

SRA IMPACT REPORT

APRIL – SEPTEMBER 2017

As an investor-funded research organisation, SRA is accountable to report its contribution to the Australian sugar industry goals of increasing profitability, sustainability and capability of the industry. The following impact report is a work-in-progress document to communicate SRA's RD&A impact. It comprises independent cost-benefit analyses on completed investments, output monitoring, a summary of the 2017/18 investment budget across the research pipeline and a one-page summary of harvesting program impact based on available outcomes data.

Ex-post economic evaluations of research investments

Independent economists conducted five ex-post Cost Benefit Analyses (CBA) of SRA and BSES/SRDC research investments completed in the year ending 2016. The aggregated return on total investment for the five projects is 2.23:1. Details are below. These analyses are conducted annually and will be expanded to cover more completed investments in 2018.

Project	PVB ¹ (\$m)	PVC ² (\$m)	NPV ³ (\$m)	BCR ⁴	Notes ⁵
Project 1: 2008/319: Maximising the rate of parental improvement in the Australian sugarcane breeding program	9.23	4.25	4.98	2.17	Impact valued in analysis is increased sugar/ha due to improved varieties expected to be derived from identification of improved parental germplasm lines.
Project 2: 2011/344: New germplasm to develop more productive varieties with enhanced resistance to nematodes, Pachymetra root rot and smut	16.37	2.99	13.38	5.47	Impact valued in analysis is reduced industry costs from nematode damage due to new resistant ratings improving clone selection. There are a number of other potential positive impacts identified but not valued.
Project 3: 2012/013: Implementing a framework for farmers to engage in the use of Precision Technologies	0.00	1.33	-1.33	0.00	No impacts quantified because no evidence of adoption of framework and any potential impact to industry of any adoption is expected to be marginal at best. On reflection, it was thought that a structured approach towards understanding issues related to precision agriculture and identifying things that growers could implement would work. However, the reverse seems to be true – the more structured and formal, perhaps the less growers respond to it. Industry did not see the framework adding value to their existing activities.
Project 4: 2012/025: Development and testing of a SNP marker platform in sugarcane	3.21	2.91	0.30	1.10	Impact valued in analysis is increase in industry sugar/ha driven by improved clones selected with information from the use of this projects DNA testing.
Project 5: 2013/001: Rapid detection of Ratoon Stunting Disease	0.00	1.41	-1.41	0.00	No impacts quantified because output not delivered due to technical challenges. Limited prospects for testing technology to be developed in future. On reflection, this project identified some interesting volative compounds and signature elements, but could not translate that knowledge into a practical test. Instead, there has been more effort poured into other PCR based diagnostics to improve the accuracy of RSD testing.
Aggregate (investment in all projects)	28.81	12.89	15.92	2.23	

1 Present Value Benefits

2 Present Value Costs

3 Net Present Value

4 Benefit Cost Ratio

SUMMARY OF DELIVERED SRA PORTFOLIO OUTPUTS

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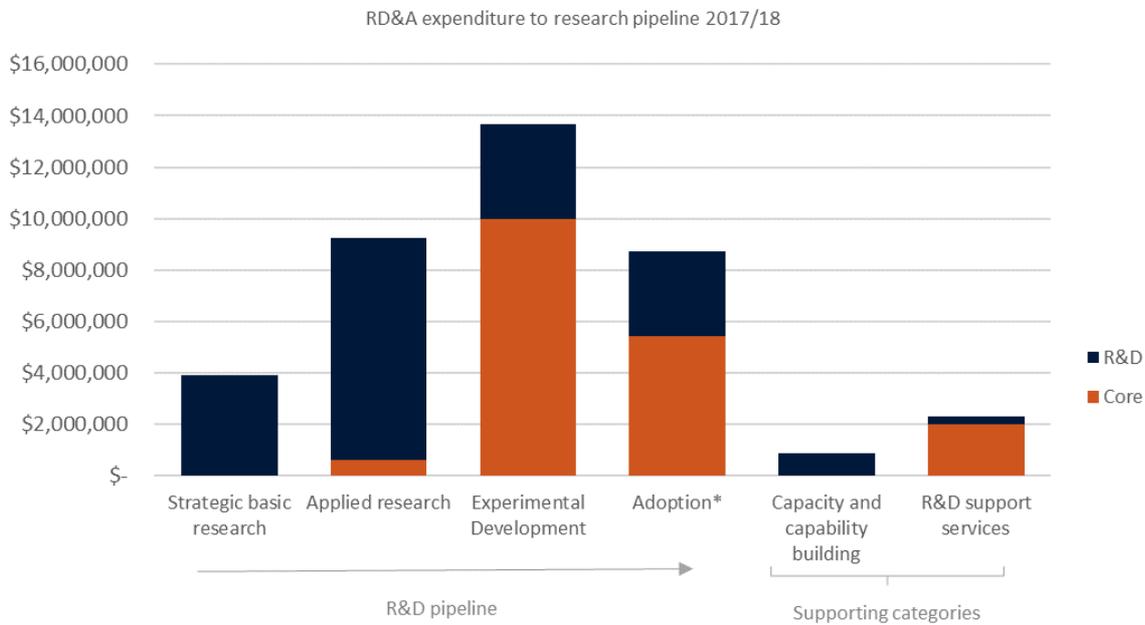
As part of SRA's Monitoring and Evaluation Framework, outputs delivered across the research portfolio are tracked and reported on a bi-annual basis. The following outputs were delivered across the portfolio in the six months to 30 September 2017. Please note that this is not an exhaustive list of outputs, there are ongoing core business outputs occurring across the SRA RD&A portfolio not presented here.

