

SRA Strategic Plan 2017/18 – 2021/22



Australia's sugarcane industry fast facts



There are about **4,000** cane farming businesses supplying **24** mills owned by **8** milling companies



95%

Approximately 95%
of Australia's sugarcane
production is in Queensland
and the remainder in
New South Wales



30%

ALCONOMIC TO A PROPERTY OF THE SECOND

Approximately 30% of sugarcane businesses are greater than 125 hectares and account for about 70% of total production



36.5Mt

The 2016 season yielded 4.8 million tonnes of sugar from 36.5 million tonnes of cane, across 372,000 hectares



3rd

Australia's sugar industry accounts for only 2.8% of world sugar production but is the world's

3rd largest exporter of sugar



\$1.5B

Approximately **80%** of Australian sugar is exported, with a yearly export value of more than **\$1.5** billion



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1. Foreword

Sugar Research Australia Limited (SRA) is entering its fifth year of operation as the primary specialist research, development and adoption (RD&A) organisation for Australia's sugarcane industry.

The first years of SRA have been focused on establishing strong foundations in terms of strategic and operational objectives, as well as systems and processes to address the needs, priorities and expectations of our industry and government investors, as guided by our inaugural 2013/14 – 2017/18 Strategic Plan.

The findings of the 2016 Independent Performance Review of SRA¹ provided a strong endorsement of SRA's governance, strategic management and research investment frameworks established since our inception and acknowledged the value provided to our investors to-date.

With the foundations as an outcomes and investor-focused organisation now firmly in place, SRA has brought forward the development and implementation of a new Strategic Plan so as to sharpen our focus on enhancing organisational performance and to set a targeted, innovative and impact-driven research agenda that will enable SRA to continue to deliver value for our investors.

This new Strategic Plan for 2017/18 – 2021/22 shapes the future direction of SRA's investment in RD&A activities for the Australian sugarcane industry. In setting this new direction, we have listened to our investors and key stakeholders and drawn on the learnings from our recent Independent Performance Review.

Our industry and government investors have made it very clear that they are looking to SRA to deliver a research portfolio that will have demonstrable and transformational impact on the profitability and resilience of the Australian sugarcane industry. The bottom line is our grower and miller investors want more dollars in their back pocket and our government investors want 'more bang for their buck'. This Strategic Plan responds to these needs and expectations accordingly.

Our Strategic Plan also aligns with the National Sugarcane
Industry Research, Development and Extension (RD&E) Strategy,
the Commonwealth Government's Science and Research
Priorities and Rural Research, Development and Extension
Priorities, and the Queensland Government's Strategic
Objectives for investment in the sugarcane industry.

To ensure we never lose focus on our industry and government investor needs and expectations, we have introduced four overarching goals to drive our research agenda over the next five years. *These goals are listed below:*

1 Drive profitability

Through innovation-led productivity gains, step-change and value-adding

Improve sustainability

Through evidence-based research and sustainable production, biosecurity and environmental management

Z Enhance capability

Through strengthened research and industry partnerships, capability development programs and collaborative knowledge transfer and adoption mechanisms

Strengthen organisational excellence

Through enhanced RD&A investment management, best practice organisational governance and a positive performance-focused organisational culture

To support delivery of these goals we have redefined our key focus areas (KFAs) for RD&A and introduced an outcome-focused program structure to better align activities, resources and knowledge exchange within our RD&A portfolio. Our RD&A portfolio over the coming years clearly reflects what our investors have asked for and includes a diverse range of programs addressing the critical research needs for Australian sugarcane growers and millers. *This includes particular attention and investment in the following RD&A activities:*

Streamlining of SRA's core breeding operations to improve efficiency of selection and the quality of new varieties, with new molecular marker selection and targeted introgression

Enhancing soil health, nutrient management and climate variability forecasting to improve industry decision support-tools and minimise environmental impacts

Tackling 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

Quantifying and demonstrating the impact of harvesting best practices to improve production efficiencies and profitability across the sugarcane industry value chain

Continuing effort to identify causal factor(s) and management strategies for yellow canopy syndrome (YCS) to limit impacts on productivity and profitability

Identifying new milling technology and processes to enhance cane quality, plant utilisation, sucrose recovery, energy optimisation and waste minimisation

Collaborating with other researchers, government and private sector organisations on transformative and disruptive technologies to drive industry profitability and sustainability

Innovating by facilitating novel long-term blue-sky research that may transform the future

In delivering on this Strategic Plan, SRA will balance the immediate needs of growers and millers against the need for long-term innovation and strategic basic research to deliver step-change for the industry. To do this, we will integrate and leverage both conventional and disruptive technologies, providing opportunities for more effective use of resources and inputs, increased profitability, improved decision-making and enhanced sustainability.

Over the course of the next five years, we will continue to consult with and listen to our investors, understand their needs and respond to these needs through innovative R&D solutions that are successfully adopted.

In doing so, we will add value to the Australian sugarcane industry, not just in terms of profitability but also in terms of contributing to economic growth, environmental stewardship and social prosperity in regional Australian communities.

We will review our Strategic Plan annually and amend it where necessary to reflect shifting challenges and research focus.

We will also report against the delivery of the Strategic Plan and Annual Operational Plans through our Annual Report and our Annual Performance Reports. Our reporting will focus on the impacts delivered through our RD&A investments, with our key performance indicators continually being revised as more robust impact data becomes available. We are progressing well with implementing monitoring and reporting processes to track adoption and practice change across the industry, and the associated impacts on growers and millers, and will incorporate this information in our reporting to investors.

We will also continue to strengthen our organisational capability and culture to deliver better outcomes for our investors and establish impact-oriented and partnership-driven enabling strategies to support innovation and enable SRA to better respond to emerging challenges and harness opportunities wherever possible. In simple terms, SRA's role in the years ahead is to lead, partner and invest in RD&A activities that will enable our growers and millers to remain profitable and our industry resilient over the long-term. This Strategic Plan provides the platform for us to fulfil this role.

Pan Swendello

Dr Ron SwindellsChairman, June 2017

Sugar Research Australia Independent Performance Review: Final Report, October 2016, available at https://sugarresearch. com.au/sra-information/investor-information/.

2. Strategic Plan Summary

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 Improve profitability sustainability	Enhance Strengthen capability organisational excellence					
Our key focus areas	Outcomes	Priorities (incorporated into programs)					
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					
Soil health, nutrient management and environmental sustainability	Better soil health, reduced nutrient losses and improved water quality	Integrated and focused soil health program and enhanced SIX EASY STEPS guidelines and nitrogen management					
Pest, disease and weed management	Reduced or avoided yield losses and/or added input costs	New integrated precision technologies and activities on a cost/benefit basis					
4. Farming systems and harvesting	Improved farm input-output efficiencies and profitability	Economic analyses and demonstration o new or improved technology, farm management practices and analysis tools					
Milling efficiency and technology	Optimised production, improved capital utilisation and waste minimisation	Enhanced capability and new technology for improving processing and energy efficiency					
Product diversification and value addition	Diversified revenue streams and product innovation	Prioritised diversification opportunities for further R&D activity or market analysis					
7. Knowledge and technology transfer and adoption	Accelerated adoption of new technology and practice change	New strategy targeting industry needs, problems and solutions					
Collaboration and capability development	Enhanced industry and research capability and capacity	Leveraged industry, government and research partnerships and enhanced human capability programs					
9. Organisational effectiveness	Increased investor satisfaction and returns on investment	Embedded investor and performance- centric culture					
	Mapping the future Sustaining fin	ancial viability Partnering for impact					
Our enablers	Initiovating our science	g return on Transforming our culture					
Our measures of success		l industry High-impact return on nability investment					
Our values	Investor Innovation satisfaction	Accountability Teamwork					



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

Our activities are funded through statutory levy payments from sugarcane growers and millers, co-investment from both the Commonwealth and Queensland Governments and collaborative investment from other research providers and private sector partners, as well as through other commercial sources such as cane sales.

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.

Ingham
Burdekin

Mackay

The number of
different research
farms, laboratories
and offices SRA
employees work
across

Woodford
Indooroopilly

Broadwater

The number of staff
SRA employs



4.1. Operating environment

The Australian sugarcane industry operates in a dynamic world market with political, economic, social, technological, legislative and environmental factors continually evolving and impacting sugarcane production.

An assessment of these macro and micro factors and their associated current and potential influences on RD&A was undertaken in the development of this Strategic Plan, with the following key trends and drivers being identified.

World sugar market

- Australia ranks third largest exporter of sugar in the world producing only around three per cent of the world's sugar. Our strong export position is maintained by leveraging the Australian industry's competitive advantage in supplying consistent high quality sugar and close geographical proximity to Asian importers.
- Forward outlook for demand for Australian sugar exports remains positive with world consumption consistently growing at two per cent per annum, mainly driven by population growth and increasing affluence in emerging economies.
- Growing worldwide sugar and nutrition health debate and associated push for legislative intervention, such as taxes on sugarbased products, could potentially impact consumption in developed countries and increase competition from sugar substitutes.
- Sugar price volatility is expected to continue in future years.
- Lower Australian dollar makes sugar exports more cost competitive.
- Disruption in market access and Free Trade Agreements causing upheaval in global trading patterns and competiveness.

