Sugar Research Australia

Cane Matters

Spring 2025

CONTENTS

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Sugar Research Australia Limited acknowledges and thanks its funding providers, including levy payers (sugarcane growers and millers), the Commonwealth Government, and the Queensland Government (Department of Primary Industries).

(Cover page) SRA Entomology Leader Dr Kevin Powell at a canegrub trial site in the Burdekin.

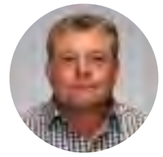
Editorial contributions by Sonia Campbell (Editor), Christine Walker, Alisa Cork and Mike Ebner. Design by Eli Lin.

Acknowledgements: *SRA acknowledges and thanks its investors, including levy payers (sugarcane growers and millers), the Commonwealth Government and the Queensland Government.*

Queensland Government

Australian Government
Department of Agriculture, Fisheries and Forestry

A MESSAGE *from* **CEO, Mick Bartlett**



In recent weeks I had the pleasure of joining SRA's Board of Directors in the Burdekin for the September Board meeting. The meeting offered the opportunity for the Board, growers and milling representatives to get together to discuss industry issues and opportunities.

The discussions were frank, constructive and positive and were a timely reminder of the need for industry cohesion in driving the sugar industry forward.

A big thankyou to Talbot Cox for hosting the Board on his farm and providing valuable insights into the benefits of adopting technological innovations and alternative farming systems.

The Board and I are confident in the stability of our organisation and our ability to continue delivering outcomes with impact for industry.

I want to reassure our members and partners that SRA is in a stable financial position. We have recently undertaken a review of organisational expenditure and have made changes that will increase efficacy, efficiency and promote long term financial sustainability.

This is not just about keeping the lights on, it's about ensuring we have the resources and people in place to accelerate solutions for growers and millers into the future.

SRA is embarking on developing the organisation's next 5-year strategic plan. This will be based on creating greater focus on addressing known and emerging issues whilst exploiting identified opportunities. It's about outcomes not output. Identifying these key objectives and outcomes will only be successful with industry input.

Looking ahead, you can expect to see more targeted projects moving quickly from trial to adoption, and more collaboration with industry partners. SRA is focused on building momentum, and I'm optimistic about the opportunities that lie ahead for both productivity and sustainability.

I would like to encourage all stakeholders to exercise their right to vote at the AGM in November. Membership is free to all levy payers.

Mick Bartlett
Chief Executive Officer

SRA'S AGM

SRA's 2025 Annual General Meeting (AGM) will be held on 25 November.

The AGM is an opportunity for members to participate, ask questions and vote on new Board of Directors' positions. This year's AGM will see the appointment of two non-executive directors.

When: 11:00am (AEST) Tues 25 November 2025

Where: The AGM will again be held as a 'hybrid' meeting, which means members will be able to attend in person at The Atrium (UQ), 308 Queen St in Brisbane, or virtually through an online platform.

Voting before the AGM

If you are an SRA member or member representative, you will receive voting forms prior to the AGM. All SRA members are eligible and encouraged to vote.

Please note, your completed voting form must be received at least 48 hours prior to the AGM. Any voting form received after that time will be invalid.

You can lodge your completed voting form by either email, post or in person at the following addresses:

Email: members@sugarresearch.com.au

Mail: Sugar Research Australia Limited
Attention: Membership
GPO Box 133, Brisbane QLD 4001

Or in person:
Sugar Research Australia Limited
Level 10, 300 Queen Street
Brisbane QLD 4000

BECOME A MEMBER OF SRA – IT'S FREE!

As a cane grower, you're already investing in research through your levy. You can maximise its value through your membership – it's your right as a levy payer and offers you:

- **A voice in your industry** – vote in Board elections and help shape SRA's direction
- **Access to research and resources** – the latest insights direct from researchers, tools, and best practices to improve on farm productivity and profitability
- **Priority opportunities** – involvement in trials, projects, and workshops tailored to grower needs
- **Direct support** – from district staff who work with you to turn research into on-farm results.

Joining is simple – for more information, visit sugarresearch.com.au/join

SEARCH FOR ALTERNATIVES TO IMIDACLOPRID FOR CANEGRUB CONTROL ACCELERATED

Twelve trial sites have been identified and are currently being established across Queensland to begin a high-priority project to accelerate the search for alternatives to imidacloprid for effective canegrub management.

The sites, located on commercial cane farms in Central, Southern, Burdekin, North and Far North growing districts, will be used to assess the efficacy of a number of potential ag chemical solutions, in-field.

It follows a special out-of-session Board decision earlier this year to invest beyond SRA's core pest programs.

SRA's Lead Entomologist, Dr Kevin Powell, has had extensive discussions with all relevant chemical companies to negotiate collaborative research partnerships, to progress trials for treatment application this season.

These trials and the data collected will support applications for product registration by the respective chemical companies.

CEO Mick Bartlett said the initiative reflects the urgent need for sustainable and effective solutions to canegrub, which continues to cause major economic losses across the Australian sugarcane industry.

"This is an extremely high priority for SRA, and one we are taking very seriously," Mr Bartlett said.

"The Board has endorsed our lead entomologist, Dr Kevin Powell, to proceed with field trials in Phase Two of his research, which focuses on identifying and testing viable alternatives to imidacloprid as part of an integrated pest management solution.

"We know we need to shift the dial. That's why the Board and management have chosen to fast-track this program, backed by strong governance and targeted investment."

The program builds on years of foundational work by Dr Powell and his entomology team and will run in parallel with SRA's broader pest management portfolio, which includes improving application practices and sharing best-practice advice through productivity services and industry networks.

"We are deeply aware of the impact canegrubs are having on the crop right now," Mr Bartlett said. "Growers have every right to expect answers and leadership, and that's exactly what we are delivering. Our District Managers have already been holding workshops in key regions to provide immediate advice on available control methods and ensure good application practices are being followed."

Mr Bartlett stressed that while a replacement product will not be available immediately, SRA has committed clear timelines and strong governance to deliver progress.

"We hear growers loud and clear – they need assurance and progress, and they need to know SRA is on top of this. We are backing our people and our science to deliver."

