Treasury management.</li> </ul>
KFA9/DEL12	Intellectual property (IP) management system for identification and ongoing management of current and future IP generated through SRA’s R&D portfolio.
KFA9/DEL13	Information technology (IT) strategy and platforms that support research activities, staff mobility and connectivity across SRA workplaces, including: storage and infrastructure capacity for collation and analysis of large data sets (‘Big Data’); records management; portable devices; mobile applications; video-conferencing; and web-enabled facilities.
KFA9/DEL14	Asset management planning and systems, including: maintenance, refurbishment or redevelopment (e.g. Bundaberg research station and Indooroopilly quarantine facilities); best-practice certification for research station and farm management.

The project portfolio and investment in 2017/18 for KFA9 is provided in Attachment 2.

KEY PERFORMANCE INDICATORS		TARGETS for 2017/18
KFA9/KPI1	Investor performance rating for SRA.	Increase from 74% 'high' (2016) to 85% by 2022.
KFA9/KPI2	Economic, social and environmental returns from RD&A investments.	Aggregated research investment benefit-cost ratio of 4:1 or above by 2022.
KFA9/KPI3	Governance performance.	Maintain 100% compliance with statutory and contractual requirements.



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## 6. INVESTMENT APPROACH

### 6.1. Collaboration 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.

SRA works in partnership with leading Australian organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), universities, government and other industry groups such as regional productivity services, growers, millers, harvesting contractors and manufacturers, and NRM organisations. We also partner with the private sector (both within Australia and internationally) and international sugarcane breeding and research organisations to create collaborative research opportunities and variety exchange programs that will benefit the Australian sugarcane industry.

SRA also partners with other RDCs to invest in and/or support mutually-beneficial collaborative research, including participation in cross-sectoral strategy areas under the National Primary Industries RD&E Framework and a suite of projects under the Australian Government's Rural R&D for Profit Programme. In addition, SRA actively participates in CRRDC projects, working groups and other activities.

Strategic partnerships and joint investment in advanced technologies and agricultural practices are an important part of our investment strategy. During 2017/18, SRA will continue to expand and strengthen relationships and collaborative alliances with:

- sugarcane research counterparts overseas, especially with research institutes in India, China and Brazil;
- private sector partnerships to catalyse the development and commercialisation of cutting-edge technology and research outputs;
- productivity services organisations, advisory sector and NRM organisations to accelerate up-take of research outcomes and new technology; and
- other RDCs both in terms of knowledge sharing and learning and in co-investment in cross-sectoral research program.

During 2017/18 SRA will also work closely with industry and research providers on the implementation of the National Sugarcane Industry RD&E Strategy, which SRA co-leads with the Queensland Department of Agriculture and Fisheries. SRA will continue to play a leading role in the governance, development and management of the Strategy.

### 6.2. Balanced portfolio

SRA is committed to ensuring it invests, manages and participates in a balanced portfolio of research, development and adoption 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;
- Invest in short, medium and long-term projects across the research pipeline;
- Appropriately manage RD&A risk-profile, with a combination of low-risk projects targeting incremental improvements and higher-risk transformational projects;
- Leverage investment through collaboration; and
- Maximise return for our investors.

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.

## 7. PERFORMANCE MONITORING AND EVALUATION

SRA has established an “impact pathway” framework to support performance monitoring and evaluation across its RD&A portfolio. This program logic-based model traces research inputs through to outputs, outcomes and ultimately, industry impacts.

Such line-of-sight allows SRA to improve the monitoring, evaluation and reporting of SRA’s RD&A portfolio under its Monitoring and Evaluation (M&E) Framework and provides pathways towards quantifying attributable impact and return on investment for our industry and government investors.

SRA’s M&E Framework has been further strengthened with the development and implementation of a new suite of key performance indicators (KPIs) and tangible targets that will be progressed and monitored through Annual Operational Planning and reporting mechanisms.

In addition to monitoring and reporting against a set of KPIs for each of SRA’s key focus areas, SRA has identified a set of core measures to demonstrate the contribution of SRA RD&A activities to industry profitability and sustainability, and the return on investment these activities deliver to our industry and government investors. Table 2 details SRA’s core measures of success and associated KPIs.