KFA	Outputs	Project	Notes	Research organisation	SRA Program Manager/Chief Investigator
1	Characterisation of genes or genetic regions harbouring disease resistance	2013/358	Delivered ratings for root knot and lesion nematodes, now stored in SPIDNet and will assist in SRA breeding program.	SRA	Harjeet Khanna/ Nathalie Piperidis
	New varieties	PLANNTH PLANCEN	Two new varieties released (Northern and Central).	SRA	Felicity Atkin/George Piperidis
	New introgression material for crossing and testing in Final Assessment Trials	2014/053	Introgression clones producing high value progeny have been identified and further crossing cycles will focus on using these clones.	SRA	Harjeet Khanna/George Piperidis
	Mill Area statistics and varietal composition published data	ANADATA	Available to SRA staff via e-library.	SRA	Jo Stringer
	Recommendations on use of transpiration efficiency for sugarcane breeding	2013/029	It is unlikely that the performance benefits of this trait are being optimally captured (indirectly) in existing breeding programs and recommendations are made for future steps in the Final Report.	CSIRO	Harjeet Khanna/Chris Stokes
	Knowledge of drought tolerance in Chinese sugarcane germplasm	2013805	This project was funded by the Yunnan sugarcane Research Institute (in China) and conducted in China. They are continuing this work for developing drought tolerant sugarcane.	SRA/Yunnan Sugarcane Research Institute China	Prakash Lakshmanan
	Sugarcane germplasm with improved tolerance to water stress, diseases and pests				
Methodology for screening transpiration efficiency of sugarcane	2013806	Some of the learnings of this study will be used in the current project 2016028.	SRA	Prakash Lakshmanan	
Sugarcane with rating for water productivity (quantitative information on test germplasm)					
2	Identification of key organisms responsible for general suppressiveness to nematodes in sugarcane soils	2014/004	Results inform the development of the new Soil Health Program.	Biological Crop Protection Pty Ltd	Felice Driver/ Graham Stirling
	Information of soil biology and crop management to generate a soil food web that is active				
	New research knowledge on the characteristics and performance of controlled release fertilisers	2014/011	These outputs transition into a new SRA project intending to develop a Decision Support Tool for growers.	CSIRO	Felice Driver/ Kristen Verburg
Communication and extension of new knowledge on controlled release fertilisers					
3	Diagnostic test for chlorotic streak disease	2013/357	Diagnostic test now available to productivity services. Variety screening method development continues in new project 2017/010.	SRA	Peter Samson/ Kathy Braithwaite
	Variety screening method for chlorotic streak disease				