Dr Powell said treatment applications at trial sites would commence in October, and he remained confident the field trials would validate encouraging laboratory findings.

"Efficacy trials conducted in the laboratory by SRA have shown a number of alternatives to be highly promising," Dr Powell said. "We now need to see how effective they are under field conditions."

"Preliminary data from the first field trials is expected to be available by the middle of 2026."

SRA will continue to keep growers and millers informed as the program advances. For information about trials in your district, SRA members and cane levy payers are encouraged to contact their district managers.

Further meetings will be held to inform the industry about progress, and updates will be published in SRA's Cane Matters Monthly emails. If you have not subscribed to SRA communications, please do so using the QR code.

Key Message

- Research on potential alternatives to imidacloprid has moved from the lab to the field, with trial sites now established in key regions.
- SRA has committed clear timelines to deliver progress in this priority area.
- Regional workshops have been held to provide immediate advice on currently available imidacloprid-based control methods and to ensure effective application practices are followed.

Project 2025-001 - Beyond imidacloprid – Ensuring effective and sustainable canegrub control for the future is funded by Sugar Research Australia (SRA).

THANK YOU GROWERS

SRA would like to sincerely thank and express our appreciation to growers who have volunteered to host trial sites as part of this project, allowing this important work to be carried out.

"Without the valuable assistance of growers, this work would not be happening," SRA Lead Entomologist, Dr Kevin Powell, acknowledged. "So, our thanks go out to all the growers who have provided suitable trial sites for this work to be conducted.

SRA Entomology Leader Dr Kevin Powell (left) with Entomology Research Scientist Dr Samuel Bawa at a canegrub trial site in the Burdekin.

SRA project team – Entomologist Dr Emtia Chandrima and Entomology Research Scientist Dr Samuel Bawa at one of the canegrub trial sites in the Mackay region.

SRA District Manager Burdekin, Terry Granshaw (pictured below left) with Lead Entomologist, Dr Kevin Powell, during a visit to a Burdekin trial site.

PROJECT GAINS MOMENTUM IN **RSD DETECTION IN THE MILL**

An SRA research project is progressing technology which may allow the quantification of Ratoon Stunting Disease (RSD) in every rake of cane that enters a mill.

If successful, it could revolutionise industry's understanding of the true distribution of this bacterial disease, which has been difficult to diagnose due the lack of visible symptoms.

The current project, which started in 2022, is developing near infrared (NIR)-based detection of RSD in every rake processed through the mill. This involves collecting both NIR data, and molecular confirmation of the RSD pathogen, and then the development of NIR calibrations that are validated by the molecular data.

"Previously our NIR algorithms could only indicate whether mill juice was positive or negative for the presence of RSD, which had limited scope, as there was no ability to calibrate for the potential severity of RSD within a milling area," Project Leader, SRA Lead Field Pathologist, Dr Seona Casonato explained.

SRA Lead Field Pathologist, Dr Seona Casonato (pictured in a greenhouse at SRA's Tully Station) is leading a promising research project that could dramatically improve industry's knowledge of the distribution of RSD across milling regions.

Project 2022/007 – Delivery of a pest and disease diagnostic step change for the sugarcane industry (RSD – NIR) is funded by Sugar Research Australia (SRA).

Pictured left: *An example of an NIR unit at a No.1 mill being used in a project aiming to quantify Ratoon Stunting Disease (RSD) in rakes of cane that enters a mill.*

Pictured right: *The Near Infrared (NIR) technology that could revolutionalise industry's understanding of the distribution of RSD across milling areas.*

Improvements introduced in 2024 (the use of quantitative polymerase chain reaction (qPCR) to determine levels of the RSD pathogen in mill juice) mean that future calibrations will be based not just on the presence or absence of the RSD pathogen, but instead the levels of the pathogen.

"Now, with new calibrations of the NIR, using the molecular data that we have collected so far, we are able to give better accuracy in the detection of RSD in mill juice," Dr Casonato said.

"This data gives us a more accurate determination of RSD in each rake of sugarcane within a milling region."

Last season, molecular data was collected from four milling areas: South Johnstone, Tully, Bundaberg and Isis. While this data will need to be scrutinised further, preliminary results from all four mills, in the rakes tested, indicated RSD detection rates between 20%-30%.

Importantly, molecular quantification was done on every rake at the Tully Mill due to a substantial collection effort by Tully Cane Productivity Services Ltd (TCPSL) with all molecular qPCR being undertaken at SRA laboratories.

TCPSL manager, Peter Sutherland, indicated preliminary data suggested yield loss was not solely attributable to RSD infection alone. A preliminary result that did not surprise Dr Casonato.

"RSD on its own can affect yield, however, other factors, such as not controlling weeds, having other diseases in the crop, having poor soil or plant nutrition, or other stresses impacting the plant can compound the effects on yield," she said.

Dr Casonato was confident in the results from the project so far, indicating: "If this technique proves to have a good correlation with qPCR results, this will be used as part of a tool kit to determine the impacts of RSD within a milling area".

BENEFITS TO INDUSTRY

- Mills that adopt this technology will be able to provide an accurate and cost-effective assessment of RSD levels and commercial crop distribution of RSD across the entire mill area. This will provide a much greater understanding of the true incidence of this disease across the industry.
- It is hoped that growers' knowledge of RSD levels on their farms will promote greater uptake of recommended management guidelines and better management of this disease.
- Information on disease rates will help growers decide whether to replant or ratoon for the following season. It is important to note that increased adoption of the recommended management guidelines is critical for effective long-term control of the disease.
- Over the long term, there is opportunity for annual commercial crop surveys across all mill areas nationally, which could then be used for benchmarking methods and improve management of the disease.

STEPS TO MANAGE RSD

As highlighted on Pages 6 & 7, Ratoon Stunting Disease (RSD) is a highly infectious disease which causes stunting and considerable yield losses. However, there are various ways it can be effectively managed.

STEP 1:
Fallow management

Fallow periods, in particular volunteer free fallows, help to break pest and disease cycles.