**Table 2: SRA’s core measures of success**

Core measure	Key performance indicators
1. Increased profitability	Net profit per tonne of sugar produced.
2. Improved industry sustainability	<p>Economic:</p> <ul style="list-style-type: none"> <li>• Yield (tonnes, CCS).</li> <li>• Profit (per hectare, per tonne and per CCS).</li> </ul> <p>Environmental:</p> <ul style="list-style-type: none"> <li>• Nutrient use and water quality benchmarks.</li> <li>• Adoption of BMP.</li> </ul> <p>Social:</p> <ul style="list-style-type: none"> <li>• Workforce capability.</li> </ul>
3. High-impact return on investment	Economic, environmental and social impact assessments, including cost-benefit analyses.

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SRA is currently implementing data collection and monitoring processes and tools to specifically measure and track (over the short, medium and long-term) adoption of new technology, practice change and the impact and/or economic value created through the application of our research. As this performance data becomes available, it will be incorporated into SRA's KPIs and reporting.

The primary monitoring, evaluation and reporting mechanisms within SRA's M&E Framework include:

- Project milestone reporting to the RFU;
- Regular traffic light reporting to the Board on output delivery and achievement against KPIs;
- Operational (financial, workplace health and safety, and risk management) and strategic reporting to the Board's Audit and Risk Committee;
- Six-monthly exception reporting to the Board on progress against the Strategic Plan;
- Reports on performance to the Department of Agriculture and Water Resources via six-monthly meetings;
- Project and program evaluations, including impact and cost-benefit analyses;
- Annual grower and miller surveys, including practice change and satisfaction with SRA;
- Annual Reports and Annual Performance Reports published to demonstrate the performance of SRA's RD&A portfolio and return on investment provided to SRA's industry and government investors; and
- Independent Performance Reviews, as required under the Statutory Funding Agreement.

SRA will continue to regularly communicate with our investors and other stakeholders on our strategic and operational performance and use feedback on our performance to enhance the quality of our research and investment processes, programs and activities.

## 8. INCOME AND EXPENDITURE FORECAST

SRA's Board-approved forecast income and expenditure for 2017/18 are summarised in Table 3. These figures are estimates only. 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.

	2017/18
Operating income	\$k
Industry contribution (statutory levy) <sup>5</sup>	23,800
Commonwealth Government co-investment <sup>6</sup>	7,200
Queensland Government co-investment <sup>7</sup>	3,309
Collaboration/Service Fee income <sup>8</sup>	4,500
Interest	992
Other	1,330
<b>Operating income total</b>	<b>41,132</b>
<b>R&amp;D</b>	
External contestable <sup>9</sup>	11,023
Internal contestable	9,952
Internal core <sup>10</sup>	11,744
Industrial contract research	3,342
Research Adoption <sup>11</sup>	2,692
R&D centrally managed <sup>12</sup>	4,875
<b>R&amp;D total</b>	<b>43,628</b>
<b>Corporate</b>	
Board and investor relations	1,160
Corporate support <sup>13</sup>	2,115
<b>Corporate total</b>	<b>3,275</b>
<b>Operating expenditure total</b>	<b>46,903</b>
<b>SRA operating result for the year</b>	<b>(5,771)</b>

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 our portfolio and achieve these outcomes, SRA is estimating an operating deficit in 2017/18. This deficit will be covered by SRA's accumulated financial reserves.

<sup>5</sup> Assumes crop production of 34 million tonnes for 2017 season.

<sup>6</sup> Commonwealth co-investment made under the 2017-2022 Statutory Funding Contract between SRA and the Commonwealth Government, administered by the Department of Agriculture and Water Resources.

<sup>7</sup> Includes \$2.85m Department of Agriculture and Fisheries contribution and Department of Environment and Heritage Protection's Nitrogen collaborative project income.

<sup>8</sup> Includes \$561k from Rural R&D for Profit Programme.

<sup>9</sup> Includes (\$400k) for milestones in current year that complete in following year.

<sup>10</sup> Internal core includes plant breeding, biosecurity and plant health.

<sup>11</sup> Research adoption includes adoption and communications.

<sup>12</sup> Includes research funding management, research stations and resources, and research KFA management.

<sup>13</sup> Includes Finance, IT, HR, Library and IP.

## ATTACHMENT 1 – Alignment of SRA’s KFAs to industry and government priorities

Stakeholder priorities	SRA key focus areas								
	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
<b>National Sugarcane Industry RD&amp;E Strategy – Themes<sup>14</sup></b>									
1. Products: Expanding uses for sugarcane									
2. Productivity: Achieving significant productivity gains and increasing adoption									
3. Stewardship: Improving environmental performance and industry’s social license									
4. People: Building the capability of industry and research									
<b>National Science and Research Priorities<sup>15</sup></b>									
5. Food									
6. Soil and water									
7. Transport									
8. Cybersecurity									
9. Energy									
10. Resources									
11. Advanced manufacturing									
12. Environmental change									
13. Health									

<sup>14</sup> National Sugarcane Industry RD&E Strategy, 2017.

