Sugar Research Australia

# SUGAR RESEARCH AUSTRALIA DISTRICT PRODUCTIVITY PLAN – FAR NORTH QUEENSLAND 2024

## Brief Introduction

The District Productivity Plans have been developed through consultation and engagement undertaken through the Industry Services SRA team, across the sugarcane industry supply chain to identify constraints. Different sources of data have been used as inputs including grower ideas and contributions from past strategic workshops held with SRA, the recent ABARES survey, mill data, impact assessments where applicable and a range of targeted interviews and survey results.

The plans highlight these issues with proposed solutions and actions to address them and will be updated and reviewed annually to drive investment at a local, applied level. Reporting on progress will occur six monthly. The key to success will be implementation which will require leadership, change and focus.

# 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 Tableland growing region. It is crushed through two milling companies across three sub sections of the district, with a total milling capacity of approximately 3.1 million tonnes.

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

# 3 Productivity Constraints

The Far North Queensland district will succeed in its productivity goals over the next 12 months by focusing on addressing three main priorities – constraint identification and management through investigation and analyses; improving CCS through measuring, monitoring and managing crop maturity and ripening and 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.
    - In 2024, weed management and irrigation management will take greater focus.
- Reducing the impact of RSD, Pachymetra and other diseases, through the improvement of clean seed distribution systems and new variety adoption through improved 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.
    - Through implementation or improvement of on-farm practices identified in the Mulgrave CCS Improvement Project

These three key issues, whilst broad, enable the mill area's differences in practices and systems to be acknowledged through a 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 8 with the implementation and action table. In summary, the main productivity constraints for 2024 are:

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

## 4 Productivity data

**PRODUCTIVITY SNAPSHOT OF DISTRICT 2023**

| FAR NORTH QUEENSLAND | Mulgrave (including transfer cane) | Tableland (including toll crush cane) | Mossman (coastal) |
|---|---|---|---|
| **T Cane harvested** | 1,003,662<br>(171,636) | 622,218<br>(137,245) | 341,610 |
| **Ha harvested** | 11,036 | 8,329 | 5,027 |
| **Average T cane / ha** | 90.94 | 91.18 | 67.96 |
| **5 year average T cane / ha** | 86.0 | 96.67 | 70.34 |
| **Average CCS** | 11.98 | 13.8 | 11.78 |
| **Average sugar yield** | 10.90 | 12.59 | 8.00 |
| **Varieties Top 3 (Total Tonnes)** | Q253 – 224,492<br>Q208 – 217,939<br>SRA26 – 119,348 | KQ228 – 344,565<br>Q208 – 180,588<br>Q240 – 144,776 | Q208 – 149,536<br>SRA26 – 33,512<br>Q240 – 25,640 |
| **Varieties (top 3 average sugar yield, >10,000t delivered to mill)** | SRA28 – 13.91<br>SRA15 – 13.08<br>SRA26 – 13.06 | Q240 – 15.01<br>KQ228 – 13.69<br>Q208 – 11.84 | SRA28 – 11.51<br>SRA15 – 10.84<br>SRA26 – 10.53 |

## 5 Far North Queensland productivity goal

By 2026, the overarching goal is that 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 2024 and beyond. These priorities will be reassessed annually with six monthly updates on progress.

The way that the Far North district will 'win' over the next 12 months is by focusing on addressing – constraint identification and management through investigation, improving CCS through measuring, monitoring and managing crop maturity and other in-field factors, 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**<br>○ Develop plans to implement strategies for productivity improvement in collaboration with industry through education, knowledge transfer and adoption of best practice and tools.<br>○ Demonstrate irrigation automation and optimisation tools and strategies on the Atherton Tableland<br>○ Establish baseline data for key pest, disease and weed prevalence through data collection and measurement. |

