



Sugar Research  
Australia

# **SUGAR RESEARCH AUSTRALIA DISTRICT PRODUCTIVITY PLAN – CENTRAL DISTRICT**

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## Brief Introduction

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

These plans highlight the 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.

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## 1 Australian Sugar Industry Productivity Goal

The strategic intent for the Australian sugar industry is to; utilise the current area under cane to increase productivity by 10%. This 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) with each additional tonne of cane produced having a net revenue impact for growers, millers and harvesters.

## 2 Central District Overview

Sugarcane is grown in the Central district on approximately 103,940 hectares. Sugarcane is crushed through Plane Creek, Racecourse, Marian, Farleigh and Proserpine Mills in the region (Mackay Sugar and Wilmar).

During 2021, harvesting finished in Mackay and Plane Creek in December. The later harvesting timeframe increases the risk of standover which can result in reduced profit for growers. When a sugarcane crop is harvested late, with the intention to ratoon for another year, the result can be reduced yield in the following year. In a cyclone prone area like the Central District standover has the risk of deteriorating over the second wet season resulting in a crop with low CCS which may be at risk of being condemned. Mackay growers experienced this in 2016 and to a less extent in 2017.

The mills consistently respond to grower feedback with engagement through shed meetings where concerns are raised, and the timing of crush is determined together between the manufacturer and growers. Mackay Area Productivity Services operates a farm as the main seed cane sales site and propagation site for other billet distribution plots are spaced across the region.

## 3 Productivity constraints

SRA has conducted extensive stakeholder engagement over the past ten months to determine the constraints impacting the district. Recent issues raised include consistent supply of bins and mill reliability. Other issues that continue to be of concern for growers in the region include – soldier fly and access to crop protection.

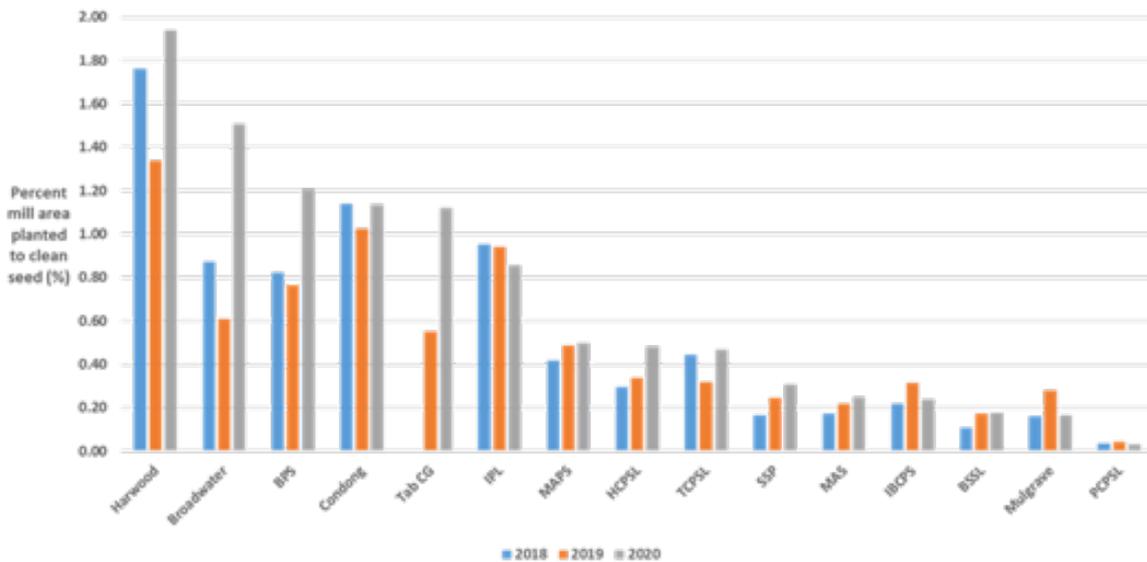
A focus for the area over the coming years is clean seed distribution with access to plots early in the season and billet sales targeted for improvement.

