Sugar Research Australia

DISTRICT PRODUCTIVITY PLAN – FAR NORTH 2023

Introduction

This ***District Productivity Plan – Far North 2023*** has been developed through consultation and engagement undertaken by SRA's Industry Services team with stakeholders across the sugarcane industry supply chain to drive investment at a local, applied level. It is reviewed and updated annually.

Different sources of data have been used as inputs including grower ideas and contributions from past strategic workshops held with SRA, the industry ABARES survey, mill data, impact assessments where applicable and a range of targeted interviews and survey results.

The plan identifies constraints and proposes solutions and actions to address them. The key to success will be implementation which will require leadership, change, and focus. Reporting on progress will occur six monthly.

Version control: March 2023
SRA District Manager Far North, Gavin Rodman

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1 Australian Sugarcane Industry Productivity Goal

The strategic intent for the Australian sugarcane industry is to; utilise the current area under cane to increase productivity by 10% over the next five years. This 10% increase in productivity equates to a 3 million tonne increase in production across Qld and NSW by 2026.

At a sugar price of $500 and 13.5 CCS each tonne of cane has a gross value of $70 per tonne (sugar and molasses). By achieving this productivity improvement goal, the industry will generate an additional $210m in gross revenue.

2 Far North Queensland Overview

Sugarcane is grown in the Far North region on approximately 30,000 hectares. The Far North encompasses all sugarcane grown north of the North Johnstone River, including the Atherton Tableland growing region. It is crushed through two milling companies across three sub sections of the district with a total milling capacity of approximately 3.1million tonnes.

The district has distinct climatic zones ranging from a very wet wet tropic zone, wet tropics zones to dry tropics around Mareeba on the Atherton Tablelands. The sugarcane is crushed at Mossman sugar mill owned by Far Northern Milling, and Mulgrave and Tableland sugar mills, owned by MSF Sugar.

The Far North will seek to improve productivity by 240,000 tonnes by 2026.

3 Productivity Constraints

The Far North Queensland district will 'win' over the next 12 months through focusing on addressing three main priorities.

1. Constraint identification through investigation and analyses to assist future prioritisation and planning
2. Improving CCS through measuring, monitoring and managing crop maturity and ripening, and
3. Increased clean seed distribution and new variety adoption.

Key issues for the district:

- Understanding key agronomic drivers for productivity improvement based on local practices and systems,
    - By identifying constraints to productivity at the mill, farm and block levels, strategies can be developed and implemented to improve their management
- Reducing the impact of RSD, and other diseases, through the improvement of clean seed distribution systems and new variety adoption through management information,
- Improving CCS at harvest,
    - By measuring and monitoring crop maturity, management strategies, such as crop ripeners, which may offer opportunities to improve CCS at harvest.

These three key issues, whilst broad, enable the mill area differences in practices and systems to be acknowledged by creating a specific local mill area activities schedule. The local mill area activities schedules enable flexibility and will be captured in a working document not intended for publication, however some of the larger activities are referred to in section 10 with the implementation and action table. In summary, the main productivity constraints updated in 2022/23 are:

- Constraint identification - potential 180,000 tonnes
- Varietal management, clean seed distribution and new variety adoption – potential 46,000
- Improvement in CCS through measurement, monitoring and management of cane maturity - potential 14,000 tonnes.