<sup>15</sup> National Science and Research Priorities, Australian Government, 2015.

Stakeholder priorities	SRA key focus areas								
	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
<b>Rural RD&amp;E Priorities<sup>16</sup></b>									
14. Advanced technology									
15. Biosecurity									
16. Soil, water and managing natural resources									
17. Adoption of R&D									
<b>Queensland Department of Agriculture and Fisheries – Theme Areas for Sugarcane Research Investment<sup>17</sup></b>									
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									

<sup>16</sup> Rural RD&E Priorities, Agricultural Competitiveness White Paper, Australian Government, 2015.

<sup>17</sup> Department Strategic Objectives for funding projects for SUGARCANE, Queensland Department of Agriculture and Fisheries, 2017.



## ATTACHMENT 2 – Project portfolio and investment by KFA

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

- C SRA – SRA provider/RFU contracted projects;
- C Ext – external provider/RFU contracted projects;
- CRP – collaborative research project; and
- SRA – SRA core research, development, adoption and corporate support projects.

### KFA1: Optimally-adapted varieties, plant breeding and release

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2008801	Herbicide resistant sugarcane.	CRP	1,226
2012351	Improving the accuracy of selection in sugarcane breeding trials through accounting for site variability.	C SRA	161
2013022	Exploiting introgression for the development of productive and regionally adapted varieties for New South Wales.	CRP	54
2013030	Applying the genome sequence for variety improvement: validation and implementation.	C Ext	80
2014069 / 2014801	Field assessment and further development of high-sucrose sugarcane.	CRP	146
2015002 / 2015805	Sugarcane root systems for increased productivity, development and application of a root health assay.	CRP	265
2015004	Impact of stool architecture on ratooning ability.	C Ext	231
2015016	Leaf sucrose: the link to diseases such as YCS and enhancement of sugarcane productivity.	C SRA	646
2015025 / 2015809	Generation of a high throughput SNP chip for introgression of resistance genes from wild germplasm into sugarcane, targeting Smut, <i>Pachymetra</i> and nematodes, to generate more resistant varieties faster.	CRP	252
2015026 / 2015808	Selecting high-value chromosomes from wild introgression material to deliver more resistant varieties faster.	CRP	261
2015027	The Sugarcane Hub, development of an interface between the Sugarcane genome sequence and sugarcane genetic data to allow researchers to identify genes that underpin important agronomic traits.	C Ext	80

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2016028	Improving early stage selection of SRA breeding program by indirect selection of plant vigour.	C SRA	312
2016032	Optimising productivity, variety recommendations and mill operations through analysis of mill data.	C SRA	213
2016039	New approaches to identify and integrate <i>Pachymetra</i> resistance genes from <i>Erianthus</i> into SRA breeding program.	C SRA	207
2016044	Licence to farm: nitrogen use efficient varieties to meet the future environmental targets.	C SRA	488
2016803	AISRF: Genetic control and genomic selection for important traits in sugarcane.	CRP	405
2017001	Reviewing and extending knowledge of fibre quality assessment and effects of cane varieties.	C Ext	253
2017002	Implementing and validating genomic selection in SRA breeding programs to accelerate improvements in yield, commercial cane sugar, and other key traits.	C Ext	230
ANADATA	Statistical analysis of data.	SRA	252
BIODTLY / BIODWFD	Development of resistant varieties.	SRA	638
PLANBKN / PLANCEN / PLANHBT PLANNSW / PLANNTN / PLANSTH	Plant breeding - core selection.	SRA	6,728
PLANCRO	Plant breeding - crossing.	SRA	553
PLANGEN	Plant breeding - introgression.	SRA	149
PLANINT	Plant breeding - integrated database and crossing systems.	SRA	166
PLANLAB	Laboratory.	SRA	29
PLANMGT	Breeding management.	SRA	642
PLANPAC	Redefining <i>Pachymetra</i> root rot management strategies and varietal resistance in commercial fields.	SRA	220
PLANPBR	Plant Breeder's Rights.	SRA	71

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
PLANQCS	QCANESelect Support.	SRA	41
PLANSPE	Spectracane Support.	SRA	156
PLANVPD	Variety Propagation and Distribution.	SRA	325
<b>Total Investment KFA1</b>			<b>15,479</b>