| | |
|---|---|
| *Continued…* | ○ Develop weed management strategies for navua sedge, balsam pear and itch grass by 2024 to reduce impact of these weeds across the Far North.<br>○ Develop and extend the 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, communications activities and improved clean seed distribution**<br>○ Development and support of effective clean seed distribution strategies though the adoption of best practice<br>○ Reduced impact from RSD and Pachymetra root rot on-farm through education, improved measurement and improved clean seed distribution systems.<br>○ Clean seed plot improvement through adoption of best practice<br>○ 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**<br>○ Mulgrave CCS Improvement Project<br>○ Improve understanding of factors influencing CCS.<br>○ Review of CCS variability in Mulgrave and improve problem definition.<br>○ Support implementation of initial findings on-farm.<br>○ CCS improvement through ripeners<br>○ Support development of crop maturity (brix/moisture) calibration for MicroNIR equipment for rapid in-field assessments.<br>○ Support an increased proportion of tonnes harvested at the optimum time and/or at <70% moisture through demonstrating measuring, monitoring and management strategies |

### 6.1 District Stakeholder Analysis

Snapshot of the region grower organisations, mills and productivity companies that SRA works with to improve productivity for the region.

| Stakeholder type | Mulgrave (incl. Babinda) | Tableland | Mossman |
|---|---|---|---|
| Milling companies | MSF Sugar | MSF Sugar | Far Northern Milling |
| Grower representative organisations | CANEGROWERS Cairns Region | CANEGROWERS Tableland<br><br>ACFA | CANEGROWERS Mossman<br><br>CANEGROWERS Tableland<br><br>ACFA |
| Productivity companies | MSF Sugar<br>IBCPS | MSF Sugar | Mossman Agricultural Services (MAS) |

| *Continued…* Regional variety committees | Northern Regional Variety Committee | | |
|---|---|---|---|
| X-large and large growers (>20,000 tonnes) | <15 | <10 | <5 |
| Medium growers (8,000-20,000 tonnes) | <50 | <10 | <15 |
| Small growers (<8,000 tonnes) | >150 | >30 | <40 |

## Implementation Strategy and Actions

The table below 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.

- Constraint identification and management
- Varietal management, clean seed distribution and new variety adoption
- Improvement in CCS through measurement, monitoring and management of cane maturity and other in-field factors

Reporting on progress will occur regularly with key stakeholders. SRA will update this document to reflect current activities delivered through SRA, including in collaboration with other delivery partners, that will deliver research and contribute towards achieving the district productivity goal.

### 6.2 Constraint identification

Investments in this priority will improve productivity through investigation and analysis of productivity constraints, as well as developing and extending management strategies. Activities will 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
- Wet tropics soil management reference booklet and extension program
- Support development of RSD detection technologies

Activities will be delivered in collaboration with local stakeholders and other collaborators yet to be confirmed.

| INVESTMENT RATIONALE | ACTIVITY/ PROJECT | OUTPUT/ SOLUTION | SHORT-TERM OUTCOMES | MEDIUM-TERM OUTCOMES | LONG-TERM OUTCOMES | ACHIEVEMENT TO DATE |
|---|---|---|---|---|---|---|
| Increased productivity through identification of productivity constraints and development of management strategies to use on-farm. | Develop management strategies for balsam pear. | Research outcome for control of balsam pear. | Pot trials to investigate the efficacy of pre-emergent herbicide options. | Growers actively using effective pre- and post-emergent control strategies for balsam pear. | Improvement in yield due to reduced balsam pear infestations. | Three balsam pear post-emergent pot trials are complete. Trial results to-date have been shared at industry meetings and in the 2023/24 Summer edition of CaneMatters. |
| | Develop management strategies for navua sedge. | Research outcome for control of navua sedge. | Further investigate the impact of glyphosate application timing in fallow and subsequent pre-emergent options in plant cane. | Growers actively using effective post-emergent control strategies for navua sedge in fallow. | Improvement in yield due to reduced navua sedge infestations. | Two navua sedge post-emergent field trials are complete with a third established to further investigate glyphosate application timing in fallow and |