4 Productivity data

PRODUCTIVITY SNAPSHOT OF DISTRICT 2021

FAR NORTH QUEENSLAND	Mulgrave	Tableland	Mossman (incl. Tableland)
T Cane harvested	943,355	536,946	733,289
T cane crushed at mill	1,194,977	630,346	639,890
Ha harvested	11,208	5570.7	9,118
Average T cane / ha	84.2	96.4	80.4
5-year average T cane / ha	82.99	98.68	84.43
Average CCS	11.62	14.03	12.29
Average sugar yield	9.78	13.52	9.88
Varieties Top 3 (Total Tonnes)	Q208[A] – 262,604 Q253[A] – 200,509 Q240[A] – 114,807	KQ228[A] – 220,208 Q208[A] – 140,329 Q183[A] – 54,090	Q208[A] – 334,409 KQ228[A] – 129,457 Q240[A] – 65,244
Varieties (top 3 average sugar yield, >10,000t delivered to mill)	SRA15[A] – 12.64 SRA6[A] – 11.45 SRA3[A] – 11.14	Q240[A] – 15.44 Q183[A] – 14.16 KQ228[A] – 13.77	KQ228[A] – 14.08 Q240[A] – 10.50 Q253 – 9.89
Mill owners	MSF Sugar	MSF Sugar	Far Northern Milling
Clean seed uptake (% hectares)	0.08	0	TCL – 0.39 MAS – 0.07
Tissue culture uptake (% hectares)	0	0	0

Note: Data for the 2022 season was not fully available at the time of writing this plan but 2.546 million tonnes of cane was crushed through the three sugar mills.

5 Far North Queensland Productivity Goal

By 2026 tonnes of cane harvested will increase from 31 million tonnes to 34 million tonnes across the Australian industry. The Far North will seek to deliver its proportionate share of this growth (approximately 240,000 tonnes) through the implementation of activities and strategies that address the three priority areas of focus identified for 2022 and beyond. These priorities will be reassessed annually with six monthly updates on progress.

The way that the Far North district will 'win' in 2023 is through focusing on addressing – constraint identification through investigation and analyses to assist future prioritisation and planning, improving CCS through measuring, monitoring and managing crop maturity and ripening, and increased clean seed distribution and new variety adoption.

6 District Priorities

PRIORITY	OBJECTIVES
Constraint identification	**Improve productivity through investigation and analysis of productivity constraints and develop and extend management strategies** ○ Develop plans to implement strategies for productivity improvement in collaboration with industry through education, knowledge transfer and adoption of best practice and tools. ○ Establish baseline data for key pest, disease and weed prevalence through data collection and measurement ○ Develop weed management strategies for navua sedge, balsam pear, and itch grass by 2024 to reduce impact of these weeds by 33,000 tonnes across the Far North. ○ Wet Tropics soil management reference booklet and extension program.
Varietal management, clean seed distribution and new variety adoption	**Increased adoption of new varieties through variety management and improved clean seed distribution** ○ Development and support of effective clean seed distribution strategies though the adoption of best practice ○ Reduced impact from RSD on-farm by138,000 tonnes by 2026 through education, improved measurement and improved clean seed distribution systems. ○ Clean seed plot improvement through adoption of best practice ○ Building confidence to support the adoption of new varieties through the development and support of regional variety management groups and data collection for shared learning.
Improvement in CCS through measurement, monitoring and management of cane maturity	**Understand factors influencing CCS variability and develop and extend management strategies** ○ Mulgrave CCS Improvement project ○ Improve understanding of factors influencing CCS ○ Review of CCS variability in Mulgrave and improve problem definition ○ CCS improvement through ripeners ○ Improve understanding of ripener efficacy, crop parameters and management opportunities by December 2023 ○ Support an increased proportion of tonnes harvest at the optimum time and/or at <70% moisture through demonstrating measuring, monitoring and management strategies.

6.1 District Stakeholder Analysis

Stakeholders that SRA works with to improve productivity in the region include the following grower organisations, mills and productivity companies.

Stakeholder type	Mulgrave (includes Babinda)	Tableland	Mossman (includes Tableland)
Milling companies	MSF Sugar	MSF Sugar	Far Northern Milling
Grower representative organisations	CANEGROWERS Cairns Region	CANEGROWERS Tableland	CANEGROWERS Mossman CANEGROWERS Tableland ACFA
Productivity companies	MSF Sugar Innisfail and Babinda Cane Productivity Services (IBCPS)	MSF Sugar	Mossman Agricultural Services (MAS) CANEGROWERS Tableland
Regional variety committees	Northern Regional Variety Committee		

7 Recent stakeholder engagement events and activities delivered for impact

Transforming research findings into tools, products and services that save the industry time and money and improve environmental performance is a strategic initiative for SRA.