## 4 Productivity data

CENTRAL DISTRICT	2017	2018	2019	2020
<b>T Cane harvested</b>	7,579,396	7,376,813	7,747,262	7,921,554
<b>Ha Harvested</b>	106,184	107,999	106,464	103,940
<b>T cane/ Ha</b>	71.4	68.3	72.8	76.2
<b>Average CCS</b>	13.39 (Mackay standover)	14.29	14.14	14.18
<b>Average yield 2013-2020 T cane harvested</b>	7,990,000			

PRODUCTIVITY SNAPSHOT	2020/21		
<b>District – CENTRAL DISTRICT</b>			
T Cane harvested	8,260,000		
Ha harvested	106,147		
Rolling 5 year average t/ha	75		
7 year average T cane / ha	7,990,000		
Average CCS	14.20		
Varieties Top 5 Total Tonnes / %	<b>Plane Creek</b> Q208=30.9% Q183=30.0% Q240=15.9% Q242=4.8% Q138= 4/5%	<b>Mackay Sugar</b> Q208=30.2% Q240=26.1% Q183=15.7% SP80-1816=7.5% Q242=5.1%	<b>Proserpine</b> Q240=30.1% Q208=24.8% Q183=22.7% Q232=6.4% Q242=4.4%
Varieties – additional information	The three varieties Q240, Q208 and Q183 make up 77.6% of the region		
# mills	Wilmar and Mackay Sugar		

Clean seed uptake



## 5 Central District productivity goal

The Central District contribution to Australia's targeted increase volume of cane to 34 million tonnes under current area by 2026, will require an increase from 72t/ha to 80t/ha on a rolling average by 2026.

The priorities for the Central District are to; increase district productivity through focusing on improved variety adoption, increased irrigation utilisation, enhanced industry knowledge and impact through adoption of good farm practice by addressing soil health/pest/disease constraints that include Ratoon Stunting Disease (RSD), pests and yellow canopy syndrome.

The increase in productivity is aimed to counteract the loss of production due to land going out of cane production. The following projects are examples of SRA's commitment to working towards this goal.

### 5.1 Projects underway

Cane to Creek Mackay Whitsunday aims to build knowledge of farming practices and the effects on the quality of water leaving the paddock and farm productivity. Growers can use this knowledge to select farming practices that are beneficial for both the environment and farm production. The objective of the Cane to Creek project is to influence cane farming practices through communication of results from grower-led demonstration sites located in the Pioneer and Plane Creek catchments. Three demonstration sites were established in the first year of this project with water samplers, flumes, and rain gauges. Samples were collected for each farming practice that is assessed at the trial sites. Examples of learnings from year one demonstration sites include the importance of the correct placement of liquid Imidacloprid, and chemical properties of herbicide active ingredients (KOC and solubility values) are critical if applying at late-season where heavy rainfall events may occur, i.e. select the least-mobile chemicals. This work will be extended in Years 2 and 3 at different demonstration sites across the region.

### 5.2 Projects upcoming

SRA Central District has completed grant applications for:

- the Future Drought Fund to collaborate with Canegrowers to extend a current irrigation scheduling and efficiency improvement program to further growers (application unsuccessful).
- the Future Drought Fund to collaborate with Think Water Whitsundays and productivity boards to expand the usage of technology in irrigation operation and scheduling to growers.
- the Smart Farms soil health grants to provide soil constraint diagnosis and management recommendations to growers, with the intention to develop a soil health trigger action response plan to improve growers understanding and response to soil test results.

SRA Central District has the following key activities in the region:

- Irrigation efficiency audits following internal training from USQ.
- On farm improvement demonstrations will commence following discussions with groups of growers at shed meetings to identify potential motivated candidates.
- Crop ripener trial for prior to and early in 2022 harvest to improve CCS in cane delivered to the mill early in the season and better understand under what circumstances the application of ripeners offers a benefit.
- Collection of sticky trap data to support the work on YCS.
- A training program with productivity officers and SRA translation researchers has begun and will continue through the first half of 2022. This program is in response to the needs raised for the Mackay area through the productivity board and mill.