For managing RSD, it is critical to ensure the fallow is free of volunteer cane to eliminate the disease from the block prior to planting.

STEP 2:
Acquiring clean seed material

It is essential that approved seed is planted into fallow ground with no volunteers.

Approved seed includes obtaining material from your local productivity services provider, from approved clean seed plots, or by purchasing tissue culture.

STEP 3:
Machinery and equipment hygiene

Any equipment which may interact with planting material can spread RSD from an infected source. Therefore, cane knives, harvesters, plant cutters, planters (whole stick and billet) and stool splitters should all be sterilised prior to entering either a clean cane crop from an infected crop or from farm to farm.

Keeping machinery clean – Pictured: Key sterilisation points for RSD on harvesters indicated in Blue.

STEP 4:
Make use of SRA's RSD diagnostics service

If you are planning on sampling your cane crop, contact your local productivity service provider who in most districts will organise a plant source inspection and include a separate RSD test.

District Productivity Services can sample both xylem and leaf sheath bioassay (LSB) samples and know how to avoid or limit contamination. The samples are sent to SRA's IRIS laboratories in Brisbane.

SRA provides an affordable RSD service to assist the industry to obtain clean planting material. Samples are triple tested, and every aspect is optimised to avoid human error, including the use of robots.

Pictured (above): The effect of RSD on cane yield. The image shows a diseased crop (left-side of the photo) compared with a healthy crop (right-side)

ROCKY POINT GROWERS WORKING TO REDUCE RSD

With SRA support, Associate Professor Anthony Young from The University of Queensland (UQ) and his team are working with Rocky Point growers to improve RSD control.

Chair of Rocky Point CANEGROWERS, Greg Zipf said growers had welcomed the opportunity.

"We've made up some leaf sheath (LSB) sampling toolkits so growers are not only able to sample their seedbeds, but also make calls on commercial crops. This way we can reduce the amount of RSD out there and improve management," Mr Zipf said.

A broader extension effort has been supported by SRA and Rocky Point CANEGROWERS. This aims to inform growers about practical things they can do to prevent the spread of RSD, starting with clean seed planted into fallow. Already there are indications of success with less infection reported in seedbeds this year.

"Our growers are getting on the front foot to combat RSD," Mr Zipf said.

This project is funded by SRA through a Service Agreement with CANEGROWERS Rocky Point.

For more information about controlling RSD visit the SRA website.

LOW-COST SENSOR SYSTEM MEASURES BILLET LENGTHS IN REAL TIME

Identifying issues that reduce profitability for mills, growers and harvesting contractors was the aim of a joint SRA-Sunshine Sugar co-funded project undertaken at Condong and Tully Mills.

Researchers, Electrical and Electronic Engineering Graduate, Barton Wixted, and Research Fellow, Rudi Bartels, from Griffith University, sought to address the problem of measuring the quality of intake cane at the mill.

The project successfully demonstrated the viability of a low-cost off-the-shelf measurement system using robust sensors installed at sugar mills to record billet length in real time. Despite teething and development issues, the system performed well at both Condong and Tully mills.

Sunshine Sugar's first prototype of the system was tested in 2020, with Barton Wixted researching the possibility of using artificial intelligence and computer vision to measure the billet lengths of intake cane continuously, 24 hours a day.

"There is a basic management principle across industries from accounting to engineering and quality management – you can't manage what you can't measure. In this case, it is not possible to manage billet lengths without measuring and knowing their actual lengths," said Mr Bartels.

"However, attempts to do this manually at the mills are prohibitively expensive in terms of labour and time.

"The automation of the process will now provide information to empower mills, harvesters and growers to set target billet lengths for optimal returns to the industry."

Billet length has been shortened over the years in order to load and unload them more easily for conveying to the mill. They also increase the load density and weight carried per bin to reduce transport costs for haul-outs and the mill.

"However, there are trade-offs in terms of quality."

"Using the data collected by the system, milling productivity and the financial implications of billet length can now be determined."

The project findings were presented at the Regional Sugar Milling Research Seminars in late March-April. A paper was also presented at this year's ASSCT conference.

Manufacturers, Sunshine Sugar, Tully Sugar, Wilmar Sugar and Isis Sugar, were consulted regarding billet length and billet quality assessments of supply cane.

The mills agreed on the relationship between billet length and overall supply cane quality but each mill's individual financial circumstances played a heavy factor in their assessments of the prospects of measuring and managing billet length.

The relationship between billet length and packing density was a significant consideration for mills relying on rail transport. However, for road transport, axle load limits and associated total weight limits mean the packing density is not as important.

Funded under a SRA Small Milling Research Fund grant, the final project report is available on the SRA website.

Researchers thanked Sunshine Sugar milling staff for their assistance in time and resources, including Kent Selby and Phil Scroop; Tully milling staff for their assistance with trials; and QUT Associate Professors, Geoff Kent and Simon Denman, for assisting with the measurement data at the trials at Tully Mill.

Key Benefits

- Low-cost off-the-shelf tech, computer vision and AI, recorded billet length in real-time at Condong and Tully Mills
- This automation will empower mills, harvesters and growers to set billet lengths targets for optimal returns to the industry
- Using the data collected by the system, milling productivity can now be weighed up against financial implications of decisions on billet length.

Barton Wixted presents the results of the project at the Regional Sugar Milling Research Seminar held at Condong in March.

POT TRIALS IDENTIFY EFFECTIVE **PRE-EMERGENT HERBICIDE TREATMENTS OF ITCH GRASS**

Four pot trials led by SRA Weed Science Leader, Emilie Fillols, have identified effective pre-emergent control strategies for managing itch grass.

The replicated trials were conducted in a greenhouse at SRA's Meringa Station from March 2024 (seed collection) to June 2025.

For the trials, itch grass seeds were collected from different locations between Proserpine and Cairns. Soil for the experiments was collected from topsoil at the Meringa Research Station, classed as Mission and red loam.

Monitoring and data collection

Trials were monitored every three to four days, for four to seven weeks. The following assessments were carried out:

- Plant counts in each tray: germinated seeds, alive and dead seedlings
- Final biomass measurement of aerial and underground plant material: dry biomass.