The following recent engagement events delivered through SRA demonstrate the service model and are examples of where SRA works to effectively bridge the gap between research and practice to improve district productivity. Key stakeholder engagement has occurred with the following industry groups to develop the district productivity plan through a combination of one-on-one and group meetings; CANEGROWERS Mossman, Mossman Agricultural Services, Far Northern Milling, CANEGROWERS Tableland, MSF Sugar, CANEGROWERS Cairns Region, ACFA, Innisfail Babinda Cane Productivity Services, and growers throughout the Far North.

	DELIVERED THROUGH SRA	DELIVERY PARTNER EXTERNAL TO SRA
Services and projects, assistance with growers provided through on farm trials	***Cane to Creek 2.0*** • 2018 – 2021 • Improved knowledge of correct application of imidacloprid, the SIX EASY STEPS program, new herbicides and water quality monitoring processes and purposes.	• Australian Government's Reef Trust • Queensland Department of Agriculture and Fisheries • Burdekin Bowen Integrated Floodplain Management Advisory Committee • Burdekin Productivity Services • Mossman Agricultural Services • Tully Sugar / COFCO

	Mackay Whitsunday Cane to Creek • 2020 – 2023 • Improved knowledge of correct application of imidacloprid, the SIX EASY STEPS program, and water quality monitoring processes and purposes.	• Australian Government's Reef Trust • Great Barrier Reef Foundation • Mackay Area Productivity Services • Plane Creek Productivity Services
	Complete nutrient management planning for the Russell-Mulgrave and Lower Barron catchments • 2020 - 2022 • Agronomic service and nutrient management plans developed for 100 farms over two years • Achieve the adoption of all six steps of the SIX EASY STEPS • Knowledge of paddock-scale nutrient budgets and their effect on water quality • Improved water quality outcomes in the Russell-Mulgrave Catchment through nutrient management planning	• Australian Government's Reef Trust • Queensland Department of Environment and Science
	Burdekin irrigation: Increasing industry productivity and profitability through transformational, whole of systems sugarcane approaches that deliver water quality benefits • 2020 - 2024 • Transition growers to proven world class scalable, sustainable and technologically advanced practices in irrigation management • Take a whole-of-systems approach that includes water quality monitoring to ensure other priority issues such as improving nutrient and pesticide management are captured • Maximise industry profitability through smarter irrigation practices • Standardise the process of grower engagement, to a powerful, multi-partnered and cooperative approach that will deliver more value to growers, investors and industry stakeholders • Work across organisations to maximise outcomes from strategic coordination, collaborative linkages and consistent messaging	• Australian Government's Reef Trust • Great Barrier Reef Foundation • Farmacist • AgriTech Solutions • Burdekin Productivity Services • Burdekin Bowen Integrated Floodplain Management Advisory Committee • James Cook University • Queensland Department of Agriculture and Fisheries NQ Dry Tropics
	Smarter Irrigation for Profit – Phase 2 • 2019 – 2022 • Improved irrigation knowledge and skills of sugar extension and productivity staff by building their capacity to measure and assess irrigation systems • Establishment of irrigation innovation training hubs across four sugarcane regions – Tableland, Burdekin, Central and Southern • A readily accessible resource bank storing participant materials, case studies, information sheets, instructional videos, workbooks and webinar series: smarterirrigation.com.au/industry/sugar/ • Establishment of demonstration sites in the Bundaberg region, which can be used to evaluate and demonstrate precision automated furrow irrigation • Development of design guidelines and indicative system costs and benefits • Tools which can interrogate and analyse the data collected by the automation system for improved irrigation decisions	• Australian Government Department of Agriculture, Water and the Environment (Rural R&D for Profit) • Queensland Department of Agriculture and Fisheries • Cotton Research and Development Corporation