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|---|---|---|---|---|---|---|
| *Continued…* | | | | | | subsequent pre-emergent options in plant cane. Trial results to-date have been shared at industry meetings. A fourth 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. | Identify germination protocol for pot trials.<br><br>Identify efficacious pre-emergent options for trash blanketed ratoons.<br><br>Establish pot trials to investigate pre-emergent options. | Growers actively using effective pre-emergent control strategies for itch grass.<br><br>Containing itch grass to known infestations without further spread. | 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.<br><br>Investigations into germination protocols for pot trials have been unsuccessful. Additional protocol development underway. |

| INVESTMENT RATIONALE | ACTIVITY/ PROJECT | OUTPUT/ SOLUTION | SHORT-TERM OUTCOMES | MEDIUM-TERM OUTCOMES | LONG-TERM OUTCOMES | ACHIEVEMENT TO DATE |
|---|---|---|---|---|---|---|
| *Continued…* | Investigate efficacy of herbicides registered for aerial application on vine species. | Research outcome for application of registered herbicides for aerial application. | Investigate efficacy of new 2,4-D permit conditions for aerial application.<br><br>Investigate residues in crop over time to support MCPA label change. | Growers actively using effective post-emergent control strategies for vine species that are registered for aerial application.<br><br>Increase options for aerial and above canopy control. | Improvement in yield due to reduced late or wet season vine infestations. | Pot trial has been completed with balsam pear, red convolvulus, pink convolvulus, centro and calopo. Results have been shared through local meetings and in the 2023/24 Summer edition of Cane Matters. |
| | Develop Wet Tropics soil management reference booklet and extension program<br><br>Increased understanding of soil characteristics and management strategies for Wet Tropics – Coastal areas | Develop Wet Tropics soil management reference booklet and extension program<br><br>Identification of soil constraints.<br><br>Identification of opportunities for improvement. | Develop Wet Tropics soil management reference booklet.<br><br>Deliver extension activities and training events focussed on soil management. | Increased understanding of soil characteristics and management strategies for Wet Tropics – Coastal areas.<br><br>Identification of soil constraints.<br><br>Identification of opportunities for improvement. | Development of useful information and strategies to manage identified soil constraints. | Project continues to be undertaken in collaboration with Professor Bernard Schroeder from the University of Southern Queensland and SRA through funding from the Australian Government's National Landcare Program.<br><br>Wet Tropics soil management reference booklet is in draft. |

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|---|---|---|---|---|---|---|
| *Continued…* | | | | | | Several extension activities and training events have been delivered in 2023. |
| | Mossman Productivity Improvement Project | Increased proportion of cane being harvested at optimum maturity.<br><br>Decreased extraneous matter in cane supply.<br><br>Improved understanding of management practices influencing CCS. | Engage a group of six growers to review productivity over an extended period.<br><br>Identify parameters for further investigation.<br><br>Demonstrate impact of maturity at harvest. | Investigate identified parameters.<br><br>Demonstrate maturity management within the farming system. | Improvement in yield and CCS due to a greater proportion of cane being harvested mature.<br><br>Decrease in extraneous matter in cane supply.<br><br>Adoption of management strategies that improve CCS. | Project commenced in February 2023. |
| | Pachymetra root rot impact. | Pachymetra root rot baselines for mill areas within the Far North. | Conduct a Pachymetra root rot survey of the Atherton Tablelands.<br><br>Extend results of recently completed surveys to industry. | Growers routinely sampling for Pachymetra and selecting suitably resistant varieties. | Routine Pachymetra surveys to assess productivity impact. | Three Pachymetra root rot surveys completed across Mossman, Mulgrave and Babinda.<br><br>>60% of samples were above the high economic threshold. |
| | Irrigation | Improve irrigation management to support improved yields. | Demonstrate automation and optimisation tools and strategies on-farm. | Increase number of growers using site specific data to manage irrigation. | Growers using site specific data and on-farm tools to improve irrigation practices. | New project to commence in 2024. |

### 6.3 Sugarcane maturity and CCS improvement

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

- Support implementation or improvement of practices identified in the Mulgrave CCS Improvement Project
- Support an increased proportion of tonnes harvested at the optimum time and/or at <70% moisture through demonstrated measuring, monitoring and management strategies

Activities will be delivered in collaboration with local stakeholders and other collaborators yet to be confirmed.