WHAT THE RESULTS MEAN FOR GROWERS

Table below summarises pre-emergent herbicides and herbicide mixtures that were highly effective in preventing itch grass establishment. Refer to the product label to understand the conditions of use and prevent crop damage.

Diuron, mixed with hexazinone, is the only pre-emergent herbicide in sugarcane that includes itch grass on its label.

Itch grass ***(Rottboellia cochinchinensis)*** is one of the many weeds that can be found in cane fields from Central Queensland to the Far North, particularly in the Burdekin and Cairns regions.

It has been identified as one of the 12 worst weeds of sugarcane by the Global Invasive Species Database (2020). Due to its large size, it will compete with crops for light, water and nutrients.

Active ingredient	Commercial name	Efficacy
diuron, hexazinone	4kg/ha Barrage	100%
imazapic, hexazinone	0.63kg/ha Bobcat® i-MAXX	100%
isoxaflutole + hexazinone	0.1kg/ha Balance® + 2kg/ha AC Tressel	100%
imazapic + amicarbazone	0.2kg/ha Spark® + 1kg/ha Amitron®	100%
isoxaflutole + amicarbazone	0.2kg/ha Balance® + 1kg/ha Amitron®	100%
isoxaflutole + diuron	0.2kg/ha Balance® + 0.5kg/ha Diuron 900WG	99%
flumioxazin	0.7kg/ha Valor®	99%
imazapic + isoxaflutole.	0.2kg/ha Spark® + 0.1kg/ha Balance®	98%

Pot trial 1

More than 1000 seeds were planted in trays in a randomised complete block design with four replicates. Twenty seeds per tray were sprayed with pre-emergent treatments. This initial trial screened most of the pre-emergent herbicides registered in sugarcane at their full label rate.

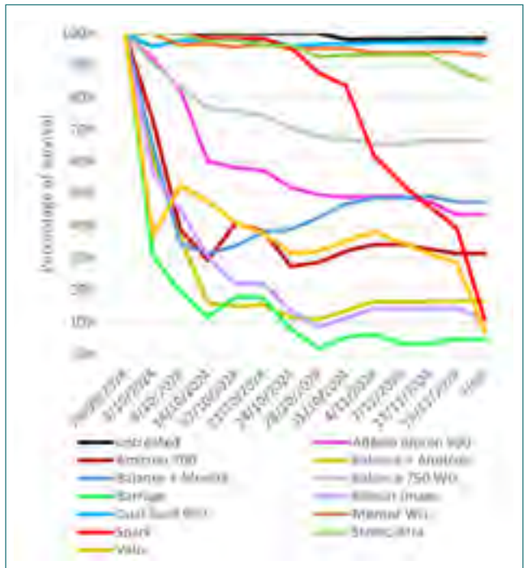
Several treatments resulted in death of the emerged seedlings.

- The most effective treatment was the premixed diuron + hexazinone (Barrage) which killed 95% of the itch grass seedllings followed by the premixed imazapic + hexazinone (Bobcat® i-maxx) and isoxaflutole (Balance®) + amicarbazone (Amitron®) where only 15-16% of seedlings survived.

Pictured: The effect of Bobcat® i-maxx (bottom tray) and Mentor® (top tray) on itch grass germination and growth 6 weeks after planting and spraying in trial 1.

Effect on plant biomass

Two months after spraying, several treatments were highly efficient and reduced itch grass biomass (the stems, leaves and roots) by more than 97.5%.
These were: diuron + hexazinone (Barrage); isoxaflutole (Balance®) + amicarbazone (Amitron®); flumioxazin (Valor®); imazapic + hexazinone (Bobcat® i-maxx); and imazapic (Spark®).



Graph 1: *Pot Trial 1 percentage of survival rate of seedings for each pre-emergent herbicide treatments.*

Pictured: Mature itch grass in fallow.

Pot trial 2

Trials 2, 3 and 4 were randomised complete block designs with 18 replicates. Five seeds were planted in smaller sized pots.

Trial 2 combined the best treatments from Trial 1 to generate better efficacy. It also explored the option of reducing the rates of the most effective treatments.

Several treatment combinations not already tested in Trial 1 were highly efficient and resulted in 100% mortality of itch grass seedlings. Of particular note: isoxaflutole ½ rate (Balance® 750 at 100g/ha) + hexazinone (AC Tressel 250 SL at 2L/ha) and imazapic ½ rate (Spark® 240 at 200 ml/ha) + amicarbazone (Amitron® 700 at 1kg/ha).

Some treatments reduced seedling survival to below 5% Isoxaflutole (Balance® 750 at 200g/ha) + diuron (Diuron 900 at 500g/ha); and flumioxazin (Valor® 500 at 700 g/ha).

The seedling mortality from most treatments, but especially Bobcat® i-MAXX and Valor®, was higher in Trial 2 than in Trial 1, likely related to the establishment season. Trial 2 was established in the fast-growing summer season which would have accelerated plant growth and herbicide uptake.

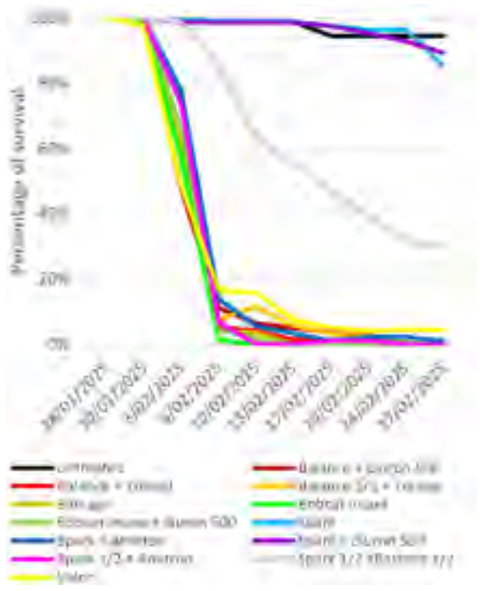
The lower mortality with imazapic (Spark®) in Trial 2 compared to Trial 1 is likely due to the shorter duration of Trial 2 (one month instead of two months) and the slow mode of action of imazapic.