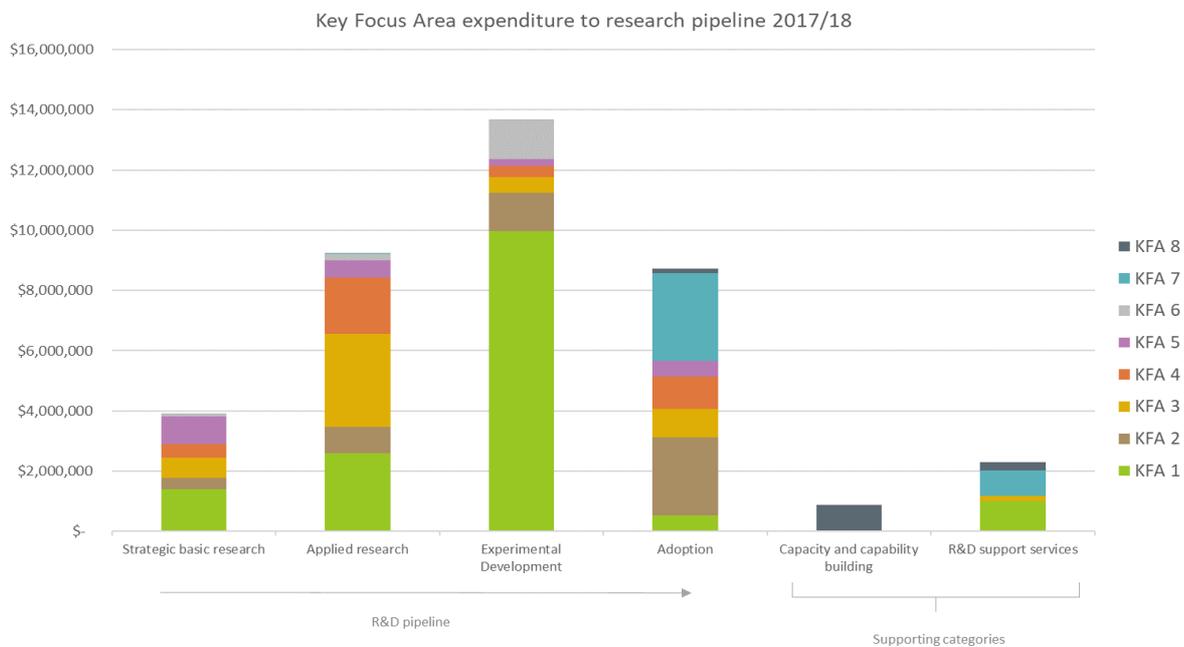
5	Feasibility analysis of harvesting sensors	2016/954	Feasibility analysis completed.	SRA	Peter Samson/ Eloise Keeffe
	Enhanced Software Development for juice laboratories	PLANSPE	Delivered in Meringa and Brandon, yet to be implemented in Mackay.	SRA	Steve Staunton
	Process for coating a mill roll to extend its life and eliminate the need for roll arcing	2013/060	Technique developed but not yet trialed.	QUT	Harjeet Khanna/Geoff Kent
	Description of the chemistry driving the NIR spectroscopic models - Chemical linkage	2014/051	Completed.	SRA	Felice Driver/ Eloise Keeffe
	Knowledge of sucrose loss during extraction	2015/043	Sucrose measurements taken across 2015 and 2016 show that the losses in steam efficient factories were substantial. This information will inform the upcoming blueprint for the introduction of new processing technologies.	QUT	Harjeet Khanna/Ross Broadfoot
7	Aggregated dataset of farm business management data - Herbert region	2014/001	Dataset for 46 farming clients created including financial and mill data. Used to produce individual business intelligence and productivity reports for clients.	Ag Profit Pty Ltd	Felice Driver/Matthew Bryant
	Master classes in soil and biology health Soil/biology health master class training material	2016/025	Master classes held successfully in three locations in 2016/17.	SRA	Felice Driver/ Graham Stirling
8	Capacity building of ECR/MCR - Zhanyin Zhang	2014/402	Completed.	QUT	-
	Capacity development through postgraduate research training - PhD - Joshua Howard	2012/074	Thesis completed.	QUT	-
	Capacity development through postgraduate research training - PhD - Maren Westermann	2013/078	Thesis completed.	UQ	-

SRA 2017/18 EXPENDITURE ALIGNMENT TO R&D PIPELINE

The Annual Operational Plan 2017/18 budget has been aligned to the Research and Development pipeline. There are four pipeline categories (strategic basic research, applied research, experimental development and adoption) and two support categories (industry capacity and capability building and R&D support services).