| INVESTMENT RATIONALE | ACTIVITY/ PROJECT | OUTPUT/ SOLUTION | SHORT-TERM OUTCOMES | MEDIUM-TERM OUTCOMES | LONG-TERM OUTCOMES | ACHIEVEMENT TO DATE |
|---|---|---|---|---|---|---|
| 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.<br><br>Decreased extraneous matter in cane supply.<br><br>Improved understanding of management practices influencing CCS. | Extend findings from the project to the local industry.<br><br>Identify parameters for further investigation.<br><br>Demonstrate impact of maturity at harvest.<br><br>Demonstrate on-farm practices and planning to improve CCS at harvest. | Investigate identified parameters.<br><br>Demonstrate maturity management within the farming system. | Improvement in yield and CCS due to a greater proportion of cane being harvested mature.<br><br>Decrease in extraneous matter in cane supply.<br><br>Adoption of management strategies that improve CCS. | Identification of an initial eight on-farm practices likely impacting upon CCS.<br><br>Dissemination of a series of information sheets discussing identified on-farm practices impacting upon CCS.<br><br>Several demonstrations and meetings to extend findings from the project.<br><br>Development of tools to support findings, including a crop suckering estimator. |

| INVESTMENT RATIONALE | ACTIVITY/ PROJECT | OUTPUT/ SOLUTION | SHORT-TERM OUTCOMES | MEDIUM-TERM OUTCOMES | LONG-TERM OUTCOMES | ACHIEVEMENT TO DATE |
|---|---|---|---|---|---|---|
| *Continued…* | Improve understanding of ripener efficacy, crop parameters and management opportunities. | Development of parameters for profitable application of ripeners. | Extend information to growers on parameters for profitable applications on ripeners based on field trial results. | Investigate new methodologies to measure moisture in cane.<br><br>Growers responsibly using ripeners when moisture in cane is within the identified profitable range based on crop measurements. | Growers are measuring crops to track maturity and using ripeners where necessary. | Seventeen trials were harvested across 2022 and 2023.<br><br>These trials have indicated that the profitable ripener application range is between 71%-75% moisture in cane. |
| | Support the development of a brix/moisture/maturity calibration for microNIR. | In-field tool for rapid measurement of crop maturity. | Development of initial calibration. | In-field testing and updates of maturity calibration. | Using MicroNIR to support crop maturity measurements, ripening and harvest decisions. | Preliminary calibration developed in 2023. |

### 6.4 Increased clean seed distribution and variety adoption

Investments in this priority will seek to 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 leading to adoption of best practice
- 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

Activities will be delivered in collaboration with local stakeholders and other collaborators yet to be confirmed.

| INVESTMENT RATIONALE | ACTIVITY/ PROJECT | OUTPUT/ SOLUTION | SHORT-TERM OUTCOMES | MEDIUM-TERM OUTCOMES | LONG-TERM OUTCOMES | ACHIEVEMENT TO DATE |
|---|---|---|---|---|---|---|
| Increased clean seed and new variety adoption are critical in improving productivity.<br><br>Improved clean seed distribution systems can significantly improve the levels of RSD and Pachymetra root rot infection in a district. | Clean seed plot review and roadmap development for improved systems. | Improved clean seed distribution systems in the Far North. | Review clean seed distribution systems in Mulgrave, Tableland and Mossman.<br><br>Identify variety mix to propagate in clean seed plots to improve productivity. | Establish additional distribution plots across the district and investigate alternative distribution methods. | Sufficient quantities of clean seed, and the right variety mix, to service the Far North.<br><br>Reduced impact on productivity from RSD and Pachymetra root rot. | Workshop held with IBCPS Board in January 2022.<br><br>Upgraded roadmap developed by SRA in consultation with IBCPS and adopted.<br><br>IBCPS has reviewed and updated variety mix with SRA Northern Variety Development Manager. |
| | Variety management and new variety adoption through additional data collection and demonstration. | Additional information for new varieties to support adoption. | Support existing demonstration plots.<br><br>Support extension activities for the variety development program. | 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.<br><br>SRA32 tissue culture purchased and |