## 6 District Priorities

PRIORITY	OBJECTIVES
Improved variety adoption	<p><b>Improve adoption through greater information available on varieties to industry and promotion of benefits to increased impact</b></p> <ul style="list-style-type: none"> <li>• Adoption of clean seed and tissue culture and increase to 0.6% planted area to clean seed</li> <li>• Adoption of new varieties and maintain adoption of tissue culture to approximately 10,000 seedlings p.a.</li> <li>• Information available to growers through QCaneSelect/Variety Guide with information captured of variety performance on different production environments</li> </ul>
Improve irrigation utilisation	<p><b>Improve irrigation utilisation in the district through improved efficiency and knowledge of profitability benefits</b></p> <ul style="list-style-type: none"> <li>• 22% increase in utilisation</li> <li>• Increased CaneCalcs database scale</li> </ul>
Enhance industry knowledge and adoption of good farm practice through addressing pest/disease constraints	<p><b>Improve farming practice adopted in the district including use/timing of crop inputs</b></p> <ul style="list-style-type: none"> <li>• Increased industry knowledge through training opportunities, measured through attendance at training</li> <li>• Increased planting of fallow crop</li> <li>• Increased utilisation of crop ripeners</li> </ul> <p><b>Improve the understanding of the impact and management of pests and diseases</b></p> <ul style="list-style-type: none"> <li>• Use and timing of crop inputs and increased adoption of good farm practice</li> <li>• Reduced prevalence of RSD through improved farm hygiene</li> <li>• Improved knowledge of canegrub management and solider fly</li> <li>• Increased understanding of impact and control methods for yellow canopy syndrome</li> <li>• Reducing cane land loss through supporting next generation grower groups</li> </ul>

### 6.1 District stakeholder analysis

Snapshot of the growers in the region based on t/ha and mills, grower organisations and productivity companies as some of the industry stakeholders that SRA works with to improve productivity for the region. Stakeholder engagement and input to the priorities includes; CANEGROWERS, productivity boards, Wilmar and Mackay Sugar.

Stakeholder type	Proserpine	Mackay	Plane Creek	Total Area
X Large growers – over 50,000 T cane	1 (1,092ha)	6 (6,166ha)	2 (3,315ha)	9 (10,573ha) <b>9%</b>
Large grower – over 20,000T cane	15 (6,497ha)	43 (13,156ha)	5 (2,143ha)	63 (21,796ha) <b>20%</b>
Medium grower – between 8,000T cane – 20,000T cane	44 (8,407ha)	181 (26,069ha)	40 (8,800ha)	265 (43,276ha) <b>39%</b>
Other growers < 8,000T	110 (8,447ha)	398 (20,281ha)	103 (6,844ha)	611 (35,572ha) <b>32%</b>
Milling companies	Wilmar	Mackay Sugar	Wilmar	<b>Total Area</b> 111,217ha
Grower representative organisations	Canegrowers Proserpine (Majority)	Canegrowers Mackay/Plane Creek (Majority)	Canegrowers Mackay/Plane Creek (Majority)	<b>Total Growers</b> 948
	ACFA, AgForce, Independent (Minority)	ACFA, AgForce, Independent (Minority)	ACFA, AgForce, Independent (Minority)	
Productivity companies	Sugar Services Proserpine (SSP)	Mackay Area Productivity Service (MAPS)	Plane Creek Productivity Services Limited (PCPSL)	<b>Average Farm Size</b> 117ha
Regional variety committees	Central district regional variety committee			

## 7 Recent stakeholder engagement events

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 are some planned engagement events, to be delivered through SRA and are provided as examples to demonstrate the service model. A few of these may have started and most are yet to be scheduled. SRA continues to work to effectively bridge the gap between research and practice to improve district productivity.

	DELIVERED THROUGH SRA
<b>Education/Training</b>	Address good farming practice adoption through training productivity officers and interested growers and including change management. Supporting and establishing young and emerging grower groups in the district to set the next generation up for success in the industry.
<b>Marketing and promotion of new varieties in region</b>	Adoption of new varieties Collecting information on new varieties to aid in decision making and ultimately assist adoption: filling in the gaps on QCaneSelect.
<b>Assist growers with on farm trials</b>	Irrigation management – improving utilisation through efficiency, scheduling and demonstrating benefits. Establish understanding of the different species of soldier fly, distribution across region and variety tolerances in pot trials. Assist yellow canopy syndrome research through conducting targeted surveys and trap placement and monitoring.
<b>Investigate and promote complementary income streams for industry</b>	Breaking down the barriers of complementary fallow cropping to improve profitability.