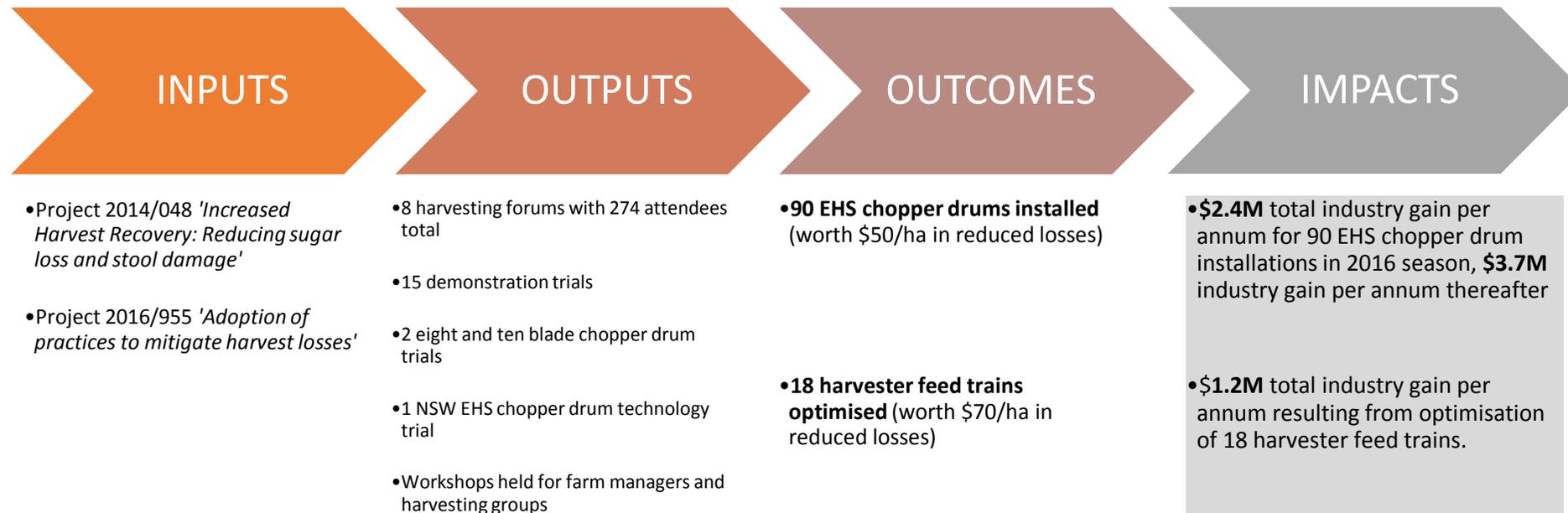
* Note: Core adoption expenditure does not reflect or equate to KFA 7 expenditure. Expenditure includes core adoption budget (\$1.9m), Reef Trust 4 (\$1.6m) and CAS Service and Support, NIR, RSD Laboratory, Spectacane Support, QCaneSelect Support etc. (\$2m).



HARVESTING PROGRAM IMPACT CASE STUDY

This page was included in the 2016/17 Performance Report. As more industry outcome data becomes available, the intent is to create more impact case studies to demonstrate line-of-sight between SRA investments and industry outcomes and impact.

Tangible industry outcomes were identified during the 2016 season and subsequent industry impact was estimated based on a number of assumptions. The following impact pathway was sketched for the SRA Performance report based on inputs and outputs of the harvesting program in 2016/17. Note that the outcomes and impacts reported are realised in part due to previous RD&A.



- The value of feed train optimisation/chopper drum installation and harvesting group 2016 season statistics were provided by EHS Manufacturing.
- Assumed minimum recovered sugar loss of 19% from EHS chopper drum installation valued at \$50/ha.
- Assumed minimum recovered sugar loss of 1% from harvester feed train optimisation valued at \$70/ha.

For more information or to discuss monitoring, evaluation and performance reporting at SRA please contact Brooke Edwards.

GLOSSARY

CBA	Cost Benefit Analysis
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DNA	Deoxyribonucleic acid
ECR/MCR	Early-Career Researcher/Mid-Career Researcher
EHS	EHS Manufacturing (company)
KFA	Key Focus Area
ha	Hectare
NIR	Near-infrared spectroscopy
NPV	Net Present Value
NSW	New South Wales
PCR	Polymerase chain reaction
PhD	Doctor of Philosophy
PVB	Present Value Benefits
PVC	Present Value Costs
RD&A	Research, Development and Adoption
SNP	Single Nucleotide Polymorphism