Sugarcane production

Steady increase in Australia's annual sugarcane production over recent years with a 10-year high of 36.5 million tonnes of
sugarcane crushed in 2016. However production is expected to decline in 2017 to just under 34 million tonnes due to drought
conditions in Queensland's southern region and the impact of Cyclone Debbie in the central region. RD&A to support
production growth and mitigate impact from extreme weather events is critical for securing industry profitability and resilience.

Production costs

 Escalation of energy, water and materials' costs is impacting profit margins and driving improvements in efficiency and productivity.

Productivity

• Low growth in Australian yield over the last decade coupled with incremental gains in efficiency becoming harder to achieve is driving the need for transformational change in plant breeding and farm production systems.

Government co-investment

 Changing Commonwealth and Queensland Government investment requirements are driving increasing competitiveness for research funding and greater accountability, collaboration and demonstrated value from SRA's RD&A investment portfolio.

Collaboration

 Growing pressure on available resources and investment funds is driving increased collaboration with industry, researchers, government and private sector to leverage multi-disciplinary and multi-institutional resources and capability and accelerate the rate of innovation.

Climate

 Climatic variability and extreme weather events are driving increased R&D investment to better understand, forecast and use climatic information in sugarcane production and management of off-site movement of nutrients and chemicals.

Environment

- Industry, government and community focus on reducing farming impact on water quality and nutrient run-off into the Great Barrier Reef catchment is driving growth in adoption of best practice sustainable farming systems and accountability in environmental management.
- Trend towards renewable energy, waste minimisation, carbon sequestration and environmentally friendly chemical usage is driving innovation in technology and production processes, on-farm and at-mill.
- Expansion of sugarcane production in marginal soils is driving development of soil health tools and farming practices to improve soil condition and productivity.

Social license to operate

Increasing worldwide public health consciousness and growing concern regarding nutritional impacts of sugar along with
growing public scrutiny and expectations for sustainability improvement are driving accountability for delivering positive
economic, social and environmental impacts.

New scientific practices and disruptive technology

- Disruptive 'big data', sensors and smart connected technologies are driving innovation in data analysis and decision-support tools.
- · 'Game changing' robotics, automation, drones, sensors and global positioning systems (GPS) are redefining production systems.
- Biotechnologies advancing application of genomics and gene technology are helping to improve sugarcane varieties.
- Increasing investment in strategic basic research is enhancing opportunities to solve fundamental issues and drive transformational change.
- Enhancing knowledge, skills and capacity to use advanced technology is critically important for accelerating uptake and
 optimising the potential of the technology.

Diversification

- Increasing scope for the sugarcane industry to be a major source of sustainable feedstocks for animal nutrition, bioenergy, chemicals, polymers, pharmaceuticals and other value-add products.
- Major biorefinery and cogeneration infrastructure projects are expected to be developed and operational over the next few years
 in Queensland, including Renewable Developments Australia's biorefinery and cogeneration facility near Charters Towers and MSF
 Sugar's \$500 million investment in four green energy power plants near Mareeba, South Johnstone, Mulgrave and Maryborough.
- Industry support for broad-scale diversification is not however widespread with short to medium-term economic viability being the major concern.

Extension and adoption

• Industry extension delivery is fragmented resulting in an urgent need for a cohesive industry-agreed adoption strategy and implementation mechanisms to improved transfer of technologies and practice change.

Demographics

Aging workforce, availability of industry and researcher expertise and a shift from lifestyle farming to commercial farming are
necessitating targeted succession planning and capability development.

Industry relations

Modification of industry marketing arrangements and the influence of international ownership across the industry value chain
are affecting the sugarcane industry dynamic. Whilst more investment has been injected into broad-scale application of best
practice and farming and milling production infrastructure, relations between growers and millers have been strained in some
regions due to protracted cane supply agreement negotiations.



4.2. Investor priorities

In developing this Strategic Plan, SRA undertook a comprehensive consultation program to hear directly from growers, millers, government investors, industry representative bodies and other stakeholders about regional and industry-wide opportunities and challenges, and to prioritise RD&A needs. A range of engagement activities were undertaken including regional forums, face-to-face meetings and an online survey.

Our investors and stakeholders were very clear on what they expected from us. It was clear that they see SRA as playing a pivotal role in helping sugarcane growers and millers maximise profitability through productivity efficiencies and value-add, whilst enhancing the industry's environmental sustainability practices. Furthermore, it is also clear that SRA needs to continue to improve the way we communicate with our investors and how we facilitate the adoption of new technology and practices.

The strategic agenda that underpins this Strategic Plan responds to the challenges and opportunities raised during consultation. Table 1 outlines the common RD&A themes and issues raised during the consultation process and where they are addressed in this plan. Whilst the industry challenges and RD&A needs broadly remain the same as those addressed in our inaugural Strategic Plan, there has been some shift in priority, particularly with respect to a growing focus on soil health and environmental management.

The goals, KFAs and associated RD&A deliverables in this Strategic Plan also align with the National Sugarcane Industry RD&E Strategy, the Commonwealth's National Science and Research Priorities and the Rural Research, Development and Extension Priorities, as well as the Queensland Government's objectives for investment in sugarcane research. 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.

This Strategic Plan is part of an iterative planning process. SRA will continue to consult regularly with investors and industry representative bodies to identify changing priorities and new challenges and opportunities as they arise and to ensure SRA is meeting investor needs and expectations. SRA will also report on the level of research investment against the National Science and Research Priorities and the Rural RD&E priorities in our Annual Operational Plans and Annual Reports.



Challenge or opportunity raised by industry

Productivity and profitability:

- New technology and innovation needed to increase efficiencies and reduce operating costs
- Demonstrate returns from RD&A with a shift in focus from tonnes per hectare to \$ per hectare.

SRA Response²

SRA has introduced an overarching Profitability goal that is supported by a suite of deliverables across our KFAs targeting improved input-output efficiencies, value-add and economic returns. For example:

- KFA 1 Improved plant breeding systems to increase the rate of genetic gain and delivery of new varieties. (Refer page 24)
- KFA 2 Decision-support tools for the use of enhanced efficiency fertilisers.
 (Refer page 25)
- KFA 3 Monitoring and decision-support systems that allow precision chemical application. (Refer page 26)
- KFA 4 Demonstrated economic and productivity results of investment in improved irrigation systems. (Refer page 27)
- KFA 5 Measurement and monitoring systems, including enhance Near Infrared (NIR) technology, to improve crop monitoring and in-mill cane analysis. (Refer page 28)
- KFA 6 Assessment of technologies for the conversion of sugarcane biomass into value-added fuels, chemicals and feedstocks. (Refer page 29)
- KFA 7 Regionally-targeted adoption and communication strategies and activities to accelerate adoption of new technology and innovative practices. (Refer page 30)
- KFA 8 Collaborative partnerships to leverage research investment. (Refer page 31)
- KFA 9 Innovation Catalyst program to foster scientific exploration and innovation to drive transformational change in industry. (Refer page 32)

Varieties:

- Low or declining commercial cane sugar (CCS), particularly in northern regions, needs to be addressed.
- More local-specific varieties required.

Soil health, environmental sustainability and social license to farm:

- Greater focus required on production constraints through an emphasis on soil health, nutrient management, climate variability and environmental impacts
- Research and decision-support tools needed for dealing with marginal soils.

KFA1 – SRA is overhauling its plant breeding program with new technology and systems being introduced to improve genomic selection for targeted and regionally-specific traits (including CCS) and to increase the rate of genetic gain. (Refer page 24)

The research programs under KFA1 are highlighted in SRA's RD&A Plan as critical investment areas for addressing current industry challenges and opportunities. (Refer page 23)

SRA has introduced an overarching Sustainability goal that is supported by a suite of deliverables under KFAs 2, 4, 7 and 8. For example:

- KFA 2 Enhanced nutrient management and climate variability forecasting for improved on-farm decision making and minimisation of off-farm impacts. (Refer page 25)
- KFA 2 Investigation of organic and other amendments on marginal soils.
 (Refer page 25)
- KFA 2 Regional and industry-wide measurement of relevant economic and environmental indicators to demonstrate positive impact of improved farming systems. (Refer page 25)
- KFA 4 Improved irrigation scheduling and automation tools that are more water and energy efficient. (Refer page 27)
- KFA 7 Enhanced capability and strategies to manage and utilise milling waste streams and energy by-products for improved profitability and environmental sustainability. (Refer page 30)
- KFA 8 Collaborative participation in cross-sectoral research programs covering: soils; nitrogen-use efficiency; novel fertilisers and feed; pesticide applications; climate change and managing climate variability; water use in agriculture; seasonal forecasting; irrigation; and biofuels, energy and biorefineries. (Refer page 31)

The research programs under KFA2 are highlighted in SRA's RD&A Plan as critical investment areas for addressing current industry challenges and opportunities. (Refer page 23)

 $^{^{\}rm 2}~$ Refer Attachment 2 for details on planned RD&A priorities, programs and outputs.