#### KFA2: Soil health, nutrient management and environmental sustainability

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2013101	Strategies to manage soil-borne fungi and mitigate sugarcane yield decline.	C Ext	299
2014004 / 2015801	Regenerating a soil food web capable of improving soil health and reducing losses from soil-borne pests and pathogens of sugarcane.	CRP	33
2014011	Role of controlled release fertiliser in Australian sugarcane systems.	C Ext	100
2014045	Boosting nitrogen-use efficiency in sugarcane through temporal and spatial management options.	CRP	399
2015065	Improving nitrogen-use efficiency for sugarcane crops with constrained yield potential.	C SRA	256
2015069	Decision support for informed nitrogen management: soil nitrogen mineralisation test and the assessment of soil crop nitrogen contribution to crop nitrogen requirements.	C Ext	97
2015070	Spatially explicit estimation of achievable yield potential – an improved basis for fertiliser management.	C Ext	23
2015074	Improving management practices of legume crop residues to maximise economic and environmental benefits.	C Ext	203
2015075 / 2015807	How big will that crop be? Incorporating climate forecasting into nitrogen management in the Wet Tropics.	CRP	205
2015905	Waste to revenue: novel fertilisers and feeds.	C Ext	31

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2015907	More profit from nitrogen: enhancing the nutrient use efficiency on intensive cropping and pasture systems.	C Ext	318
2016804	Complete nutrient management planning for cane farming.	CRP	8
2016805	Improved water quality outcomes from on-farm nitrogen management.	CRP	45
2016807	Reef Trust 4 - cane farmer trials of enhanced efficiency fertiliser in the catchments of the Great Barrier Reef.	CRP	1,581
2017004	SIX EASY STEPS - continuing perspectives in time and space.	C Ext	315
2017005	Measuring soil health, setting benchmarks and driving practice change in the sugar industry.	C SRA	722
2017009	Unravelling the impact of climate and harvest time on nitrogen fertiliser requirements.	C SRA	326
2017803	Enhanced adoption of SIX EASY STEPS nitrogen recommendations.	CRP	143
<b>Total Investment KFA2</b>			<b>5,104</b>

### KFA3: Pest, disease and weed management

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2013802	Australian Centre for International Agricultural Research (ACIAR) - integrated disease management for sugarcane streak mosaic in Indonesia.	CRP	300
2014049	Solving YCS.	C SRA	792
2014050	Developing an alternative herbicide management strategy to replace PSII herbicides in the Wet Tropics area.	C SRA	121
2014082	A novel polyphasic framework to resolve YCS paradox.	C Ext	131
2014086	Validation of leaf sheath biopsies-polymerase chain reaction (LSB-PCR) diagnostic for ratoon stunting disease and characterisation of non-Lxx strains of <i>Leifsonia</i> associated with sugarcane.	CRP	10

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2015046	Securing Australia from Papua New Guinea biosecurity threats.	C SRA	177
2015055 / 2015815	Field ready, optimised precision weed identification and spray system.	CRP	396
2015804	Soldier fly management	CRP	67
2015810 – 2015814	Screening.	CRP	88
2016003	Identifying new-generation insecticides for canegrub control as contingency for loss of amenity with the existing product.	C SRA	363
2016041	You can't manage what you can't identify – managing threats from exotic moth borers through accurate identification.	C SRA	105
2016047	Molecular assay of major soil-borne pathogens for better exploitation of commercial varieties.	C SRA	138
2016064/ 2016806	Investigation of biotic causes of YCS.	CRP	543
2017008	Keeping chemicals in their place – in the field.	C SRA	418
2017010	Delivering solutions for chlorotic streak disease.	C SRA	229
2017801	Cane to creek: Russell Mulgrave growers and the nitrogen story.	CRP	43
2017951	Biosecurity (Rural R&D for Profit Programme).	CRP	185
BIOBRSD	Development for an improved commercial assay for ratoon stunting disease (RSD).	SRA	229
BIOEBBG / BIOEMER / BIOEMKY	Biosecurity entomology.	SRA	62
BIOPIND / BIOPTLY / BIOPWFD	Biosecurity pathology.	SRA	267
BIOQUAR	Quarantine pathology.	SRA	297
BIORSDL	RSD laboratory.	SRA	144
BIOSMGT	Biosecurity management.	SRA	13
BIOSPLY	Soil pathogen laboratory.	SRA	136

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
PHEAMGT	Plant health management.	SRA	160
<b>Total Investment KFA3</b>			<b>5,414</b>