## 8 Events scheduled

- Demonstrations, training programs/ workshops, trials, development of tools etc

Month	Events (as at the 8.4.2022)
January	<ul style="list-style-type: none"> <li>• Mackay Canegrowers Annual General Meeting</li> </ul>
February	<ul style="list-style-type: none"> <li>• SRA/Mackay Young Growers Group - launch event</li> <li>• Shed meetings</li> <li>• District fallow crop survey</li> </ul>
March	<ul style="list-style-type: none"> <li>• MAPS/PCPSL/SSP Shed meetings</li> <li>• Mackay Sugar Harvest Contractor Forum</li> <li>• Woodford Disease workshop – productivity officers* rescheduled due to flooding</li> <li>• Nutrient Management workshop/training – growers, prod officers, resellers</li> </ul>
April	<ul style="list-style-type: none"> <li>• Agronomy in practice training – productivity officers</li> <li>• Weed management training – productivity officers</li> <li>• SRA Ripener trials – application</li> <li>• Break out group shed meetings</li> <li>• 19 to 22 April ASSCT in Mackay</li> <li>• 26 April SRA Board meeting in Mackay</li> </ul>
May	<ul style="list-style-type: none"> <li>• SRA / MAPS Field Day</li> <li>• Ag trade Expo</li> <li>• SRA Mackay Station – FAT Trial Planting evening</li> </ul>
June	<ul style="list-style-type: none"> <li>• Proserpine Precision Ag Field Day</li> <li>• Mackay Ag Show</li> <li>• Pioneer Valley Show</li> <li>• Proserpine Show</li> <li>• SRA Ripener trials – harvesting</li> </ul>
July	<ul style="list-style-type: none"> <li>• Sarina Show</li> </ul>
September	<ul style="list-style-type: none"> <li>• SRA Mackay station – seedling selection day</li> </ul>

## 9 Implementation Strategy and Actions

The following table presents the key questions and resulting challenges; corresponding strategic targets which are ranked in priority order and actions' list to address these priorities

### 9.1 Improved Varieties Adoption

This priority will improve adoption through greater information available on varieties to industry and promotion of benefits. This will be achieved working in collaboration with growers and prod boards.

Targeted Practices Details of required action	How will we do it <i>Measurement of the issue; Education and knowledge transfer; Planning, Industry engagement, New practices; Product; or Service</i>	Activities/Projects	Targeted Output	Which MEE outcomes are most relevant?	Investment Outcome	Investment measures
Increased adoption of clean seed on farms	Education and knowledge transfer - Growers knowledge of variety information increased through education and knowledge transfer at shed meetings etc	1. Conduct observations on plots with Prod Boards, provide maturity testing of crops leading up to and during early stage of harvest to improve decision making. (Nov 21- Sept 22)	- Database of observations on varieties in observation plots - Additional data on QCaneSelect and Variety guide to show observations in district - Promotional tool showing varietal resistances (pachymetra) - Access to clean seed billets early in year	Increased practical experience in applying the solution	- Increased clean seed sales - Increased awareness of varieties and understanding of benefits - Reduced disease prevalence with increased clean seed distributed - Improved data collection of clean seed distribution 1 year from plots to understand utilisation of clean seed across the industry.	Increased number of farms accessing clean seed  30,000t  Regular adoption of clean seed (~70% of growers) gives 6t/ha improvement over frequent adoption,  Central District = 100,000ha, estimated 5% adoption
		2. Establish observation plots to facilitate statistical review, targeting soils types, chlorotic streak, commercial scale data. (2023 – 2025)	- Communicate observations and share Variety Guide at shed meetings - Create variety promotion for Shed meetings/ ag shows/field days	Increased solution uptake		
		3. Establish variety adoption promotion for shed meetings/field days/agricultural shows. (Nov 21 – Mar 22)	- Access to clean seed billets for those not close to distribution plots - Improved data collection of clean seed distribution 1 year from plots to understand utilisation of clean seed across the industry	Improved solution packaging		
		4. Utilise SRA cane harvester during Autumn planting window to cut clean seed from plots - pending availability and weather. (Apr 22 – Jun 22)				
		5. Establish clean seed billet delivery program using road registered transport. (2022 – 2024)				
	6. Establish methodology for Chlorotic Streak screening of new varieties. Glasshouse supplies, lab consumables for growing cultures and analysing samples with qPCR. (2022 – 2027)		Research, breeding and solution development			
	Research					

### 9.2 Irrigation utilisation

This priority will improve irrigation utilisation in the district through improved efficiency and knowledge of profitability benefits. It will achieve this in collaboration with growers. Prod boards, Canegrowers and water boards.