Challenge or opportunity raised by industry	SRA Response
Extension and adoption: Extension is not working as needed for industry Better integration required between SRA and extension providers.	KFA 7 – SRA will work collaboratively with industry and extension providers to develop regionally tailored strategies and processes to accelerate the transfer of research knowledge and technology, and accelerate adoption across industry. (Refer page 30) The 'Knowledge transfer and adoption' program under KFA7 is highlighted in SRA's RD&A Plan as a critical investment area for addressing current industry challenges and opportunities. (Refer page 23)
Demonstration of impact of harvest best practices at local level should be expanded Harvester design improvements required.	KFA 4 – SRA has established a program of activities targeted at improving harvesting efficiency, including: expansion of regional demonstrations and quantification of value loss under different harvesting procedures; promotion of harvesting best practice; and improved harvester designs and cane-cleaning systems. (Refer page 27) The 'Harvesting systems and cane cleaning' program under KFA4 is highlighted in SRA's RD&A Plan as a critical investment area for addressing current industry challenges and opportunities. (Refer page 23)
Pest and disease management: Ongoing pest and disease management strategies and tools required – Pachymetra, soldier fly, rats, pigs, ratoon stunting disease and canegrubs highlighted in some regions YCS was not raised as a significant issue but some concern YCS may be impacting CCS.	KFA 3 – SRA will enhance biosecurity prevention and pest and disease management strategies and technologies to enable sustainable and cost-effective management of biotic threats impacting sugarcane production. (Refer page 26) KFAs 1-4 – Continued investigation of the impact, causal factor(s) and management options for YCS. (Refer page 26)
Milling efficiency: Capacity and infrastructure utilisation improvement to increase milling efficiency Capability building and extension services required.	KFA 5 – SRA will undertake a suite of activities targeted at: optimising transport and quality of cane delivered to mills; improving sugar quality; improving mill processing efficiency and capacity utilisation; energy efficiency; and enhancing milling capability, knowledge transfer and adoption. (Refer page 28)
Product diversification: Value-add through use of the whole sugarcane plant Economic viability assessments required.	KFA 6 – SRA will seek to enhance industry value through the identification and market viability analysis of new opportunities for new products or uses for sugarcane. (Refer page 29)
Capability development: Succession planning needed for industry and SRA Leverage collaborative partnerships where appropriate.	SRA has introduced an overarching Capability goal that is supported by a suite of deliverables under KFA 8, including: annual researcher and industry scholarships and awards; industry workforce development strategy, systems and processes; and enhanced industry and research collaborations. (Refer page 31)
SRA communication: Diverging views on communication products and activities – either too much information, not the information needed or happy with the information. Overlap with extension issue – more face-to-face communication required.	KFA 7 – SRA will enhance and develop appropriate and tailored communication tools and mechanisms that synchronise with research and adoption activities and inform industry on research projects, research outputs and benefits from completed research. SRA will also monitor grower and miller satisfaction with our communication products and services through annual surveys so that our communication remains relevant and useful. (Refer page 30)



5. Our strategy

5.1. Strategic agenda

SRA has established a strategic agenda that responds to the challenges, opportunities and investor priorities identified during the development of this plan. Our strategy has been reframed to more clearly articulate that our primary function is to invest in impactful evidence-based RD&A to underpin the profitability and resilience of Australia's sugarcane industry.

We have 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.

Our goals

Drive profitability

Contribute to and increase profitability across the industry value chain through innovation-led productivity gains, step-change and value-adding.

- Improve input output efficiencies
- Increase net profit: per hectare, per tonne, per CCS
- Increase return on investment

Improve

sustainability

Safeguard the industry from biotic threats, climate variability, environmental constraints and social license to operate pressures through evidence-based research and sustainable production, biosecurity and environmental management tools, systems and impact assessment.

- Improve resilience
- Reduce environmental footprint
- Maintain social license to operate

Enhance capability

Build the skills, knowledge and capacity of industry participants through strengthened research and industry partnerships, capability development programs and collaborative knowledge transfer and adoption mechanisms.

- Maintain and/or build relevant expertise and capacity
- Accelerate adoption and practice
- Leverage enduring collaborations

Strengthen organisational excellence

Maintain investor satisfaction and positive returns on investment through enhanced RD&A investment management, best practice organisational governance and a positive performance-focused organisational culture.

- Maintain high investor satisfaction
- Demonstrate value and return
- Maintain high governance standards

Key focus areas	RD&A programs
Optimally-adapted varieties, plant breeding and release	 Plant genetics/selection: improve breeding systems for genetic gain and delivery of new varieties through use of new molecular marker technology and introgression pipeline. Physiology and trait development: improve understanding of plant physiology and improve varieties for specific traits. Diagnostics: improve or develop diagnostics technologies for genetic screening. Fundamental research for gene characterisation and editing.
2. Soil health, nutrient management and environmental sustainability	 Soil health: improve understanding of soil fertility, soil biology and chemical and physical attributes, including soil compaction. Nutrient management: improve management of soil resources, nutrients and chemical inputs to reduce nutrient losses and decrease environmental footprint. Climate variability and forecasting: improve capability to predict and adapt to variable climatic conditions. Environmental sustainability and social license to operate.³
3. Pest, disease and weed management	 Biosecurity: enhance capacity to manage biosecurity risks. Pest control: enhance capability to deal with pests. Disease management: improve disease management strategies and technologies. Weed management: improve weed management strategies and technologies. Yellow canopy syndrome (YCS): investigate causal factor(s) and develop management strategies.⁴
4. Farming systems and harvesting	 Precision agriculture (PA): improve understanding and uptake of PA technologies. Water management: improve irrigation and water management. Farming systems: improve planting systems; crop performance; crop rotations; and on-farm energy efficiency. Harvesting systems and cane cleaning: improve technology and identify and demonstrate harvesting best practice.
5. Milling efficiency and technology	 Cane quality and transport: optimise mill transport and improve cane quality to mills. Sugar quality: improve sugar quality. Mill operations: improve mill processing efficiency and mill capacity utilisation. Step-changing projects: development of new mill processes and technology. Energy efficiency: improve cost-efficiency in the use of energy. Knowledge transfer and adoption: improve extension, communication and information, and technology transfer and adoption.
6. Product diversification and value addition	 Enhancing value: identification and implementation of new opportunities for new products or uses for sugarcane.
7. Knowledge and technology transfer and adoption	 Knowledge transfer and adoption: establish a contemporary strategy and regionally-based partnerships to promote awareness and uptake of new research knowledge and technology. Business performance: improve farm business and risk management decision making.
8. Collaboration and capability development	 Sectoral and cross-sectoral collaboration. Scholarships: enhance research capacity through recognised training. Sugarcane Industry Travel and Learning Awards (STLA): travel and learning to enhance innovation capacity. Training to enhance qualifications and skills: workshops; Early Career Researcher (ECR)/Mid-Career Researcher (MCR) Awards; and leadership.
9. Organisational effectiveness	 Culture: embed values and culture across SRA. People: attract, retain and develop a first-class workforce. Workplace: optimise facilities, systems and processes to support leading-edge RD&A.



Our RD&A Plan

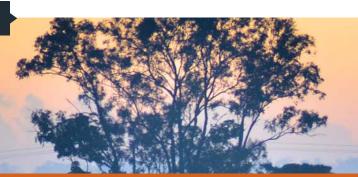
Our detailed RD&A Plan to deliver on our goals and KFAs is provided in Attachment 2. The RD&A Plan maps out for each KFA the key RD&A priorities, programs, outputs, short- and longer-term outcomes, key performance indicators (KPIs) and impacts contributing to our goals. Our Annual Operational Plans will further outline the key deliverables, project portfolio and financial forecasts for delivering on our Strategic Plan.

SRA recognises that we cannot deliver on our strategic agenda by ourselves – we require the continuing cooperation and collaboration of the sugarcane industry and our RD&A partners. Our role is to create value by bringing innovative technology and practices to the industry and facilitating the uptake of these innovations. It is up to the sugarcane growers, harvesters, millers, advisers and other stakeholders in the industry value chain to embrace and adopt research innovation so that the industry as a whole can deliver the step-change improvements necessary to secure industry profitability growth and resilience.

5.2. Enabling strategies

Delivery of our Strategic Plan will be supported through a suite of enabling strategies that will 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.
- ³ KFAs 1 to 9 also contain projects that contribute to environmental sustainability and social license to operate.
- ⁴ 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.



6. Our approach

6.1 Investment process and balanced portfolio

SRA is committed to ensuring it invests in, 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;
- 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.





6.2. Collaboration

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 natural resource management 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 research and development corporations (RDCs) and industry-owned research companies 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 Commonwealth Government's Rural R&D for Profit Programme. In addition, SRA actively participates in the Council of Rural R&D Corporations (CRRDC) projects, working groups and other activities. Details on SRA's planned cross-sectoral activities are provided in Attachment 2 under KFA8 outputs.

Strategic partnerships and joint investment in advanced technologies and agricultural practices will continue to be an important part of our investment strategy going forward. In particular, SRA will seek 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 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.

A further priority in this planning period will be collaborating 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.



7.1. Monitoring and Evaluation Framework

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 KPIs and tangible targets that will be progressed and monitored through annual operational planning and reporting mechanisms. Attachment 3 details SRA's KPIs and targets.

The core measures of success for SRA are:

- 1. Increased profitability for growers and millers
- 2. Improved industry sustainability
- 3. High-impact return on investment

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.

7.2. Independent Performance Review

As prescribed under both SRA's Constitution and the Statutory Funding Agreement (SFA) 2013-2017 with the Commonwealth Government, SRA is required to engage an independent organisation to undertake a comprehensive review of performance every four years. The Independent Performance Review focuses on reviewing SRA's performance against the provisions of the SFA and the extent to which the company is delivering benefits to its investors. The review includes consideration of SRA's role as both a research investor and research provider and an assessment of SRA's corporate governance; operations; planning, monitoring, evaluation and reporting; and interaction with investors and broader stakeholders.