#### KFA4: Farming systems and harvesting

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2014035	A non-pneumatic cane cleaning system with no cane loss.	C Ext	193
2014046	Too wet to forget - reducing the impact of excessive rainfall on productivity.	C SRA	58
2014048	Increased harvest recovery: reducing sugar loss and stool damage.	C SRA	284
2014079	Modernisation of furrow irrigation in the sugar industry.	C Ext	20
2014094	Demonstration of global positioning system (GPS) guided laser levelling and its associated productivity response.	C Ext	3
2015007	Assessment of new management strategies and varieties for marginal soils.	C SRA	339
2015051 / 2015802	Bio-prospecting for beneficial endophytes of sugarcane.	CRP	458
2016062	Remote sensing platform for precision agriculture.	C Ext	378
2016951	Development of an intelligent tool to allow real time evaluation of harvesting practices as part of a framework for improved harvester payment systems.	CRP	236
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.	CRP	451
2016953	Commercial scale economic evaluation of post-harvest cane cleaning to maximise the returns to the supply chain.	CRP	389
2016955	Adoption of practices to mitigate harvest losses.	CRP	630
2017012	Southern sugar solutions.	C Ext	75



PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2017014	Seeing is believing: managing soil variability, improving crop yield and minimising off-site impacts in sugarcane using digital soil mapping.	C Ext	89
2017793	Harvest losses (future investment placeholder).	C SRA	143
<b>Total Investment KFA4</b>			<b>3,747</b>

#### KFA5: Milling efficiency and technology

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2012054	Determine the optimum tube dimensions for Robert evaporators through experimental investigations and modelling.	C Ext	9
2013060	Reducing the maintenance costs of mill rolls.	C Ext	8
2014037	Real-time harvest and transport system.	C Ext	166
2014051	Improving mill efficiency through rapid analysis methodologies.	CRP	96
2014052	Managing aspects of raw sugar quality in the Australian sugar industry.	CRP	127
2015013 / 2015806	Investigation into modifying pan boiling techniques to improve sugar quality.	CRP	382
2015018	Increasing capacity to undertake cane preparation research through modelling and experimentation,	C Ext	26
2015043	Develop a blueprint for the introduction of new processing technologies for Australian factories.	C Ext	58
2016019	Developing online analysis systems to measure the available nutrients in mill mud.	C SRA	241
2016020	Reducing boiler maintenance costs and deferring capital expenditure through improved technology.	C Ext	82
2017003	Evaporator liquor brix sensor.	C Ext	27
2017006	Managing aspects of raw sugar quality in the Australian sugar industry – Part II.	C Ext	419
2017007	Investigations to mitigate the effects of sucrose degradation and acid formation in factory	C Ext	149

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
	evaporators on sugar recovery and quality, corrosion and effluent loadings.		
NIRDMER	NIR at Meringa.	SRA	134
PLANCAS	CAS Service and Support.	SRA	332
<b>Total Investment KFA5</b>			<b>2,256</b>

#### KFA6: Product diversification and value addition

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2012053	Process for making bagasse paper pulp.	C Ext	87
2015902	A profitable future for Australian agriculture: bio-refineries for higher-value animal feeds, chemicals, and fuels.	C Ext	1,325
2016801	Australian Research Council (ARC) linkage project: manipulation of carbon partitioning to enhance the value of sugarcane.	CRP	95
2017791	Nutrition research (future investment placeholder).	C Ext	150
<b>Total Investment KFA6</b>			<b>1,657</b>

#### KFA7: Knowledge and technology transfer and adoption

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2014001	Increasing farm business intelligence within the sugar industry.	C Ext	5
2014015	Measuring the profitability and environmental implications when growers transition to BMP (as defined by Smartcane BMP).	C Ext	67
2015045	Sugar industry productivity and data recording spatial data hub for research and extension.	C Ext	28
2015082	Evaluation of scheduling tools for the sugar industry.	CRP	14

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2015906	Stimulating private sector extension in Australian agriculture to increase returns from R&D.	C Ext	20
2016001	A boiler simulator for improving operator training.	C Ext	112
2016002	Protecting our chemicals for the future through accelerated adoption of best management practice.	C SRA	412
2016025	Master classes in soil health/soil biology for the sugar industry.	C Ext	121
2017011	Productivity improvements through energy innovation in the Australian sugar industry.	C Ext	140
2017792	Adoption outcomes (future investment placeholder).	C SRA	143
2017802	Smarter Irrigation.	CRP	37
COMMMGR	SRA communications, marketing and graphic design.	SRA	793
EXECPEC	Executive management - research adoption.	SRA	38
PECCOMM	Research adoption - non-project related.	SRA	1,861
<b>Total Investment KFA7</b>			<b>3,791</b>