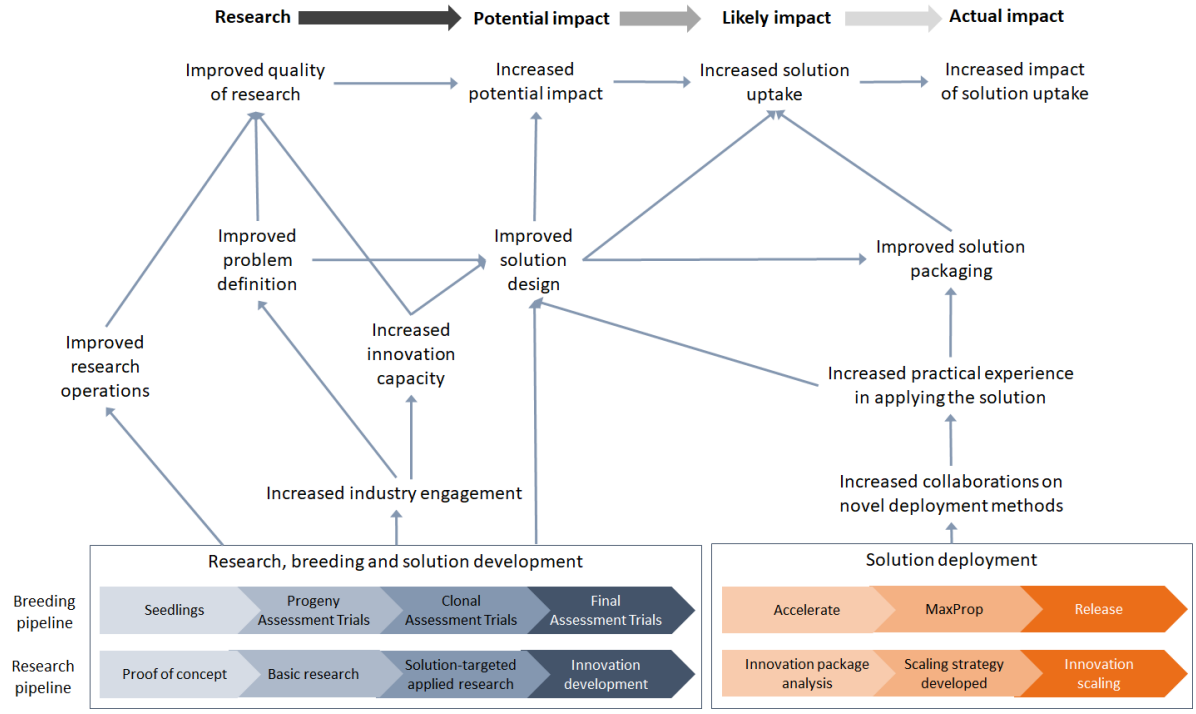
| INVESTMENT RATIONALE | ACTIVITY/ PROJECT | OUTPUT/ SOLUTION | SHORT-TERM OUTCOMES | MEDIUM-TERM OUTCOMES | LONG-TERM OUTCOMES | ACHIEVEMENT TO DATE |
|---|---|---|---|---|---|---|
| *Continued…* | | | | | | delivered to productivity services to reduce release window by one year.<br><br>Mobile mill delivered to support CCS curve development on the Tableland. |

# 7 Monitoring, evaluation and economics (MEE)

Guided by an Impact Framework, best practice MEE will assist in informed decision making, driving learnings and improvements, enabling SRA to demonstrate the value provided from investments to industry and investment partners.

Using this model, indicators will be commonly applied and focussed on outcomes, from District Productivity Plans to Research Investment Plans, through to Strategic Plans. Monitoring, evaluation and economics serve different functions. MEEprovides accountability, demonstrates worthiness andmerit of an investment or action, identifies improvements, and informs decision-making to deliver greater value from investments.

It is focused on delivery to impact and the following Outcomes Map has been developed to show how the different investments and activities contribute to achieving the endpoints of productivity, profitability and sustainability, and progress towards these points. It is aimed towards the end desired outcomes as shown by the top line charting from 'Research' to 'Potential Impact', to 'Likely Impact' and to 'Actual Impact'.




The district productivity plans will be updated every six months with progress reports, and reviewed annually to then determine the next plan, track progress and measured impact.

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