SRA's inaugural Independent Performance Review was completed in late 2016 by independent reviewers Scott Williams Consulting in association with Miracle Dog and Harrison Business Strategies. The review findings detailed in the Independent Performance Review Report⁵ provided a strong endorsement of SRA's governance, strategic management, and research investment programs. The Report also provided recommendations for enhancing SRA's operational and strategic management in the areas of: culture; planning and reporting; RD&E management; adoption processes; and communication and reporting.

The SRA Board endorsed the review findings, accepted all of the recommendations and implemented a response plan to put the review recommendations into action. The Report is available on SRA's website along with the SRA Board's response to the review findings and recommendations. The next Independent Performance Review will be undertaken in 2020.

Sugar Research Australia Independent Performance Review: Final Report, October 2016, available at https://sugarresearch.com.au/sra-information/investor-information/.



8. Financial forecast

	2017/18	2018/19	2019/20	2020/21	2021/22
Operating income	\$k	\$k	\$k	\$k	\$k
Industry contribution (statutory levy)	23,800	23,800	23,800	23,800	23,800
Commonwealth Government co-investment ⁶	7,200	6,640	6,640	6,640	6,640
Queensland Government co-investment	3,309	2,850	2,850	2,850	2,850
Collaboration/Service Fee income ⁷	4,500	4,500	4,500	4,500	4,500
Interest	992	992	992	992	992
Other	1,330	1,070	1,070	1,070	1,070
Operating income total	41,132	39,853	39,853	39,853	39,853
Operating expenditure ⁸					
R&D					
External contestable	11,023	10,088	8,060	6,782	7,150
Internal contestable	9,952	9,952	9,952	9,952	9,952
Internal core ⁹	11,744	11,979	12,218	12,463	12,712
Industrial contract research	3,342	2,116	2,116	1,116	616
Research adoption 10	2,692	2,745	2,800	2,856	2,914
R&D centrally managed ¹¹	4,875	4,961	5,049	5,139	5,231
R&D total	43,628	41,842	40,197	38,309	38,575
Corporate					
Board and investor relations	1,160	1,184	1,207	1,231	1,256
Corporate support ¹²	2,115	2,157	2,200	2,244	2,289
Corporate total	3,275	3,340	3,407	3,475	3,545
Operating expenditure total	46,903	45,183	43,604	41,784	42,120
SRA operating result for the year	(5,771)	(5,330)	(3,752)	(1,931)	(2,267)

SRA's investment portfolio is primarily funded through the statutory sugarcane levy of 70c per tonne of cane, with growers and millers each contributing 35c per tonne of cane. This is supported by co-investment from the Commonwealth and Queensland Governments and strategically-leveraged collaborative investments, as well as minor income from other sources, such as interest and royalties from the use of intellectual property. To deliver on our research portfolio and optimise value for our investors, SRA is currently forecasting an operating deficit for the next five years. While SRA is currently committed to maintaining our current investment levels and research focus, as per this Strategic Plan, the forecast debt will be reviewed annually. This current forecast deficit can be covered by SRA's accumulated financial reserves.

⁶ 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.

⁷ Includes collaborative income from Rural R&D for Profit Programme.

⁸ Non-external expenditure reflects post-overhead allocations.

⁹ Internal core includes plant breeding, biosecurity, plant health.

¹⁰ Research adoption includes adoption and communications.

¹¹ Includes research funding management, research stations and resources and research KFA management.

¹² Includes Finance, IT, HR, Library and IP.

Attachment 1: Alignment of SRA's KFAs to Government priorities

				SRA	key focus	area			
Stakeholder priorities	 Optimally-adapted varieties, plant breeding and release 	2. Soil health, nutrient management & 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 – T	hemes ¹³								
Products Expanding uses for sugarcane									
Productivity Achieving significant productivity gains and increasing adoption									
3. Stewardship Improving environmental performance and industry's social license									
People Building the capability of industry and research									
National Science and Research Priorities ¹⁴									
1. Food									
2. Soil and water									
3. Transport									
4. Cybersecurity									
5. Energy									
6. Resources									
7. Advanced manufacturing									
8. Environmental change									
9. Health									

¹³ National Sugarcane Industry RD&E Strategy, 2017.

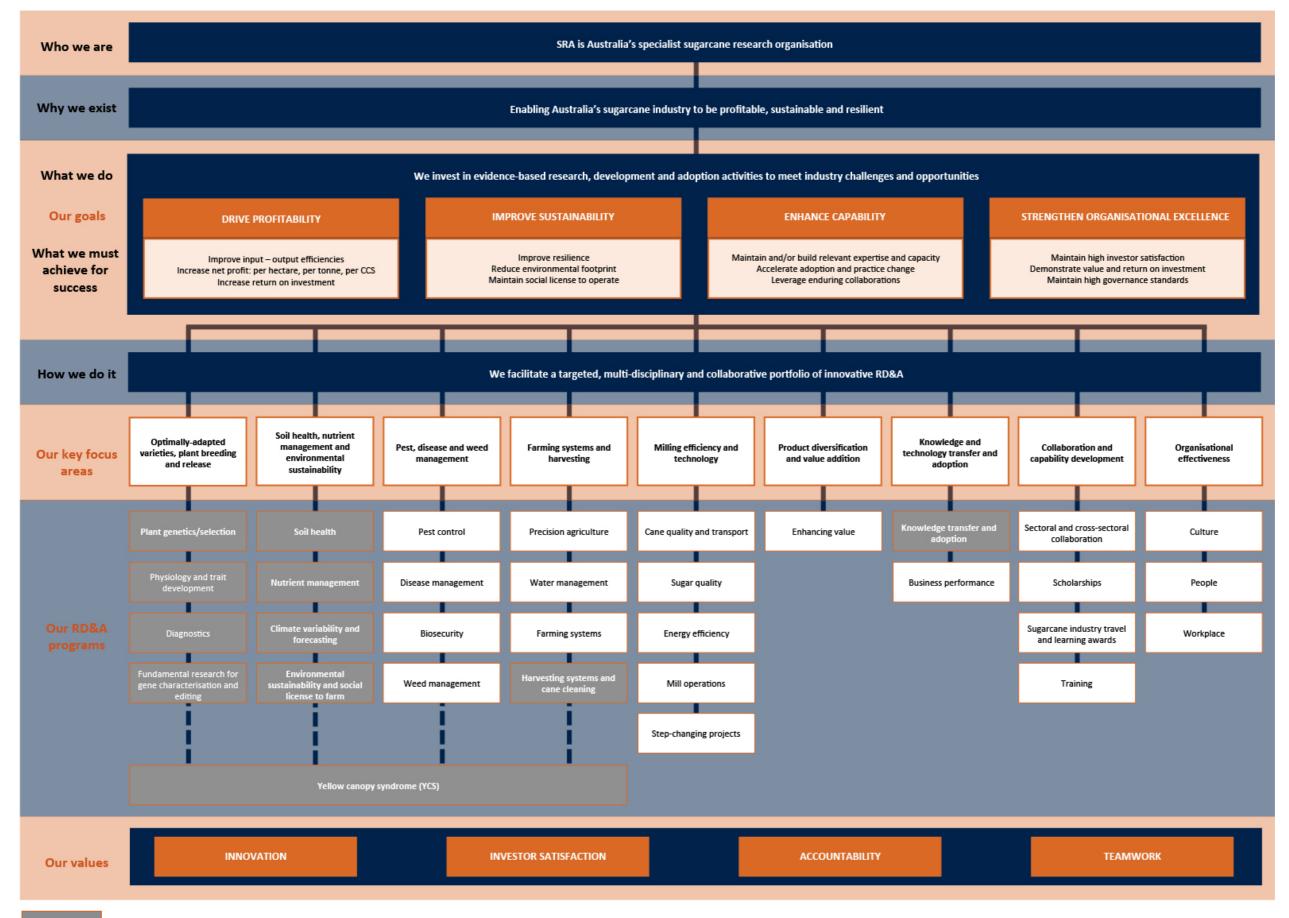
¹⁴ National Science and Research Priorities, Australian Government, 2015.

				SRA	key focus	area			
Stakeholder priorities	 Optimally-adapted varieties, plant breeding and release 	2. Soil health, nutrient management& 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
Rural RD&E Priorities ¹⁵									
1. Advanced technology									
2. Biosecurity									
Soil, water and managing natural resources									
4. Adoption of R&D									
Queensland Department of Agriculture and Fis	sheries – T	heme Area	ıs for Suga	rcane Rese	earch Inve	stment ¹⁶			
Sugarcane improvement – to improve productivity, quality and production efficiency									
2. Sugarcane plant protection									
Farming Systems broad acre dry land and irrigated, and mixed crop farming systems in Queensland									
4. Soil health									
New market opportunities and processes									
6. Agri-intelligent systems									
7. Breaking barriers to adoption									

¹⁵ Rural RD&E Priorities, Agricultural Competitiveness White Paper, Australian Government, 2015.

¹⁶ Department Strategic Objectives for funding projects for SUGARCANE, Queensland Department of Agriculture and Fisheries, 2017.