	Support of cane farmer trials of enhanced efficiency fertilisers in the catchments of the Great Barrier Reef • 2016 - 2022 • To identify when and where enhanced efficiency fertilisers (EFFs) can provide a significant increase in nitrogen use efficiency (NUE) and reduction in nitrogen losses, resulting in a more profitable and sustainable farming business • To generate data on the performance of commercial EEF products on farm productivity, economics, NUE, N rates • Produce robust information for inclusion in industry fertiliser recommendations through decision support tool • Case studies that demonstrate the economic returns of EEFs vs. conventional fertilisers	• Australian Government's Reef Trust • Great Barrier Reef Foundation
	On ground testing and modelling of the effectiveness of enhanced efficiency fertilisers in the Wet Tropics catchments of the Great Barrier Reef • 2020 - 2022 • Knowledge about when and where to use EEFs in place of urea that will lead to reduced N losses while at least maintaining and potentially improving yield • Agronomic and economic information growers can use to make informed decisions on how best to utilise EEF's in their farming systems • Decision support tool developed to guide growers on selecting appropriate EEFs • An industry publication that summarises key findings and guide for growers	• Australian Government's Reef Trust • Great Barrier Reef Foundation • CSIRO • CANEGROWERS • Productivity Service Companies
	Advancing techniques for diagnosis of Yellow Canopy Syndrome • 2019 – 2023 • In-field epidemiology and dynamics of both yellow canopy syndrome and likely causal agents at species level • Development of a molecular diagnostic approach to characterise the insect species likely to be involved as causal agents • Rapid in-field diagnostics for the causal agent and/or YCS symptom expression.	• Australian Government Department of Agriculture, Water and the Environment (Rural R&D for Profit) • Grains Research Development Corporation • Cotton Research & Development Corporation • Hort Innovation • Wine Australia • Forest & Wood Products Australia
	Beyond imidacloprid – Chemical and biorational alternatives for managing canegrubs • 2020 – 2025 • Build on existing commercial relationships with three agrochemical companies to select and screen alternative compounds to imidacloprid canegrub control • Evaluate novel and existing insecticidal compounds against canegrubs in selected cane-growing regions • Evaluate the run-off loss risk of the compounds in the wet season and irrigated conditions • Engage with all stakeholders to generate support for a new approach to control canegrubs • Develop a field data set that supports the registration of effective compounds	• Queensland Department of Agriculture and Fisheries

	SIX EASY STEPS – continuing perspectives in time and space • 2017 - 2022 • Establish a mechanism to update the SIX EASY STEPS knowledge base and guidelines (specifically N) when sound scientifically based information becomes available from various R&D sources. • Link to other current and planned projects to develop sets of district-specific guideline tables that indicate when and how to adjust the baseline SIX EASY STEPS guidelines away from 'normal' circumstances. • Provide specific N guidelines and nitrogen use efficiency (NUE) data from continuing for new field trials associated with aspects of temporal/spatial management options. • Update the SIX EASY STPES technology transfer mechanisms.	• University of Southern Queensland
	Harvester losses assessment by real-time Machine Vision Systems • 2019 – 2022 • Identify machine vision sensing technologies that could be used for real-time estimation of harvester losses. • Proof-of-concept cane loss sensing equipment and algorithms • Proof-of-concept sensing technology to detect cane losses	• University of Southern Queensland
	Maximising cane recovery through development of a harvesting decision support tool • 2020 – 2023 • An updated base agronomic/economic model • An online, freely available decision support tool with an easy-to-use interface • Knowledge from analysis of additional burned cane data which allows industry to make economic decisions in a burned cane environment	• Queensland Department of Agriculture and Fisheries
	Australian sugarcane industry soil health benchmarking in the Wet Tropics region of QLD – increasing profit and transforming soil health practices through cooperative industry research, extension and adoption • 2019 – 2021 • Provide evidence of the benefits of adopting improved farming system practices on soil health and subsequent advantages to business productivity, profitability and sustainability. • Establish soil health benchmarks to be used in soil, pest and root test interpretation. • Verify a subset of soil chemical, physical, and biological indicators to describe soil health and measure soil response to practice adoption. • Create a network of more knowledgeable soil health service providers, led by engaged trusted private technical specialists to improve capability to transfer knowledge, skills and solution strategies to growers. • Provide training and local validation of the "Soil Health Ute Toolkit", to be used in-field with growers. • Identify soil, production and profit constraints caused by current practices and build capability to address impediments.	• Australian Government Department of Agriculture, Water and the Environment (National Landcare Program) • Queensland Department of Agriculture and Fisheries • T.R.A.P Services