Targeted Practices Details of required action	How will we do it <i>- Measurement of the issue; Education and knowledge transfer; Planning, Industry engagement, New practices; Product; or Service</i>	Activities/Projects	Targeted Output	Which MEE outcomes are most relevant?	Investment Outcome	Investment measures
- Increased utilisation of irrigation - Improve irrigation utilisation in the district through improved efficiency and knowledge of profitability benefits	Education and knowledge transfer	1. Upskill SRA staff to complete irrigation efficiency audits. (Nov 21 – Jan 22)	- Irrigation efficiency audits - Publish case studies	Increased solution uptake	- Increased irrigation utilisation - Improved grower knowledge of irrigation economics	Measurement of system efficiency  Growers knowledge of irrigation economics Increased irrigation utilisation 25,276t  ~7-10t/ML, Eton 58,970ML Util:40%, PV 47,390ML Util:17%, Proserpine 38,076ML Util:45%, estimated 2.5% adoption
		2. Conduct irrigation efficiency audits and provide full farm irrigation management review. Requires pressure and flow monitoring equipment. (Dec 21 onward)				
		3. Develop and promote case studies following efficiency audits/reviews for different irrigation situations - source, method, amount available. (Nov 21-Mar22)				
	Measurement of the issue	4. Collaborate with Mackay Canegrowers on Future Drought Fund application for irrigation project - crop modelling, scheduling, soil characterisation. (Project approval pending)	- Database of measurements on irrigation systems for benchmarking	Improved problem definition	- Improved database of benchmark data - Increased utilisation of irrigation scheduling tools through Future Drought Fund project	
		5. Collaborate with USQ to improve grower irrigation benchmarking database on CaneCalcs website. (Dec 21 – onward)				
	Education and knowledge transfer	6. Establish irrigation management promotion for shed meetings/field days/agricultural shows. (Nov 21-Mar22)	- Create irrigation promotion for Shed meetings/ ag shows/field days	Improved solution packaging		

### 9.3 Adoption of good farming practice

Investments in this priority will improve farming practice adopted in the district including use/timing of crop inputs. This will be achieved in collaboration with growers and prod boards.

Targeted Practices Details of required action	How will we do it - Measurement of the issue; Education and knowledge transfer; Planning, Industry engagement, New practices; Product; or Service	Activities/Projects	Targeted Output	Which MEE outcomes are most relevant?	Investment Outcome	Investment measures
Increased adoption of good farm practice	Education and knowledge transfer	<ol style="list-style-type: none"> <li>1. Develop accredited training program for advisors and growers - case study based: nutrient management, soil health, irrigation, change management/adoption, weed/pest/disease management. Map outcomes to BMP. (Dec 21 onward)</li> <li>2. Establish complimentary demonstration sites for each of the accredited training modules. (Dec 21 onward)</li> <li>3. Collaborate with growers through prod board relationships/shed meetings/Young Grower groups to establish demonstrations on farms - small group learning, addressing local constraints (work into above point). (Mar 22 onward)</li> </ol>	<ul style="list-style-type: none"> <li>- Develop training programs and complimentary demonstration sites</li> <li>- Develop localised small group demonstration sites</li> </ul>	Increased solution uptake	<ul style="list-style-type: none"> <li>- Increased industry knowledge of good farm practice</li> <li>- Localised learning through small groups using demonstration sites</li> <li>- Improve early CCS through use of ripeners</li> <li>- Improve industry understanding of soil moisture effects of fallow crops</li> <li>- Improve industry uptake of fallow crops</li> </ul> Demonstrate industry leadership through BMP adoption and educate growers on SRA undertakings	Improved adoption of good farm practice  Increased fallow crop adoption  Measurement of productivity in demonstrations  Growers knowledge of importance of crop inputs and timing.  Prod officers knowledge of good farm practice for extension to growers.  18,750t  Average yields ~75t/ha, individual constraints offer yield reduction of over 10%, Central District = 100,000ha, estimated 2.5% adoption
	Product	<ol style="list-style-type: none"> <li>4. Develop decision support tools for use of ripeners to increase CCS during early harvests. May22 – Aug 24)</li> </ol>	<ul style="list-style-type: none"> <li>- Develop decision support tool for ripeners</li> </ul>	Improved solution packaging		
	Education and knowledge transfer	<ol style="list-style-type: none"> <li>5. Collaborate with prod boards to improve industry understanding of fallow crops on soil moisture available for planting cane. (Dec 21 onward)</li> <li>6. Submit application for soil health extension project to Smart Farms Soils grant. (Project approval pending)</li> <li>7. Establish good farm practice promotion for shed meetings/field days/agricultural shows. (Nov 21 – Mar 22)</li> </ol>	<ul style="list-style-type: none"> <li>- Assist prod boards in monitoring of soil moisture following fallow crops</li> <li>- Create good farm practice promotion for Shed meetings/ ag shows/field day</li> </ul>	Increased solution uptake		
	Service	<ol style="list-style-type: none"> <li>8. Utilise SRA farm machinery to offer fallow crop contract planting - pending availability and weather. (Nov 22 – onward)</li> </ol>	<ul style="list-style-type: none"> <li>- Create contract fallow crop planting business</li> </ul>	Increased collaborations on novel deployment methods		
	Education and knowledge transfer	<ol style="list-style-type: none"> <li>9. Lead by example and erect signage along SRA farms to demonstrate BMP and explain what is happening in each paddock. (Feb 22)</li> <li>10. Establish listing of fallow crop contractors, costs and contract size to promote further investment in contract equipment and increase complimentary fallow crop uptake. (Dec 21)</li> </ol>	<ul style="list-style-type: none"> <li>- Erect signage at farms – BMP, info etc.</li> <li>- Develop list of fallow crop contractors.</li> </ul>	Increased solution uptake		
	Service	<ol style="list-style-type: none"> <li>11. Offer spray water quality testing at SRA station. (Dec 21 onward)</li> </ol>	<ul style="list-style-type: none"> <li>- Offer spray water quality testing</li> </ul>	Increased collaborations on novel deployment methods		