Attachment 2: RD&A Plan



KFA 1: Optimally-adapted varieties, plant breeding and release

Key RD&A Priorities

- Implement targeted breeding research and streamlining of core breeding operations to improve efficiency of selection and the quality of new varieties.
- Restructure and modernise the plant breeding program to increase the rate of genetic gain by introducing the following:
 - gene mapping, gene function determination, marker assisted selection and genomic selection
- validate molecular marker technology and implement in core breeding program in a cost-effective manner
- Develop integrated technology platforms and databases to enable the handling and manipulation of germplasm data
- Use of next-generation precision-phenotyping strategies to enable high-resolution linkage mapping, genome-wide association studies and for training genomic selection models in sugarcane improvement
- Simulation modelling in combination with environment characterisation to enhance our understanding of variety genotype and environment interactions
- Develop efficient data management system (i.e. SPIDNet) and advanced analytical methods to assess 'Big Data' sets.
- 3. Broaden the genetic base of the Australian sugarcane germplasm by:
- capturing traits reflecting grower, miller and government priorities (e.g. CCS, nitrogen use efficiency, water use efficiency, frost tolerance, ratoonability and performance on marginal soils)
- Develop core introgression breeding pipeline for targeted introgression of disease resistance, nematode resistance, abiotic stress tolerance, ratoonability and milling traits; includes development of techniques and strategies like marker or gene-assisted introgression for better and faster introgression of selected traits
- Improve the international variety exchange program by importation of the most relevant germplasm
- Keep abreast of technology development in Genetic Modification (GM) and gene editing.
- 4. Ensure efficient variety delivery and variety information to the industry by:
- Efficient tissue culture multiplication and material delivery system to the industry
- Develop and/or enhance user-friendly information systems to communicate varietal information (i.e. QCANESelect™).
- Build and maintain capacity in modern plant breeding including bio-informatics, biometrics, and other essential supporting disciplines.

RD&A Programs

- Plant genetics/ selection: improve breeding systems for genetic gain and delivery of new varieties through use of new molecular marker technology and introgression
- Physiology and trait development improve understanding of plant physiology and improve varieties for specific traits.

pipeline.

- Diagnostics:
 improve or
 develop
 diagnostics
 technologies for
 genetic screening.
- Fundamental research for gene characterisation and editing.

Key Outputs

- 1. A modernised sugarcane breeding program with specific genetic gain.
- Well-characterised, genetically diverse germplasm collection available to the breeders.
- Trait-associated molecular or cytogenetic markers, developed for use by researchers and core breeding program.
- Proof of concept on a suite of new genes relevant to the Australian sugarcane industry.
- 5. Introduction of genomic selection tools to accelerate improvements in key traits.
- High-throughput genotype and phenotype screening methods developed for traits of interest to the industry.
- Accurate data in QCANESelect™ that enables growers to make better decisions regarding variety choice.
- Modern, efficient data storage and management systems available for sugarcane researchers and breeders (new SPIDNet and GBrowse).
- Catalogue of genes to be targeted through modern technologies such as GM and gene editing.

Key Outcomes

- Highly streamlined and efficient core breeding program delivering commercially desirable, high-performing varieties.
- Improvement in the genetic gain in Final Assessment Trials (FAT) clones from the current level towards the target of 2% gain per annum.
- 3. Introduction of the first phase of molecular markers in early stage selection trails.
- Proof of concept to use high throughput phenotyping to enhance selection and develop molecular markers.

Use of newly generated germplasm, through the introgression program, in the crossing program

- Molecular markers used extensively in the early stages of selection to increase the efficiency of the breeding program.
- 3. First clones in advance selection carrying genes integrated from wild germplasm.
- Variety development streamlined and directly correlated to regional growing conditions.

KPIs

- 1. A 2% genetic gain per annum, as measured by FAT test clone performance.
- 2. A 12% increase in varietal performance over 10 years.
- 3. SRA's breeding program utilises molecular markers in selection by 2022.

Key Impacts

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

Increased profitability through more productive

tainabil

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.

papiiity

plant breeding program, with cutting-edge technology, and improved programs for delivery and grower-selection of varieties.

Increased capability through a highly efficient

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

KFA 2: Soil health, nutrient management and environmental sustainability

Key RD&A Priorities

- 1. Improve understanding of soil health, biology and physical attributes to improve management practices:
- Continue identification and monitoring of key indicators of soil health and crop condition
- Research biological soil health and develop practical metrics for root health and root function that relate to rhizosphere function and microbial ecology
- Understand carbon sequestration in sugarcane farming systems and identify mechanisms to improve soil carbon stocks at depth that are responsive to management strategies in different agro ecological zones
- Investigate organic and other amendments on marginal soils
- Understand long-term impact of soil compaction as a driver of soil health.
- Enhance nutrient management and climate variability forecasting for improved strategic and tactical on-farm decision making and minimisation of off-farm impacts:
- Identify strategies to improve synchrony of nitrogen supply to crop demand through better accounting for all sources of nitrogen, precision application of inputs and the appropriate use of enhanced fertiliser products and mixes for different spatial and temporal conditions
- Enhance nitrogen fertiliser recommendations to smaller scales (zones, blocks, soil type, management practices, varieties and sub-regions)
- Improve understanding of enhanced efficiency fertilisers and their role in improving nitrogen use efficiency
- Investigate mixed species fallow cropping, intercropping, ameliorants, mill by-products and other organic inputs to alleviate soil pathogen levels, capture nitrogen, improve soil condition and reduce weed pressures
- Develop spatial layers for yield variation and soil constraints to identify production zones, guide precision application of inputs and ameliorants and to provide a baseline for measuring and monitoring improvement
- Refine and further operationalise SIX EASY STEPS as a precision agriculture tool that takes into account spatial variability, management factors, environmental impacts (particularly water quality) and the temporal needs of the crop including seasonal climate variability
- Advance the use of climate information and forecasting with bio-physical models and on-farm decision support tools.
- 3. Enhance environmental sustainability practices and maintain social license to farm:
 - Facilitate implementation of performance measurement and benchmarking of relevant economic and environmental indicators to demonstrate impact from transitioning to improved farming systems
 - Participate in cross-sectoral activities for nitrogen and water use efficiency, managing climate variability, climate forecasting, emissions reductions and energy efficiency.

RD&A Programs

- Soil health:
 improve
 understanding of
 soil fertility, soil
 biology and
 chemical and
 physical attributes
- 2. Nutrient
 management:
 improve
 management of
 soil resources,
 nutrients and
 chemical inputs to
 reduce nutrient
 losses and
 decrease
 environmental
 footprint
- Climate variability and forecasting: improve capability to predict and adapt to variable climatic conditions
- Environmental sustainability and social license to farm¹

Key Outputs

- Various soil health tools, including soil health resource hub, tool boxes, rapid diagnostic tools and test kits, and associated regional extension capability.
- Strategies to raise soil carbon stocks and improve soil nitrogen mineralisation capacity.
- 3. Decision-support tools for the use of enhanced efficiency fertilisers and other fertiliser products.
- 4. Guidelines for the use of cover crops during fallows and companion planting in rations.
- 5. Evaluation of farming practices to improve soil condition.
- 6. Validated and refined nutrient management recommendations across regions.
- 7. Refined SIX EASY STEPS guidelines.
- 8. Updated nutrient management training packages.
- Grower maps indicating temporal and spatial trends in soil constraints, yield variability, climate variability, crop nutrient use efficiency and nitrogen surplus.
- 10.Regional and industry-wide measurement and benchmarking of key economic and environmental indicators.
- 11. Collaboration with Government and NRM organisations on reef programs.

Key Outcomes

- Chronic problems and drivers of poor soil health alleviated through development and promotion of improved soil management practices
- Industry equipped with practical and costeffective solutions to meet practice standards and regulatory targets for nutrient management, irrigation practices and water quality that deliver off-farm improvements in water quality.
- Integration of climate seasonal forecasting information into strategic and tactical onfarm decision making.
- Understanding of long-term impact of modern or improved farming system on soil health, root functionality and the potential for soil carbon sequestration at depth, via 10-20 year demonstration project on trial sites.
- Industry-driven and managed environmental monitoring for water use, water quality, energy efficiency, greenhouse gas emissions and nutrient management.
- Enhanced real-time in-field decision-making through the use of advanced diagnostic tests and technologies.

KPIs

- 1. Release of updated nitrogen management recommendations by 2019.
- 2. Release of recommendations for the use of enhanced efficiency fertilisers by 2021.
- 3. 90% of growers using SIX EASY STEPS by 2022.

Key Impacts

itability

optimised use of inputs (particularly nutrients, water and energy) and enhanced soil health and biology that supports sustainable sugarcane production.

Safeguarded and improved profitability through

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through sustainable sugarcane production and minimised off-farm impacts.

Maintained industry social license to operate

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 organisations.

nisational Excell

Enhanced organisational excellence through established regional networks and communication processes to identify, respond and focus on regional issues, along with established collaborative partnerships with other stakeholders to align programs in soil health and management

¹ KFAs 1 to 9 also contain projects that contribute to environmental sustainability and social license to operate.