	Developing an integrated device for on-farm detection of sugarcane diseases • 2020 – 2023 • A hand-held diagnostic device that can accurately detect specific pathogens in sugarcane samples in the field. • Validation of integrated device as an on-farm diagnostic tool for surveillance and monitoring, focussing on RSD as a target disease.	• Australian Research Council • Griffith University

8 Events Scheduled

DATE	EVENT	TOPICS
1-3 March	Far Northern Updates	Varieties, sugarcane maturity and ripeners, pachymetra
18 April	SRA Meringa Field Day	Various
14-16 June	Far Northern Updates	Chemical update, weeds trial results, imidacloprid alternatives, greyback canegrub control
13-15 September	Far Northern Updates	Nutrient management

NOTE: Additional events including training and field walks will be organised throughout the year.

9 Implementation Strategy and Actions

The following tables presents activities and their corresponding strategic targets, which are common across some or all of the mill areas within the Far North. This table is not an exhaustive list of activities, with a second working document to be produced where necessary with greater detail to support collaborating organisations to deliver agreed upon activities at a local level and sub region.

All activities will address the three prioritised constraint areas.

1. Constraint identification
2. Varietal management, clean seed distribution and new variety adoption
3. Improvement in CCS through measurement, monitoring and management of cane maturity.

Reporting on progress will occur regularly with key stakeholders.

SRA will update this document to reflect current activity delivered, including in collaboration with other delivery partners, that will deliver research and contribute towards achieving the district productivity goal.

9.1 Constraint identification

Investments in this priority will improve productivity through investigation and analysis of productivity constraints and develop and extend management strategies.

Activities include:

- Develop plans to implement strategies for productivity improvement in collaboration with industry through education, knowledge transfer and adoption of best practice and tools.
- Establish baseline data for key pest, disease and weed prevalence through data collection and measurement
    - Develop weed management strategies for navua sedge, balsam pear and itch grass by 2024 to reduce impact of these weeds by 33,000 tonnes
    - Wet tropics soil management reference booklet and extension program
    - Support development of RSD detection technologies

Activities will be delivered in collaboration with growers, ACFA, IBCPS, MSF Sugar, USQ, Mossman Agricultural Services and Far Northern Milling with other collaborators to be confirmed.

INVESTMENT RATIONALE	ACTIVITY/ PROJECT	OUTPUT/ SOLUTION	SHORT-TERM OUTCOMES	MEDIUM-TERM OUTCOMES	LONG-TERM OUTCOMES	ACHIEVEMENT IN 12 MONTHS
Increase in productivity per hectare by approximately 5%, contributing to improved supply of cane to mills and improved mill viability.	Develop management strategies for balsam pear.	Research outcome for control of balsam pear.	Three pot trials to investigate the efficacy of post-emergent herbicide brews.	Growers actively using effective post-emergent control strategies for balsam pear. Investigate pre-emergent herbicide efficacy.	Improvement in yield due to reduced balsam pear infestations.	Two balsam pear post-emergent pot trials are complete. Trial results to-date have been shared at industry meetings.
	Develop management strategies for navua sedge.	Research outcome for control of navua sedge.	Two field trials to investigate the efficacy of post-emergent herbicide brews.	Growers actively using effective post-emergent control strategies for navua sedge. Investigate pre-emergent herbicide efficacy.	Improvement in yield due to reduced navua sedge infestations.	Two navua sedge post-emergent field trials are complete. Trial results to-date have been shared at industry meetings.A third field trial has been established by QDAF and Federation University, supported by SRA.