### 9.4 Address Cane Land Loss

Investments in this priority will promote the economic value of the industry to growers and future growers to reduce the loss of cane land. This will be achieved through collaboration with growers, prod boards and canegrowers.

Targeted Practices Details of required action	How will we do it <i>- Measurement of the issue; Education and knowledge transfer; Planning, Industry engagement, New practices; Product; or Service</i>	Activities/Projects	Targeted Output	Which MEE outcomes are most relevant?	Investment outcomes	Investment measures
Reduced loss of cane land	Education and knowledge transfer  - Grower knowledge of economics of cane farming. - Grower knowledge of complimentary fallow crops.	1. All promotions to include economics where possible to demonstrate industry profitability. Make considerations in promotional material to be inclusive of those with work off farm: promoting value of contractors, different management practices, costings. (Nov 21 onward) 2. Establish complimentary fallow crop promotion for shed meetings/field days/agricultural shows. (Dec 21 onward)	- Develop promotions that include economics - Create complimentary fallow crop promotion for Shed meetings/ ag shows/field days	Increased solution uptake	- Reduced rate of cane land loss. - Increased understanding of industry economics and profitability. - Increased understanding of complimentary fallow crops. - Increased participation from new farmers and younger generation and targeted improvement of their knowledge. - Increased awareness of ag-tech.	3,750  1% p.a Central District losses - 1,000ha p.a, estimated 5% adoption
	Industry engagement	3. Represent sugar industry on community committees to improve community perceptions: Mackay Regional Council Sustainability and Environment Advisory Committee, Healthy Rivers to Reef Partnership (May 21 onward) 4. Establish Mackay/Plane Creek Young Growers Group and support Proserpine Young Growers Group to promote the industry to the next generation and support them with entering and succeeding in the industry. (Jan 22 onward)	- Participate in industry committees - Establish young grower group for Mackay - Support Proserpine young grower group	Increased industry engagement		
	Education and knowledge transfer	5. Promote ag-tech through field day to improve efficiencies and advance the industry technologically to make it more appealing for investment. (Jun 22 onward) 6. Promote grower cost of production knowledge through training courses and spreadsheets. (Dec 21 onward) 7. Partner with millers to promote training programs to newcomers to the industry. (Dec 21 onward) 8. Develop packs of SRA reference material to provide to new farm owners/lessee. (Mar 22 onward)	- Host ag-tech field day. - Develop training programs and complimentary demonstration sites  - Develop introductory packs for new farm owner/lease - Supporting initiatives from the industry roadmap.	Increased solution uptake  Increased collaboration on novel deployment methods		

### 9.5 RSD

Investments in this priority will reduce the prevalence of RSD in the district through farm hygiene. This will be achieved in collaboration with growers, prod boards and Canegrowers.