KFA 3: Pest, disease and weed management

Enhance biosecurity prevention and preparedness
processes:

Key RD&A Priorities

- Develop and/or maintain cost-effective and reliable high-throughput pest and disease screening techniques that enable stakeholders to make informed in-field management decisions
- Modernise diagnostic tests and protocols to allow accurate and timely identification of exotic and endemic threats to industry productivity
- Review and/or develop incursion management plans for high-risk biosecurity threats
- Maintain an effective sugarcane biosecurity capability.
- 2. Improve pest, disease and weed management tools, processes and capability:
- Develop and/or revise a suite of integrated management tools to enable sustainable and costeffective management of biotic threats (such as, soldier flies, canegrubs, rodents, pigs, Pachymetra and nematodes) impacting on sugarcane production
- Develop and promote monitoring and decision-support systems that allow precision application of pest, disease and weed control solutions
- Develop resources to support the adoption of pest, weed and disease management research outcomes.
- 3. Reduce the impact chemicals on the environment:
- Improve understanding and management of the off-site impact of chemical inputs.
- Research alternative control methods for canegrubs to reduce reliance on imidacloprid
- Develop application methods and formulations of agrichemicals to minimise off-site impacts
- Establish strong commercial partnerships with agricultural chemical registrants to facilitate and support new product and chemical development.
- Continue investigation of the impact, cause(s), and management options for yellow canopy syndrome (YCS).

RD&A Programs

- Biosecurity:
 enhance capacity
 to manage
 biosecurity risks
- 2. Pest control: enhance capability to deal with pests
- 3. Disease management: improve disease management strategies and technologies
- 4. Weed management: improve weed management strategies and technologies
- Yellow canopy syndrome (YCS): investigate causal factor(s) and develop management strategies¹

Key Outputs

- Improved screening methodologies to reliably and cost-effectively assess varietal tolerance to a suite of biotic threats early in the breeding program.
- Incursion management plans, diagnostic protocols and training packages for exotic pests and pathogens, as defined in the Sugarcane Biosecurity Plan.
- Integrated precision management strategies and training packages to provide cost effective and sustainable management of biotic threats impacting productivity and profitability.
- Disease ratings of clones to enable the objective assessment of varieties for release and propagation across varying production systems.
- Improved molecular diagnostics for exotic moth borers and major soil-borne pathogens.
- 6. Molecular diagnostic service for chlorotic streak disease.
- 7. Remote- and proximal-sensing systems for canegrubs and weeds.
- 8. New insecticide(s) for canegrub management.
- Recommendations for use of imidacloprid and herbicides that reduce environmental risk
- 10.New herbicide formulations and adjuvant combinations to reduce run-off impacts.
- 11.Identification of causal factor(s) and management methods for YCS.

Key Outcomes

 Enhanced preparedness for and management of high risk biosecurity threats to the Australian sugarcane industry.

- Enhanced capability to diagnose biotic threats (pests, weeds, diseases and rodents) to productivity and recommend management strategies to reduce their impact in a sustainable manner.
- Reduced industry reliance on chemical interventions that have detrimental environmental impacts.

 Efficient and sustainable pest management through development and application of biological control products.

Precision pest, disease and weed control through development and adoption of autonomous and remote sensing technologies.

KPIs

- Up-to-date dossiers reflecting current knowledge maintained for high-risk exotic threats, reviewed annually.
- At least 20% of growers adopted new or improved pest management strategies within last five years.
- At least 2,000 clones from various stages of selection programs, parents and foreign clones screened annually.

Key Impacts

Safeguarded and increased profitability through

added input costs) due to prevented, eliminated

reduced or avoided losses (yield losses and/or

or reduced weeds, pests and biosecurity

lidedie

protection, reduced reliance on chemical interventions, and pest, disease and weed management strategies with potentially reduced environmental impacts.

Enhanced sustainability through biosecurity

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appropriate management resources and expertise in biosecurity, pathology, entomology, diagnostics and weed agronomy.

Increased capability through access to

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.

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

KFA 4: Farming systems and harvesting

Key RD&A Priorities

- Encourage adoption of proven precision agriculture technologies, including controlled traffic and use of EM maps.
- 2. Review and improve uptake of precision agriculture technologies to improve productivity and yield.
- 3. Improve water management:
- Develop and promote tools to improve irrigation scheduling, automation and systems that are more water- and energy-efficient
- Research nitrogen and rain/irrigation water interactions to identify optimal combinations to support plant growth and resource efficiency.
- Enhance farming systems and decision-support tools to maximise productivity:
- Explore genotype by on-farm management interactions to maximise variety performance
- Optimise beneficial break crops within sugarcane farming systems
- Research farming systems and practices that are productive and profitable under different environments, including conditions of water stress (too much or too little) and in marginal soils
- Research remote- and proximal-sensing systems for estimating crop yield
- Undertake analysis and comparison of spatial layers of historical yield, influence of climate impacts and soil groupings in all production zones to identify exploitable yield gap and production constraints
- Improve GIS skills within industry, particularly the extension and advisory sector
- Promote current and develop new farming-system data collection, analysis and decision-support technology and
- Develop and/or promote farming and harvesting practices that maximise rationability
- · Improve production through on-farm energy innovation.
- 5. Improve harvesting and cane cleaning efficiency:
- Measure and demonstrate to all industry sectors the value lost by current harvesting procedures, including:
- effect of chopper blade configurations on juice losses and billet quality
- juice losses with aftermarket chopper drums
- Develop and promote harvesting best practice procedures to encourage adoption and maximise returns across the value chain, including:
 - optimal settings for chopper systems to reduce sugar losses
- post-harvest cane cleaning
- Evaluate sensors and decision-support tools that can increase harvesting efficiency; and
- Improve harvester design to reduce crop damage and cane loss.

RD&A Programs

- Precision
 Agriculture (PA):
 improve
 understanding and
 uptake of PA
 technologies
- 2. Water management: improve irrigation and water management
- Farming systems: improve planting systems; crop performance; crop rotations; and onfarm energy efficiency
- 4. Harvesting systems and cane cleaning: improve technology and identify and demonstrate harvesting best practice

Key Outputs

- Economic analyses of the consequences of adopting precision agriculture technologies and improved farming system practices.
- Automated irrigation systems for demonstration to growers.
- Irrigation scheduling tool that makes use of relevant information sources, e.g. crop growth, soil moisture and climate forecasts.
- Economic analyses and case studies of irrigation systems that use alternative energy sources
- Knowledge of variety traits and performance under differing farming systems and environments promoted through QCaneSelect™.
- Management practices to enhance crop rationability.
- 7. Economic analyses of different crop rotation scenarios.
- Commercial system for crop yield estimation for millers and growers using remote sensing.
- Crop production management zones mapped and supported with economically viable amelioration strategies to improve crop yield notential
- 10.Interoperable data management systems that facilitate digital best practice.
- 11.Quantification and case studies of cane loss under different harvesting circumstances.
- 12. Economic analysis of the value of postharvest cane cleaning.
- 13.Improved and validated Sugarcane
 Harvesting and Logistics Optimisation Tool
 (SCHLOT).
- 14.New harvester sensors or recommendations for further research.
- 15.Improved harvester designs and canecleaning systems.

Key Outcomes

- Enhanced skill capability and improved adoption of validated and improved precision agriculture technologies, water management and sugarcane farming systems.
- Greater returns across the value chain due to improved cane harvesting operational procedures and equipment.

Improved crop performance through better understanding of varieties and management practice interactions.

- Complete redesign of Australian sugarcane harvesting technology.
- 3. Evolution of farming technology through integrated IT-based platforms, automation and robotics.

KPIs

- Positive input-output efficiency ratios resulting from adoption of new technology and practices.
- 2. A 10% increase in harvesting best practice demonstration sites per region per annum.

Key Impacts

Increased profitability through optimised

sugarcane farming and harvesting practices and industry value chain efficiencies.

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

Optimised sustainable sugarcane production

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

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.

KFA 5: Milling efficiency and technology

Key RD&A Priorities

- 1. Improve production efficiency and profitability:
- Develop efficient data systems, including enhanced Near Infrared (NIR) technology, to provide real-time feedback to improve the quality and timeliness of crop monitoring and in-mill cane analysis
- · Identify product and process improvement opportunities to maintain or improve the quality of Australian raw sugar for export
- Identify new and innovative production technologies and processes
- · Identify barriers to mill feed supply and milling efficiency (e.g. extraneous matter (EM), energy costs, downtime, capital utilisation, staffing, maintenance) and develop engineering and process solutions to mitigate these losses and improve sugar recovery
- Develop collaborative forums for mill engineers to build capability and improve productivity through peerlearning and knowledge exchange.
- 2. Improve environmental sustainability and energy efficiency:
- Gain a comprehensive understanding of the environmental impact of milling waste streams and develop mitigating management strategies to reduce the industry footprint and maintain our social license to
- Improve ability to maintain cost-efficient operations under changing energy environments.
- 3. Enhance knowledge transfer and capability:
- Develop a strategy and suite of tools and activities that facilitate training for new and existing industry participants as well as milling technology researchers
- · Enhance milling knowledge transfer and extension services

RD&A Programs

- 1. Cane quality and transport: optimise mill transport and improve cane quality to mills
- 2. Sugar quality: improve sugar quality
- 3. Mill operations: improve mill processing efficiency and mill capacity utilisation
- 4. Step-changing projects: development of new mill processes and technology
- 5. Energy efficiency: improve costefficiency in the use of energy
- 6. Knowledge transfer and adoption: improve extension, communication and information and technology transfer and adoption

Key Outputs

- 1. Productivity data collection linked to field management systems.
- 2. Integrated strategies to measure, monitor, manage and improve the feedstock entering the factory and its impact on milling performance (e.g. transport logistics, EM, new varieties, season length).
- 3. Processes and management strategies to improve intermediate and final product quality.
- 4. Improved knowledge and development of tools and systems to manage identified inefficiencies in existing infrastructure and equipment.
- 5. Procedures and products for improved equipment maintenance to reduce downtime.
- 6. An intelligent and/or adaptive capital replacement strategy to guide the implementation of new technology and infrastructure.
- 7. Peer-learning and knowledge exchange fora.
- 8. Enhanced industry capability to manage and utilise mill by-products for improved profitability and environmental sustainability.
- 9. Improved strategies for attaining energy efficiency and management of impacts on mill performance (e.g. cogeneration, biodiesel).
- 10. Universal training and development packages for new and existing milling technologists.
- 11. Scoping study on milling research and capability extension services to communicate and transfer research outputs.