Effect on plant biomass

Several treatments not already tested in Trial 1 reduced more than 99% of the produced biomass. These were: isoxaflutole ½ rate (Balance® 750 at 100g/ha) + hexazinone (AC Tressel 250 SL at 2L/ha), imazapic ½ rate (Spark® 240 at 200 ml/ha) + amicarbazone (Amitron® 700 at 1kg/ha) and isoxaflutole (Balance® 750 at 200g/ha) + diuron (Diuron 900 at 500g/ha).

Imazapic ½ rate (Spark® 240 at 200 ml/ha) + isoxaflutole ½ rate (Balance® 750 at 100g/ha) reduced 98% of the produced biomass.

Pictured: The effect of different herbicides on itch grass germination and growth 2 weeks after planting and spraying – Trial 2.



***Graph 2:** Pot Trial 2, percentage of survival rate of seedings for each pre-emergent herbicide treatments*

Pot trial 3

Two treatments – pendimethalin (Stomp®Xtra 455 at 3.3 L/ha) and trifluralin (Treflan® 480 at 3 L/ha) were tested separately in Trial 3 to accommodate a high watering regime, that would suit their high soil binding property (High Koc*). Both treatments did not result in acceptable seedling mortality results. The most effective treatment was the trifluralin, which resulted in 49% itch grass seedling survival. Pendimethalin was the least effective with more than 91% seedling survival.

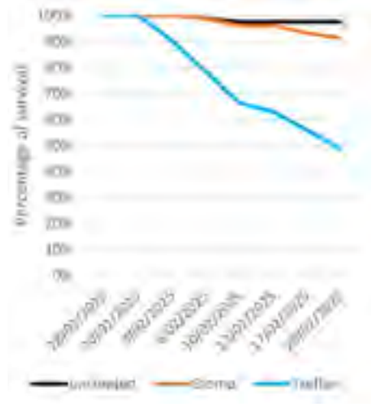
Effect on plant biomass

Trifluralin (Treflan®) reduced 96.5% of the amount of produced biomass, compared with the untreated biomass. Pendimethalin (Stomp Xtra®) reduced only 47.5% biomass, compared with the untreated biomass.

Results obtained with pendimethalin align with previous findings from Australia published by Benson in 1984, who observed 50% itch grass control using pendimethalin in field trials.

Itch grass seeds used in the first three pot trials were from the Burdekin region where itch grass has been an issue for decades and Stomp®Xtra has traditionally been used for its control.

**KOC stands for Organic Carbon-Water Partition Coefficient, which is a measure of the herbicides ability to bind to organic matter in soil or sediment, compared to its solubility in water. The higher the KOC indicates that it's more likely to remain in the soil, rather than be carried off via runoff.*



***Graph 3:** Pot Trial 3, percentage of survival rate of seedings for each pre-emergent herbicide treatments*

Pot trial 4

Trial 4 compared only one treatment – pendimethalin (Stomp®Xtra) - against five itch grass populations from the Tablelands, Wet Tropics, Burdekin and Proserpine. It was established to explore the possibility that some itch grass populations are more or less susceptible to pendimethalin.

In the trial, Stomp®Xtra significantly decreased seedling survival in the Proserpine population (70% survival), but not for the other populations.

Stomp did not result in acceptable mortality results for any of the populations.

Effect on plant biomass

Stomp®Xtra significantly reduced the biomass for each population compared to the untreated, however these losses are not sufficient to consider Stomp efficient to control any of the tested itch grass populations.

***Graph 4:** Pot Trial 4, percentage of survival rate of seedings for each population when treated with Stomp®*

New Itch Grass Fact Sheet available
Download here

Benson AJ (1984) Chemical control of itch grass (Rottboellia exaltata) in cane fields in the Burdekin district. BSES Queensland, Australia. Project 209.01.006, 23pp.

Fillols E (2026) Pre-emergent control of different accessions of itch grass with pendimethalin. ASSCT proceedings (in review).

Fillols E (2026) Pre-emergent herbicides screening for itch grass control in sugarcane. ASSCT proceedings (in review).

MicroNIR OFFERS RAPID DECISION-MAKING FOR CROP MATURITY MANAGEMENT

Far Northern field trials using hand-held MicroNIR units to measure crop maturity have assisted growers in the region to make decisions on growth regulator applications and general harvest scheduling.

The trials began in March of this year and have been conducted on more than 100 demonstration blocks in Mulgrave, Babinda, Mossman and the Atherton Tablelands.

They follow 2022 trial work carried out as part of the Mulgrave CCS Improvement Project which showed that in select circumstances sugarcane growth regulators containing trinexapacethyl (i.e. Moddus®, AC Grappa 250, and others) have a greater likelihood of profit when crop moisture content is between 71-75% at application.

Former Sugar Research Australia (SRA) District Manager Far North, Gavin Rodman, who co-ordinated the work, said the demonstration sites aimed to validate that applications, at this moisture range, maximised profits for crops that were unlikely to be naturally mature at the time of harvest.

"Over the past three years, our field trials on growth regulators have been driven by a goal of increasing the proportion of cane being harvested at optimum maturity," Mr Rodman said.

"In our initial trials, we found that a crop moisture range of 71-75% roughly equates to a brix range of 16.0% to 19.5%. Application of growth regulators at these ranges – between six and 10 weeks prior to harvest – showed a greater likelihood of profit."

In the 2022 trial work, brix measurements were taken by extracting juice from whole stalks at a small mill.

In 2025, handheld micro Near InfraRed (NIR) devices have been used to collect brix measurements in the field, starting with initial calibrations to demonstrate the applicability of managing crop maturity, either through using available products or harvest scheduling.

Former SRA District Manager Mulgrave Gavin Rodman using a hand-held MicroNIR to take moisture measurements as part of a cane maturity project conducted on Tableland grower Jason Salvetti's farm.

Real-time decision making

The MicroNIR offers growers a real-time, on the go tool to make decisions in the field.