	Develop management strategies for itch grass	Research outcome for control of itch grass.	Two field trials to investigate the efficacy of pre-emergent herbicide brews.Identify germination protocol for pot trials.	Growers actively using effective pre-emergent control strategies for itch grass.	Improvement in yield due to reduced itch grass infestations.	Two itch grass pre-emergent field trials are complete. Trial results to-date have been inconclusive, due to field variation and poor post-emergent control.
	Investigate efficacy of herbicides registered for aerial application on vine species.	Research outcome for application of registered herbicides for aerial application.	Pot trials to investigate the efficacy of post-emergent herbicide brews registered for aerial application.	Growers actively using effective post-emergent control strategies for vine species that are registered for aerial application.	Improvement in yield due to reduced late or wet season vine infestations.	Pot trial has been established with balsam pear, red convolvulus, pink convolvulus, centro and calopo.
	Wet tropics soil management reference booklet and extension program Increased understanding of soil characteristics and management strategies for Wet Tropics – Coastal areas	Wet Tropics soil management reference booklet and extension program Identification of soil constraints. Identification of opportunities for improvement.	Develop Wet Tropics soil management reference booklet. Deliver extension activities and training events focussed on soil management.	Increased understanding of soil characteristics and management strategies for Wet Tropics – Coastal areas. Identification of soil constraints. Identification of opportunities for improvement.	Development of useful information and strategies to manage identified soil constraints.	Project has received funding from the National Landcare Program's Small Farms / Smart Farms. Wet Tropics soil management reference booklet is in draft. Several extension activities and training events have been delivered in 2022.
	Trialling of novel RSD technologies at the mill	Development of RSD detection technologies at the mills to support RSD incidence benchmarking and data collection	Develop and trial RSD detection technologies	RSD incidence mapping across mill areas involved in trials	Adoption of technologies by all mills in the Far North	Trial activities have been undertaken in South Johnstone and Mossman in the Far North, along with other mills within the Australian sugar industry.

9.2 Sugarcane maturity and CCS improvement

Investments in this priority will enable understanding of the factors influencing CCS variability and develop and extend management strategies. Activities will include:

- Improve understanding of factors influencing CCS
  - Review of CCS variability in Mulgrave and improve problem definition by December 2023
  - Review of CCS variability in Mossman and improve problem definition by December 2023
- CCS improvement through ripeners
  - Improve understanding of ripener efficacy, crop parameters and management opportunities by December 2023
- Support an increased proportion of tonnes harvested at the optimum time and/or at <70% moisture through demonstrating measuring, monitoring and management strategies

Activities will be delivered in collaboration with CANEGROWERS Cairns Region, MSF Sugar, Far Northern Milling, CANEGROWERS Mossman, Mossman Agricultural Services, growers and other collaborators to be confirmed and are encouraged to contact the district manager, Gavin Rodman.

INVESTMENT RATIONALE	ACTIVITY/ PROJECT	OUTPUT/ SOLUTION	SHORT-TERM OUTCOMES	MEDIUM-TERM OUTCOMES	LONG-TERM OUTCOMES	ACHIEVEMENT IN 12 MONTHS
Identify opportunities to improve CCS at harvest through a better understanding of in-field factors and management strategies.	Mulgrave CCS Improvement Project	Increased proportion of cane being harvested at optimum maturity. Decreased extraneous matter in cane supply. Improved understanding of management practices influencing CCS.	Engage a group of ten growers to review productivity and practice data since 2010. Identify parameters for further investigation. Demonstrate impact of maturity at harvest.	Investigate identified parameters. Demonstrate maturity management within the farming system.	Improvement in yield and CCS due to a greater proportion of cane being harvested mature. Decrease in extraneous matter in cane supply. Adoption of management strategies that improve CCS.	Two project meetings delivered. Productivity data summaries delivered to each participating grower. Pachymetra and row profile surveys have commenced (including Babinda with support from IBCPS). Data review ongoing.