Key Outcomes

1. Optimised milling production for cane quality, plant utilisation, sucrose recovery, energy optimisation and waste minimisation is supported through the identification and/or development of new or improved processes and/or technology.

- 1. Modernised, highly-efficient sugarcane processing facilities.
- 2. Unlocking additional value from the whole sugarcane plant.
- 3. Preservation of cane billet and juices postharvest to prolong storage whilst maintaining the integrity of the cane.

KPIs

- 1. A 10% increase in SRA Performance Rating over five years.
- 2. Average miller satisfaction for SRA information products and services rating of at least 4 out of 5 achieved by 2022.

Key Impacts

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

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

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

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

KFA 6: Product diversification and value addition **RD&A Programs Key RD&A Priorities Key Outputs Key Outcomes Key Impacts** 1. Develop an industry-agreed prioritised list of diversification 1. Enhancing value: 1. Prioritised industry direction for future 1. Diversification and value-addition across the Sustained industry profitability secured through identification of diversification. opportunities that require further R&D activity to progress industry value chain is supported through the diversified sugarcane and sugarcane by-product revenue streams and maximised value addition to an evaluation stage. new opportunities timely identification, prioritisation, 2. New knowledge on industry diversification assessment and communication of through product innovation. for new products 2. Economic and market analysis of prioritised diversification technologies including biomass utilisation, or uses for commercial opportunities. and value-add opportunities that are considered to be conversion technologies and markets. sugarcane implementable in the Australian sugarcane industry. 3. Identified fuel, chemical and feed product 3. Complete the technical assessment of producing paper diversification opportunities. pulp from bagasse. 4. Improved innovation adoption strategies for 4. Complete assessment of platform technologies for the sugar factory diversification. conversion of sugarcane biomass into value-added fuels, chemicals and feedstocks. Enhanced sustainability of industry through 5. Develop a program approach towards unlocking value from diversified product stream, including alternative the whole sugarcane plant. uses for sugarcane waste. 1. Research project investment designed to take specific diversification opportunities from laboratory scale to pilot scale and/or demonstration scale. 2. Significant leverage from strategic collaborations with other industries to identify and commercialise specific Enhanced capability through access to expanded opportunities. product and value add opportunities, as well as 3. Futurist view of value creation through advanced technologies and modern processing sugarcane-fed biorefineries. and engineering methods. **KPIs** Enhanced organisational excellence through 1. Completion of technical review of established effective processes to monitor and diversification opportunities by 2019. assess sugarcane industry diversification opportunities. 2. Identification of new opportunities for product diversification by 2020. 3. Platform technologies for fuels, chemical and feed evaluated by 2021.

KFA 7: Knowledge and technology transfer and adoption

Key RD&A Priorities

- Develop and implement collaborative knowledge transfer and adoption strategies, processes and activities:
- Collaborate with industry and advisory sector to develop industry-agreed and regionally-targeted approaches to transfer and drive the adoption of research outputs
- Develop annual campaigns (KFA/program specific), with input from key internal and external stakeholders, in order to effectively communicate, educate and extend to achieve technology adoption and/or practice associated with research outcomes
- Develop regional adoption strategies and plans to respond to regional priorities, in collaboration with researchers, growers, millers, SRA Delegates, advisory sector and other key stakeholders, such as NRM-based organisations and government agencies
- Enhance the role of SRA Delegates to facilitate improved identification, communication and response to regional priorities and RD&A needs
- Develop mechanisms for identifying and progressing knowledge transfer and adoption pathways at project and program levels and at all stages of research and development (i.e. from preliminary research proposal stage through to final report stage)
- Establish collaborative on-farm and at-mill trials and peer-to-peer demonstrations of commercial application of research outputs and economic benefits at a regional level
- Develop holistic program-based communication strategies that synchronise with research and adoption activities to deliver positive outcomes and practice change:
- Enhance and develop communication tools and mechanisms to inform industry on research projects, progress made on research, research outputs and economic, environmental and social benefits from completed research
- Develop and package demand-driven and tailored communication material that reflects needs and demographics of the users.
- 3. Enhance knowledge of industry adoption and practice change:
- Increase knowledge of grower and miller demographics and behaviours through increased measurement and reporting of adoption and practice change
- Enhance SRA's impact assessment and evaluation to clearly demonstrate positive returns to investors, including:
- develop and maintain an adoption and practice change measurement framework to assess and monitor the impact of SRA's adoption activities and research outcomes
- develop an Evaluation Plan for commissioning impact assessments and cost benefit analyses on a selection of projects and programs
- Enhance annual Grower Survey and establish a Miller Survey to provide more granular information regarding adoption of new technologies and practice change.

RD&A Programs

- 1. Knowledge transfer and adoption: establish a contemporary strategy and regionally-based partnerships to promote awareness and uptake of new research knowledge and technology
- 2. Business performance: improve farm business and risk management decision making

Key Outputs

- Industry-supported and regionally-tailored strategies for collaborative facilitation of technology transfer and practice change.
- Regionally-tailored training activities that upskill 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.
- Suite of technical resources that assist the extension and advisory sector to work with growers and millers to enhance productivity and profitability.
- Release of innovative communication tools, including: smart phone applications, online tools, periodical newsletters, integration of communication technology into existing farming landscape of machinery, technology and information access.
- 5. Enhanced eLibrary with improved accessibility to research reports and papers.
- Publication and promotion of annual Grower and Miller Surveys.
- Publication and promotion of evidencebased case studies, impact assessments, evaluations and performance reports.
- Adoption activity and practice change measurement and monitoring incorporated into Customer Relationship Management (CRM) database.

Key Outcomes

- Collaborative, coordinated and evidencebased knowledge and technology transfer that drives broader and accelerated adoption across the industry.
- Effective, long-term working relationships and collaborations with local extension providers to optimise synergies, integrate knowledge and convert research into desired impacts.

Improved understanding of regional barriers to adoption through economic and demographic studies to better target adoption programs and strategies.

KPIs

- 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.
- 3. Average grower and miller satisfaction with SRA adoption and communication activities rating of 4 out of 5 achieved by 2022.

Key Impacts

Increased profitability through efficiencies and production optimisation along the value chain resulting from uptake of new knowledge, technology and/or practice change.

tainability

Enhanced sustainability through increased uptake of sustainable technology and practices that improve soil health, water quality, energy efficiency and waste minimisation.

relationships between researchers, industry and advisory sector effecting appropriate and timely knowledge transfer of latest research and development outcomes.

Increased industry capability through enhanced

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Enhanced organisational excellence through effective communication processes and leveraged partnerships with industry advisors, government agencies and NRM organisations fostering effective knowledge transfer and adoption pathways.

KFA 8: Collaboration and capability development

Key RD&A Priorities

- 1. Enhance industry and research collaboration:
- Build and enhance relationships, collaborations and networks within the research sector, industry and across other industries, both nationally and internationally, to leverage knowledge, resources and
- Support and participate in cross-sectoral research and development activities, such as collaborations and knowledge exchange with other Research and Development Corporations and participation in the Commonwealth Government's Rural R&D for Profit
- Support the promotion and delivery of the new National Sugarcane RD&E Strategy
- Develop and facilitate, in collaboration with industry representative bodies, an industry Futures Forum to consider the industry's long-term vision, challenges and opportunities to enhance performance, collaboration and capability.
- 2. Enhance industry and research capability:
- Maintain and promote a structured postgraduate research scholarship and support program to develop and enhance long-term industry research capacity
- Promote and facilitate the development and retention of current industry participants, as well as attract new participants to the sugarcane industry
- Support professional development and learning of researchers and industry participants through travel and learning awards
- Support the development of young and emerging researchers, growers and milling staff through facilitation of networks and regular forums
- Promote recognition of researchers through presentation of research findings at national and international forums and publication in high quality scientific journals.

RD&A Programs

- 1. Sectoral and crosssectoral collaboration
- 2. Scholarships: enhance research capacity through recognised training
- 3. Sugarcane **Industry Travel** and Learning Awards (STLA): travel and learning to enhance innovation capacity
- 4. Training to enhance qualifications and skills. workshops; Early Career Researcher (ECR)/Mid-Career Researcher (MCR) Awards; and leadership

Key Outputs

- 1. Cross-sectoral and collaborative participation
 - Soils;
 - · Nitrogen use efficiency:
 - · Novel fertilisers and feed;
 - · Pesticide applications;
 - · Climate change and managing climate variability:
 - · Plant biosecurity;
 - · AgVet chemicals;
 - · Precision agriculture;
 - · Water use in agriculture;
 - · Seasonal forecasting;
 - Irrigation;
 - Mechanical harvesting;
 - · Biofuels, energy and biorefineries;
 - · Adoption and extension services;
 - · Impact assessment;
 - · Primary industries health and safety; and
 - Australian Rural Leadership Program.
- 2. Participation in Council of Rural Research and Development Corporations (CRRDC) working groups and activities.
- 3. Memorandums of Understanding with other research organisations to exchange knowledge and research material.
- 4. Industry vision-setting and Futures Forum initiatives.
- 5. Industry workforce development strategy, systems and processes.
- 6. Annual scholarships and awards.
- 7. Young Industry Participants' Development Program and annual Forum.