"Alongside SRA's NIR team, we started building the cane maturity calibration in March 2024, however, we had already missed some of the really immature samples that year due to the crop progressing a bit quicker than we had anticipated," Mr Rodman said.

"To enable a well-rounded model that encompasses a broad maturity range, 2025 sampling began in January.

"One thing that was always important to us was to find a robust method that was rapid in the field. If sampling was going to require similar time to cutting and using a small mill, then there was little to be gained. This meant that our goal was to also identify a method that would require two to three scans of a stalk to gain a good representation."

To develop this robust and rapid methodology the brix of every internode of more than 100 stalks were measured with thousands of accompanying scans. A dibbler and a refractometer were used to measure the brix, and each internode was also scanned with the MicroNIR several times. Once each internode had been measured, a stalk average brix was measured using the small mill and the digital refractometer.

"This data collection process enabled the development of the rapid method we were seeking. It was identified that only two seven-second scans with the MicroNIR were required, one on the third internode from the top of the stalk and the other from the third from the bottom," Mr Rodman said.

Notable observations

Mr Rodman said the MicroNIR demonstrations had offered some interesting findings when comparing brix averages from different cane varieties.

"In some cases, while the averages of different varieties were the same, the brix range between the top and bottom of the stalks, from variety to variety, were quite different," he said.

"For instance, when we tested KQ228$^{(t)}$ and SRA32, they both had a very similar average, around that 71-72 per cent. But the difference in range between the bottom and top of the KQ228$^{(t)}$ stalk was much larger than what we saw with SRA32. Obviously the KQ228$^{(t)}$ is a higher sugar variety to the SRA32, so we believe it dried down a lot quicker and the measurements we took supported this."

Trial data will continue to be collected for the remainder of the season.

Tableland cane grower Jason Salvetti took part in demonstrations of the MicroNIR on-farm and found the real-time decision-making tool easy to use and beneficial to his CCS.

MicroNIR ADOPTION REAPS REAL REWARDS

Tableland cane grower Jason Salvetti took part in demonstrating the MicroNIR technology on-farm to see if there were advantages to applying growth regulators to his plant cane early in the season, to try and increase his CCS.

Mr Salvetti is one of 25 growers who have taken part in the 2024/25 demonstrations across the Far North, and is pleased with the results.

"I found it really easy to use (the MicroNIR). I got results back, in the paddock. And the results we've had with improving our CCS, I believe it is worth it," Mr Salvetti said.

"Early on in the season, I can definitely see the benefits of using the MicroNIR.

"In one block, which happen to be early cut ratoons, we decided not to apply a growth regulator because the MicroNIR told us that stalk moisture was low, meaning it would mature without the need of Moddus. This block ended up having higher than mill average CCS. But in blocks that had higher moisture, meaning lower maturity, we applied Moddus, and we saw an increase in CCS in those paddocks.

"We think we've picked up anywhere between half a unit, to one and a half units depending on the variety. We'll have to do a little bit more work to verify that, but we definitely saw an increase in CCS in that first week of the season, harvesting plant cane."

Adopting the MicroNIR technology has also allowed Mr Salvetti to make other valuable observations in the paddock, including differences between varieties in their maturity rates.

"I assumed lower sugar varieties like SRA32 were just behind in maturity, but we found that SRA32 was actually more mature than KQ228$^{(t)}$. KQ228$^{(t)}$ had a much higher difference in moisture between the top and bottom of the stalk in comparison to SRA32."

These, and other insights, he said provided learnings that could be used to make informed decisions.

"I definitely would use the MicroNIR again. It's a very beneficial tool to assessing crop maturity."

Central District Delivery Officers Hayley Keats (standing) and Emma Burns have been conducting a crop ripener trial on the McClennan farm at Walkerston, using a handheld MicroNIR device to measure cane quality, including brix.

BOOSTING YIELD POTENTIAL: SRA40$^{\Phi}$ CROP RIPENER TRIALS

As part of the Central District Productivity Plan, a demonstration site has been established to quantify the effect of using a crop ripener for maximising CCS content in SRA40$^{\Phi}$, which was approved for release in the Central region in 2023.

This demonstration trial aims to provide another tool to help drive adoption and improve the commercial performance of SRA40$^{\Phi}$, which has shown great overall disease resistance, to major diseases found in the Central region.

SRA40$^{\Phi}$ has a tonnes of cane per hectare (TCH) yield advantage over Q208 of 9%, and a tonnes of sugar per hectare (TSH) advantage of 4% in SRA Final Assessment Trails (FATs). In these trials, variety performance is compared to a suite of commercial standards, which for the Central region are KQ228$^{\Phi}$, Q183, Q208, Q240$^{\Phi}$, Q253$^{\Phi}$ and SRA9$^{\Phi}$.

SRA40$^{\Phi}$ has shown to have a CCS that on average is 1.3 units less than the average CCS of the standard varieties. Current advice for growers is to consider planting on poorer soils or reduce the N applied to maximise CCS.

The trial began late last August, on a 7.6 hectare block on the McLennan farm at Walkerston near Mackay. The crop ripener was applied by drone at a water rate of 40 litres per hectare. Central District Delivery Officers, Hayley Keats and Emma Burns, divided the area into six fully randomised and replicated strips. Each strip was less than one hectare, allowing for commercial scale rake data to be collected from the mill once harvested. Ten representative stalks were selected from each strip, for non-destructive testing using the MicroNIR.

MicroNIR has to be calibrated by SRA NIR engineers to predict measurements of cane quality, including brix. Half of the stalks have been scanned weekly using standard procedures. The other half of the stalks have been scanned weekly at every internode to quantify the rate of sugar accumulation within internodes.

Data collection will continue up until harvest, after which analysis will be performed on the MicroNIR and mill data to calculate the economic benefit of crop ripeners on the performance of SRA40$^{\Phi}$.

Pictured (left and right): During trials, for each test fan speed, a sample was collected from the bins and sorted into billets, tops, trash and cane roots.