#### KFA8: Collaboration and capability development

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
2007003	Cross-sectoral investment.	C Ext	220
2011072	PhD Scholarship: enhancing sugarcane for decreased water content and increased sugar content at harvest.	C Ext	1
2013077	PhD Scholarship: investigating the utility of mill mud for soil health conditioning and nutrient use efficiency on sodic soils within the Burdekin.	C Ext	1
2013078	PhD Scholarship: effect of organic nutrients on sugarcane growth, microbial activity and greenhouse gas emissions.	C Ext	1
2013900	Contribution to CRRDC.	C Ext	30
2014102	PhD Scholarship: sugarcane for water limited environments - characterisation of a selected sugarcane germplasm for transpiration efficiency	C Ext	1

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
	and high biomass production for the sugarcane growing regions of Australia.		
2014107	SPRS: investigation of genetic control of sugar accumulation within the sugarcane culm (stalk).	C Ext	11
2014108	SPRS: soil nitrogen dynamics – a microdialysis approach to quantify nitrogen cycling in sugarcane soils.	C Ext	11
2014109	SPRS: statistical data mining algorithms for optimising analysis of spectroscopic data from on-line NIR mill systems – improving system calibrations for quality measurements and variety discrimination.	C Ext	42
2014200	Research workshops.	C SRA	20
2014201	Other capability investment.	C Ext C SRA	258
2015103	Mesostigmatid mites as predators of nematodes in sugarcane soils: occurrence, ecology, food preferences and biocontrol potential.	C Ext	30
2015105	Plant growth promoting Rhizobacteria for Australian sugarcane: bridging the gap from simple systems to engineered microbiomes.	C Ext	30
2016101	PhD Scholarship: combining controlled release and nitrification inhibitor properties to deliver improved fertiliser nitrogen use efficiency in high-risk environments.	C Ext	30
2016102	PhD Scholarship: development and modelling of novel controlled release fertilisers for improved nutrient delivery.	C Ext	30
2016307 - 2016404	Sugar Industry Travel and Learning Awards (STLA).	C Ext	35
2017013	Integrated standardised competency based training for sugar milling operations.	C Ext	404
2017794	Socio-economic research (future investment placeholder).	C Ext	150
<b>Total Investment KFA8</b>			<b>1,304</b>

KFA9: Organisational effectiveness

PROJECTS			
Project No.	Description	Project Type	2017/18 \$k
<b>1. Centrally-Managed Research</b>			
Various	R&D executive management, research stations.	SRA	3,476
Various	Research funding management.	SRA	1,399
<b>2. Corporate Support</b>			
Various	Board and investor relations, finance, operations management.	SRA	3,275
<b>Total Investment KFA9</b>			<b>8,150</b>

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## ATTACHMENT 2 – Abbreviations and acronyms

ACIAR	Australian Centre for International Agricultural Research
AISRF	Australia-India Strategic Research Fund
AOP	Annual Operational Plan
ARC	Australian Research Council
BMP	Best management practice
C Ext	External provider/RFU contracted projects
C SRA	SRA provider/RFU contracted projects
CAS	Cane analysis system
CCS	Commercial cane sugar
CRM	Contact resource management
CRP	Collaborative research project
CRRDC	Council of Rural Research and Development Corporations
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cth	Commonwealth
DNA	Deoxyribonucleic acid
EM	Extraneous matter
FAT	Final assessment trial
GPS	Global positioning system
HR	Human resources
IBP	Industry Biosecurity Plan
IP	Intellectual property
IT	Information technology
k	Thousand
KFAs	Key focus areas
KPIs	Key performance indicators
LSB-PCR	Leaf sheath biopsies-polymerase chain reaction
m	Million
M&E	Monitoring and evaluation
NIR	Near infrared
NSW	New South Wales
PBR	Plant Breeder's Rights
PCR	Polymerase chain reaction
PhD	Doctor of Philosophy
PSII	Photosystem II
QLD	Queensland
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
SNP	Single nucleotide polymorphism
SPRS	Sugar Industry Postgraduate Research Scholarships
SRA	Sugar Research Australia Limited
STLA	Sugar Industry Travel and Learning Award
TCH	Tonnes of cane per hectare
YCS	Yellow canopy syndrome

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