Targeted Practices Details of required action	How will we do it <i>- Measurement of the issue; Education and knowledge transfer; Planning, Industry engagement, New practices; Product; or Service</i>	Activities/Projects	Targeted Output	Which MEE outcomes are most relevant?	Investment outcomes	Investment measures
Reduced infection of RSD in district	Education and knowledge transfer  - Grower knowledge of the impacts of RSD and management.	1. Facilitate regional RSD workshop - sampling issues, current projects, field detection, revised Integrated Disease Management. (Nov 21 – Dec 21) 2. Establish RSD management promotion for shed meetings/field days/agricultural shows. (Dec 21 onward)	- Facilitate workshop/shed meetings. - Create RSD promotion for Shed meetings/ ag shows/field days	Increased solution uptake	- Increased grower knowledge of RSD.	Reduced incidence of RSD in the district  10,500t  currently >20% RSD infection in Proserpine for recent SSP survey and ~1% in Mackay. Minimum 35% impact to yield giving >105,000t loss. Estimated 10 years to eliminate.
	Research	3. Research Project - RSD Detection in Mills (Dec 21 onward) 4. Research Project 2020/002 - On-farm Detection of Sugarcane Diseases (Dec 21 onward) 5. Proposed project - On board sterilisation harvester demonstration (Dec 21 onward)	- Participate in research projects where applicable.	Research, breeding and solution development	- Increased industry involvement in research projects where applicable	

### 9.6 Pests

Investments in this priority are aiming to:

- Improve grower knowledge of can grub management as imidacloprid continues to be observed in water quality monitoring, risking products future for cane grub management.
- Improve industry knowledge of soldier fly.

These results will be achieved in collaboration with growers and prod boards.

Targeted Practices Details of required action	How will we do it <i>- Measurement of the issue; Education and knowledge transfer; Planning, Industry engagement, New practices; Product; or Service</i>	Activities/Projects	Targeted Output	Which MEE outcomes are most relevant?	Investment outcomes	Investment measures
Reduced impact to productivity due to pests.	Measurement of the issue  - Grower knowledge of the impacts of pests and management. - Measurement of the impact of soldier fly. - Researcher knowledge of soldier fly.	<ol style="list-style-type: none"> <li>1. Research Project 2020/802 - Mackay Whitsunday Cane to Creek - promote findings from work done to improve imidacloprid stewardship (Dec 21 onward)</li> <li>2. Research Project 2020/004 - Beyond Imidacloprid (Jan 23 onward)</li> <li>3. Establish understanding of the different species of soldier fly, distribution across region and variety tolerances in pot trials. (Dec 21 onward)</li> <li>4. Provide product advice training to agricultural resellers and contractors based on regulation compliance and research findings. Particularly around industry stewardship with imidacloprid usage and N/P budgets. (Dec 21 onward)</li> </ol>	<ul style="list-style-type: none"> <li>- Promote findings from the project at Shed meetings/ ag shows/field days</li> <li>- Participate in research projects where applicable. Potentially once research is at the stage of field scale trials</li> <li>- Develop training programs</li> </ul>	Improved problem definition	- Increased industry knowledge of pests and management.	Reduced productivity impact due to pests.  1,267t  cane grub management, currently impacting ~10,000t. Soldier fly impacts ~4000t, bigger risk is loss of land to cane following infestations. Estimated 10 and 15 years to eliminate.

### 9.7 YCS

Investments in this priority will improve the understanding of the impact of YCS and how to control. This will be achieved in collaboration with growers and prod boards.