HARVEST MATE AUTO **BURNT CANE TRIALS**

SRA has been conducting burnt cane harvest trials in the Burdekin during the 2025 season as part of work on the Harvest Mate Auto Project.

The present version of Harvest Mate is setup for green cane harvest only. The 2025 burnt cane trials, plus data from previous burnt cane trials conducted between 2018 and 2024, will be statistically analysed and used to build models between harvester operating parameters (e.g. fan speed, ground speed and topper setting) and harvest performance (e.g. losses, CCS and bin weights).

These statistical models are data driven, in that the more data on which the model is built, the greater confidence is built in the output of the model. The harvester performance models embedded in Harvest Mate feed into financial models (in Harvest Mate) and allow users to investigate economic implications of changes in harvesting practices.

The 2025 burnt cane trials have involved several primary fan speeds – typically zero fan, moderate - 500 revolutions per minute (r/min) and high (800 r/min – 850 r/min). For the moderate setting, two treatments were conducted – with and without the secondary fan, depending on whether the harvester was fitted with a secondary fan.

Ground speed was selected by the harvester operator. For example: four treatments - 0 r/min, 650 r/min with secondary fan off, 650 r/min with secondary fan on, and 800 r/min with secondary fan on, replicated four times, giving a total of 16 individual tests. Each test had its own rake of bins, therefore 16 consignment notes would have been completed at the siding.

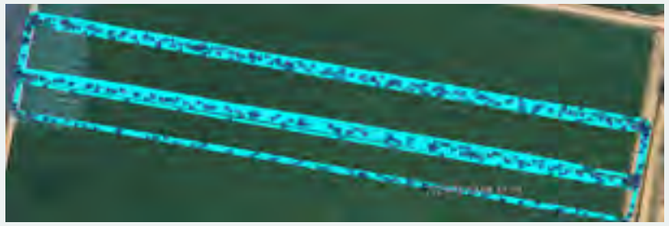
During the harvest trials, samples were collected from each rake. The samples were sorted into billets, tops, leaves and roots, so as to determine the amount of extraneous matter (EM) in the cane supply.

Bin weights were used to determine the mass of cane and EM in each rake, which allowed yields of each treatment to be calculated and compared. Similar comparisons were made to the CCS of the treatments, once the CCS rake data was provided by the grower.

The trials conducted to date (September 2025) have been in plant and ratoon cane, good and poor burn conditions, with wheeled and tracked machines.

The trials aim to produce data on the effect of the harvester cleaning system on cane loss and EM in the bin. This data will be used to build the models in the Harvest Mate web-based portal and app.

SRA's trial work will increase Harvest Mate's dataset to continue to build confidence in the program.



Example of recently completed trial:

- 3 treatments (fan speeds) x 4 replicates = 12 tests.
- Ground speed as typically used by harvester operator.
- Delay between tests minimal as change in fan speed easily done.
- Hand held GPS in the harvester cabin used to measure row length for each test.
- Each test harvested into 3 x 15 t transporters, then loaded into 9 x 5 t bins.
- Trial did not delay harvest operation.

SRA acknowledges the invaluable research contribution by economists from the Queensland Department of Primary Industries (DPI) for the development of this tool, as well as funding from DPI for its delivery.

Queensland Government

NEW VARIETIES FOR BURDEKIN, HERBERT AND SOUTHERN **APPROVED IN 2025**

Three new varieties found to have higher yields than standard varieties were approved for release by Regional Variety Committees (RVCs) in 2025: SRAW46Φ in the Burdekin and SRA48Φ in Herbert, while SRA47Φ has a provisional release status for Southern Region, subject to more disease data.

"Performance for these varieties is better than the most commonly grown standards for their respective regions by between 6-7% for tonnes cane per hectare (TCH) and 3-13% for tonnes sugar per hectare (TSH)," Variety Development General Manager Dr Garry Rosewarne said.

"Disease resistance profiles are generally sound, although SRA48Φ and SRA47Φ are respectively rated susceptible, and intermediate to susceptible, to Pachymetra.

"Further testing will be undertaken to confirm scores, however, growers should not plant these varieties on soils with high Pachymetra spore counts."

Pictured (below): SRAW46Φ

Wilmar Sugar Technical Field Officer Terry Morgan in a trial plot of SRAW46Φ at SRA's Brandon Station in the Burdekin.

SRAW46Φ – Burdekin

SRAW46Φ (QK14-2492) is from a cross made at SRA's Meringa crossing facilities and selected in early-stage trials by Wilmar's Technical Field Department.

The variety then advanced to combined SRA and Wilmar Final Assessment Trials (FATs) across multiple sites and harvested over three crop years.

In FATs, it has shown an increase in TCH with a decrease in CCS over the average performance of the four standard varieties (KQ228Φ, Q240Φ, Q183 and Q208).

"Q240Φ currently accounts for nearly 53% of production in the Burdekin, and SRAW46Φ showed a 7% increase in TCH and 6% increase in TSH compared with Q240Φ in FAT trials," Dr Rosewarne said.

Further performance data for SRAW46Φ will be collected during 2025 and 2026 when processing Burdekin Productivity Services' strip trials through commercial mills.

SRAW46Φ demonstrates resistance to smut and leaf scald, with a level of Pachymetra resistance comparable to the four standard varieties, in the Burdekin.

Wilmar Sugar Technical Field Officer Terry Morgan agreed the variety had shown some strong productivity traits.

"It's a vigorous grower, consistently, I've seen it at other sites like the Herbert, it's usually taller than a lot of other canes," Mr Morgan said. "It doesn't have a propensity to lodge, it stays reasonably upright, and it's not heavy with trash. The trash doesn't adhere tightly to it like KQ228Φ for example.

"We didn't see any arrowing issues here in the Burdekin, but in the Herbert it has tended to arrow regularly over the last couple of years. I wouldn't say it's a prolific arrower (in the Herbert), but I would put it mid-range."

For more information on SRAW46Φ, please contact BPS. The variety will be available for purchase from BPS in 2027.