	Mossman CCS Improvement Project	Increased proportion of cane being harvested at optimum maturity. Decreased extraneous matter in cane supply. Improved understanding of management practices influencing CCS.	Engage a group of six growers to review productivity over an extended period. Identify parameters for further investigation. Demonstrate impact of maturity at harvest.	Investigate identified parameters. Demonstrate maturity management within the farming system.	Improvement in yield and CCS due to a greater proportion of cane being harvested mature. Decrease in extraneous matter in cane supply. Adoption of management strategies that improve CCS.	Project commenced in February 2023.
	Improve understanding of ripener efficacy, crop parameters and management opportunities	Development of parameters for profitable application of ripeners.	Twenty field trials over 2022 and 2023 to establish a moisture in cane range for profitable applications of trinexapac-ethyl.	Investigate new methodologies to measure moisture in cane. Growers actively using ripeners when moisture in cane is within the identified profitable range.	Growers are measuring crops to track maturity and using ripeners where necessary.	Eleven trials were harvested in 2022. Early indications from these trials is that the profitable range is between 71%-75% moisture in cane. Further validation is required.

9.3 Increased clean seed distribution and variety adoption

Investments in this priority will increase adoption of new varieties through variety management and improved clean seed distribution. Activities will include:

- Development and support of effective clean seed distribution strategies though the adoption of best practice
  - Reduced impact from RSD on-farm by 138,000tonnes by 2026 through education, improved measurement and improved clean seed distribution systems.
- Clean seed plot improvement through adoption of best practice
- Building confidence to support the adoption of new varieties through the development and support of regional variety management groups and data collection for shared learning

The activities will be implemented in collaboration with Mossman Agricultural Services, Tablelands Canegrowers, MSF Sugar, IBCPS, and other collaborators to be confirmed.

INVESTMENT RATIONALE	ACTIVITY/ PROJECT	OUTPUT/ SOLUTION	SHORT-TERM OUTCOMES	MEDIUM-TERM OUTCOMES	LONG-TERM OUTCOMES	ACHIEVEMENT IN 12 MONTHS
Increased clean seed and new variety adoption are critical in improving productivity. Improved clean seed distribution systems can significantly improve the levels of RSD infection in a district. It is estimated that productivity can be improved by 138,000 tonnes with improved access to clean seed.	IBCPS clean seed plot review and upgrade roadmap	Improved clean seed distribution systems in the South Johnstone mill area.	Develop roadmap for improvement of clean seed distribution system. Establish Mother Plot at Martyville. Identify variety mix to propagate in clean seed plots to improve productivity.	Establish additional distribution plots across the district.	Sufficient quantities of clean seed, and the right variety mix, to service the South Johnstone mill area and reduce the RSD impact on productivity.	Workshop held with IBCPS Board in January 2022. Upgrade roadmap developed by SRA in consultation with IBCPS. Mother plot established. Variety mix review and updated with SRA Variety Development Manager Far North.
	Clean seed plot reviews for Mulgrave,	Improved clean seed distribution systems in	Review clean seed distribution systems.	Establish additional distribution plots	Sufficient quantities of clean seed, and the	These reviews are commencing in 2023.

	Mossman and Tableland.	the Mulgrave, Mossman and Tableland.	Identify variety mix to propagate in clean seed plots to improve productivity.	across the district or distribution methods.	right variety mix, to service these mill areas and reduce the RSD impact on productivity.	
	Variety management and new variety adoption through additional data collection and demonstration.	Additional information for new varieties to support adoption.	Germination demonstration plots for clones at the maximum propagation stage (pre-commercial release) in Babinda. Support existing demonstration plots.	Share information across districts to gather additional information on new varieties to build confidence..	Increased adoption rate of new varieties, leading to improved productivity outcomes.	Germination counts on clones considered for commercial release on three sites in Babinda in 2021 and 2022. SRA32 tissue culture purchased and delivered to productivity services to reduce release window by one year. Procurement process underway for mobile mill to support CCS curve development on the Tableland.

10 Ongoing review to measure impact

This District Productivity Plan will be updated every 6 months with progress reports and reviewed annually to then determine the next plan, track progress and measure impact.

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