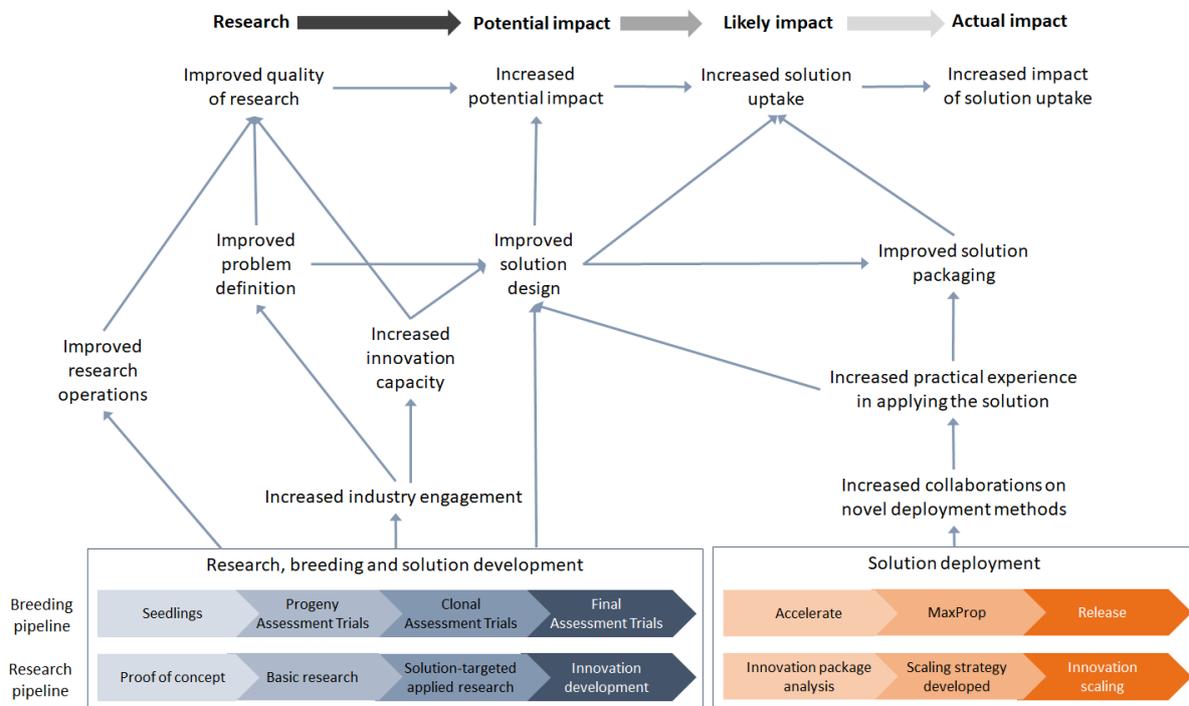
Targeted Practices Details of required action	How will we do it <i>Measurement of the issue; Education and knowledge transfer; Planning, Industry engagement, New practices; Product; or Service</i>	Activities/Projects	Targeted Output	Which MEE outcomes are most relevant?	Investment outcomes	Investment measures
Improved knowledge of the impact of YCS and contributing factors.  (Nov 21 onward)	Measurement of the issue  - Researcher knowledge of YCS.  Product	<ol style="list-style-type: none"> <li>1. Assist Hang Xu by conducting targeted surveys and trap placement - for pest distribution, YCS incidence and varietal damage.</li> <li>2. Provide growers and productivity boards with YCS test kits, training and compile data collected. (\$10/kit x100)</li> </ol>	<ul style="list-style-type: none"> <li>- Participate in research projects where applicable.</li> <li>- Provide YCS test kits to industry.</li> </ul>	Improved problem definition  Improved solution packaging	- Increased industry knowledge of YCS incidence and contributing factors.	Increased knowledge of YCS incidence.  Currently impacting CCS of dryland farmers predominantly, no data has been collected locally to understand yield impact

## 10 Monitoring, Evaluation and Economics (MEE)

The intention with impact framework is that best practice MEE informs decision making and drives learning and improvement and enables SRA to demonstrate the value provided from investments to industry and its investment partners.

Cascading through from district productivity plans to the research investment plans and linking to the strategic plan, indicators will be commonly applied and focused on outcomes. Monitoring, evaluation and economics serves different functions and provides accountability, demonstrates worthiness or merit 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 on the end desired outcomes as shown by the top line charting from 'Research' to 'Potential Impact' to 'Likely Impact' to Actual Impact.



The district productivity plans will be updated regularly with progress reports and the plans will be reviewed annually to then determine the next plan, track progress and measure impact.



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