Key Outcomes

- 1. Leveraged collaborations with research and industry providers to achieve synergies and extend our capacity to deliver value to our investors.
- 2. Interactive collaborations with other Research and Development Corporations and Industry-Owned Companies to improve corporate performance and achieve mutual henefits
- 3. A highly-skilled industry and research workforce with the knowledge and capability to meet current and future needs of the industry.
- 1. Increased cross-industry collaboration and investment to secure key R&D providers and projects of mutual benefit.
- 2. Increased industry leadership capability across multiple industry organisations.

KPIs

- SRA participation and investment in relevant collaborative and cross-sectoral programs and the Commonwealth's Rural R&D for Profit Program.
- 2. Maintain a minimum of four postgraduate scholarships and two early-career research awards each year
- 3. At least two short-term placements per annum of students and/or professionals in research or industry positions for industry exposure.

Key Impacts

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

Derived environmental and social benefits through leveraged investment in cutting-edge cross-sectoral and collaborative RD&A.

through leveraged expertise and resources and appropriate and timely learning and development programs.

Increased researcher and industry capability

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

KFA 9: Organisational effectiveness

Key Organisational Priorities

- Continue to build an investor-centric and performancedriven culture:
- Maintain close relationships with industry investors, SRA Delegates, government investors and industry representative bodies to ensure investor RD&A priorities are identified and appropriately addressed, with positive impacts that meet investor expectations
- Maintain culture-based leadership development and workplace activities
- Create and sustain a strong safety culture by providing a safe workplace through contemporary management systems and practices
- Encourage a sharing and collaborative approach to work through initiatives to improve organisational communication and connectivity (internal and external), reduce administrative burden on researchers and support interdependencies across SRA programs
- Foster creativity and innovation by providing employees with dedicated time and seed-funding to experiment with new scientific techniques, explore ideas or problem-solve, without fear of failure, with a view to discovering novel solutions or leads for further research activity
- 2. Empower SRA's employees and equip them for success:
- Implement a talent management and succession framework that identifies future research and capability needs and establishes mechanisms to develop and/or attract high-calibre researchers and support officers with appropriate experience and skill sets
- Enhance the capability of SRA's employees through appropriate performance management, reward and recognition, and professional development mechanisms, including mentoring, team-based problem solving and research publication in peer-reviewed journals
- Provide appropriate resourcing to ensure SRA
 researchers can remain leading-edge through managing
 workload commitments, having the right composition of
 teams and organisational structure to manage
 resources, optimal use of technology and staying
 abreast of technological advancements.
- 3. Optimise organisational facilities, systems and processes:
- Embed outcome-focused program management across RD&A investment portfolio
- Reduce financial risks through improved decision support mechanisms and timings and migration to leading-edge financial management support tools and processes
- Support research operations through enhanced connectivity, risk management, governance and Intellectual Property (IP) management
- Ensure SRA infrastructure and research facilities are modern and well-managed to meet research needs.

Programs

- Culture:
 embed values and
 culture across SRA
- People:
 attract, retain and
 develop a first class workforce
- 3. Workplace: optimise facilities, systems and processes to support leadingedge RD&A

Key Outputs

- Investor engagement and communication, including: regular scheduled updates and meetings with industry levy payers, industry representative bodies, government investors and SRA Delegates; attendance at industry Board meetings; written updates on SRA Board meeting outcomes; newsletters and publications; and consultation on SRA's strategic and operational planning.
- Continued implementation of Cultural Transformation Program, including: annual workshops; bi-annual culture and values assessment; and ongoing leadership development
- 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.
- Revised administrative systems to remove unnecessary duplication and streamline processes.
- 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.
- 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.
- Contemporary and compliant finance, governance and operational strategies, management plans, systems and processes.
- RD&A investment framework, including: project calls and assessment; direct commissioning of projects; portfolio management; systematic portfolio analysis; project and program cost-benefit analyses; and portfolio reporting.
- IP management system for identification and ongoing management of current and future IP generated through SRA's R&D portfolio.
- 10.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; videoconferencing; and web-enabled facilities.
- 11.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.

Key Outcomes

- The right internal culture, capability, systems and facilities to deliver beneficial RD&A activities to industry and positive returns on investment.
- 2. Employees are supported, valued and recognised for performance
- SRA's workplace facilities are modern and well-maintained and workplace processes are best-practice.

In-house capability in ex-post and ex-ante economic analysis and impact assessment.

Complete refurbishment of all SRA research stations.

KPIs

- 1. SRA investor Performance Rating increase from 74% 'high' (2016) to 85% by 2022.
- 2. Aggregated research investment benefit-cost ratio of 4:1 or above by 2022.
- Maintain 100% compliance with statutory and contractual requirements.

Key Impacts

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

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

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.

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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.

Attachment 3: Measures of success

Core measures of success for SRA

SRA's core measures are used 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.

Core measure	Key performance indicators
1. Increase profitability	Net profit per tonne of sugar produced.
2. Improved industry sustainability	Economic: • Yield (tonnes, CCS). • Profit (per hectare, per tonne and per CCS). Environmental: • Nutrient use and water quality benchmarks. • Adoption of Best Management Practices. Social: • Workforce capability.
High-impact return on investment	Economic, environmental and social impact assessments, including cost-benefit analyses.

KFA measures

Key focus areas	Key performance indicators	Targets
Optimally-adapted varieties, plant breeding and release	Rate of genetic gain.	2% genetic gain per annum, as measured by Final Assessment Trial test clone performance.
breeding and release	Varietal performance.	12% increase in varietal performance over 10 years.
	Use of molecular markers.	SRA's breeding program utilises molecular markers in selection by 2022.
2. Soil health, nutrient	Updated nitrogen management recommendations.	Released by 2019.
management and environmental sustainability	Recommendations for the use of enhanced efficiency fertilisers.	Released by 2021.
	Grower adoption of SIX EASY STEPS.	90% of growers using SIX EASY STEPS by 2022.
3. Pest, disease and weed management	Up-to-date dossiers reflecting current knowledge for high-risk exotic threats.	Reviewed annually.
	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.
	Pest and disease screening of clones from various stages of selection programs, parents and foreign clones.	At least 2,000 clones screened annually.

Key focus areas	Key performance indicators	Targets
4. Farming systems and harvesting	Productivity impact from adoption of new farming practices and/or technology.	Positive input-output efficiency ratios.
	Adoption of harvesting best practices.	10% increase in harvesting best practice demonstration sites per region per annum.
5. Milling efficiency and	Miller performance rating for SRA.	10% increase over five years.
technology	Miller satisfaction with SRA.	Average rating of at least 4 out of 5 achieved by 2022.
6. Product diversification	Technical review of diversification opportunities.	Completed by 2019.
and value addition	Identification of new opportunities for product diversification.	Completed by 2020.
	Evaluation of platform technologies for fuels, chemical and feed evaluated by 2021.	Completed by 2021.
7. Knowledge and technology transfer and adoption	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.
	Grower and miller satisfaction with SRA adoption and communication activities.	Average rating of 4 out of 5 achieved by 2022.
8. Collaboration and capability development	SRA participation and investment in relevant collaborative and cross-sectoral programs, including the Commonwealth's Rural R&D for Profit Program.	Ongoing contribution and support.
	Scholarships awarded to current and future industry participants.	Maintain a minimum of four postgraduate scholarships and two early-career research awards per annum.
	Short-term placements of students and/or professionals in research or industry positions for industry exposure.	At least two placements per annum.
9. Organisational	Investor performance rating for SRA.	Increase from 74% 'high' (2016) to 85% by 2022.
effectiveness	Economic, social and environmental returns from RD&A investments.	Aggregated research investment benefit-cost ratio of 4:1 or above by 2022.
	Governance performance.	Maintain 100% compliance with statutory and contractual requirements.
C. T. S. C.		

Attachment 4: Abbreviations and acronyms

В	Billion						
ccs	Commercial cane sugar						
CRRDC	Council of Rural Research and Development Corporations						
CSIRO	Commonwealth Scientific and Industrial Research Organisation						
Cth	Commonwealth						
DAF	Department of Agriculture and Fisheries (Queensland)						
EM	Extraneous matter						
FATs	Final assessment trials						
GM	Genetically-modified						
GPS	Global positioning system						
HR	Human resources						
IP	Intellectual property						
IT	Information technology						
k	Thousands						
KFAs	Key focus areas						
KPIs	Key performance indicators						
М	Million						
Mt	Million tonnes						
M&E	Monitoring and evaluation Near infrared						
NIR							
NRM	Naturals resources management						
NSW	New South Wales						
PA	Precision agriculture						
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						
SFA	Statutory Funding Agreement						
SRA	Sugar Research Australia Limited						
YCS	Yellow canopy syndrome						

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