Table 1: *Agronomic performance of SRAW46Φ. Field data was collected from 10 trials over three series that were all grown to second ratoon. Data presented is averaged over the three crops in the series*

BURDEKIN	SRAW46Φ	KQ228Φ	Q240Φ	Q183	Q208	%Q240Φ (53% crop)
TCH	136	130	127	121	131	107
CCS	16.6	17.2	16.7	17.1	16.9	100
TSH	22.5	22.3	21.2	20.8	22.1	106

Download SRA Burdekin Variety Guide 2025/2026

SRA48Φ – Herbert

SRA48Φ was approved for release at the 2025 Herbert RVC meeting and will be available as seed cane in 2026.

From limited trial results in the Herbert, SRA48Φ has shown a sugar yield advantage over Q200 (4%), Q208 (3%), Q232Φ (3%) and Q240Φ (4%).

Data was collected from two FAT series (2017 and 2019), from a combined total of six trials.

SRA48Φ has generally shown a slightly lower CCS than Q200, Q208 and Q240Φ, but a slightly higher CCS than that of Q232Φ.

It has demonstrated a cane yield advantage over Q200 (5%), Q208 (6%), and Q240Φ (6%) and is comparable to Q232Φ. This advantage has been consistent across most crop classes and trial locations representing Herbert's main soils and growing environments.

"SRA48Φ has a strong disease resistance profile against most of the Herbert's major diseases, including leaf scald resistance and smut resistance," Variety Development General Manager Garry Rosewarne said.

"Pachymetra was scored as intermediate-susceptible. This is higher than major commercial varieties grown in the Herbert and additional testing will be undertaken to confirm the Pachymetra rating. Growers should avoid planting this variety in areas with a high Pachymetra spore count.

"Limited observations from Herbert trials indicate that SRA48Φ has low arrowing and light suckering.

"SRA48Φ is a reliable germinator with an average stalk population and a medium barrel of light green colour. It has medium loose trash and a clean, erect canopy with narrow leaves. it also features an erect, compact stool with an upright growth habit, providing excellent harvesting presentation."

The variety will be available from 2027 through Herbert Cane Productivity Services Limited (HCPSL) approved seed cane plots (limited) and in 2026 as tissue culture.

SRA Variety Officer Herbert, Linda Di Maggio inspects a crop of SRA48Φ in a trial block at SRA's Ingham Station.

Table 2: *Agronomic performance of SRA48Φ. Field data was collected from six trials over two series, grown until second ratoon. Data presented is averaged over all crops in the two series.*

HERBERT	SRA48Φ	Q200	Q208	Q232Φ	Q240Φ	% Q208 (28% crop)
TCH	94	90	89	95	88	106
CCS	16.6	17.0	17.2	16.0	17.0	96
TSH	15.6	15.2	15.2	15.2	14.9	103

Download SRA Herbert Variety Guide 2025/2026

SRA47Φ – South

SRA47Φ was provisionally released for the southern region earlier this year. It shows high TCH and CCS in the data from seven trials over two series planted in 2019 and 2021 (Table 3).

"SRA47Φ shows a 7% increase in TCH and a 13% increase in TSH above Q240, the most common variety grown in the south (42% of crop)," Garry Rosewarne said.

"Fibre quality readings and quality results suggest no issues for milling.

"SRA47Φ is resistant to smut, Fiji leaf gall and mosaic, with intermediate resistance to leaf scald. It is susceptible to Pachymetra.

"The individual trial scores for Pachymetra were 9, 5 and 5, giving a weighted score of 6.6, meaning slightly susceptible.

"Additional testing will be undertaken to confirm the rating."

Table 3: *Agronomic performance of SRA47Φ. Field data was collected from seven trials over two series. One trial was grown to fourth ratoon. Data is averaged over all crops in the two series.*

SOUTH	SRA47Φ	KQ228Φ	Q240Φ	Q232Φ	Q208	% 240Φ (42% crop)
TCH	102	95	95	94	94	107
CCS	16.6	16.7	16.0	15.4	15.8	104
TSH	17.1	15.8	15.2	14.5	14.9	113

Pictured: Researchers involved in the project included: (right) QUT Associate Prof. Darryn Rackemann and (left) Research Engineer, Faculty of Engineering Hakan Bakir.

FINDING A WAY TO REDUCE SUCROSE LOSSES AND **CORROSION RATES IN SUGAR MILLS**

Australian sugar factories are facing the challenge of improving energy efficiency to futureproof their global competitiveness as the world transitions to a net zero economy.

Mill evaporator stations typically consist of between four to six stages, or 'effects' of juice boiling. The juice boils at a higher temperature at the front end of the evaporator set and is lowest at the back end of the set.

To achieve high levels of efficiency when using steam, one method is to use extensive vapour bleeding from various effects of the evaporator station.

That means bleeding off or diverting some of the vapour produced in one stage of an evaporator system from its usual path to be used for other tasks. These include heating cane juice during the clarification stage, preheating the juice feeding the evaporator set and supplying heat to the pans for sugar boiling.

By using this bled vapour for other heating purposes, the overall demand for fresh steam (from the boiler) is reduced, improving energy efficiency of the overall process while still achieving the desired evaporation.

However, additional equipment and careful control are needed to maintain the mill's overall performance. The juice is also exposed to higher temperatures at the front end of the evaporator set which increases the level of sucrose degradation. This is called sucrose inversion losses and is characterised by low juice pH which causes sucrose to hydrolyse into glucose and fructose.

The process also contributes to the formation of acidic condensates that cause premature failure of piping, valves and fittings through corrosion.

Both these sucrose losses and increased maintenance costs (because of corrosion) reduce the profitability of sugar production.

To correct this problem, Condong Mill installed and tested an ammonia dosing system during the 2024 crushing season. This is designed to minimise sucrose inversion losses as ammonia raises the pH of the juice and therefore increases the overall sugar yield.

The ammonia also vaporises out of the boiling juice and enters the condensate streams of the evaporator set, raising the pH of the condensates and therefore reducing corrosion.

A manually operated small dosing pump was operated at a range of set speeds in the tests.

Surprisingly, there were no significant ammonia odours using this dosing system near the evaporators and nearby areas. Due to the chemical reactions involved, no other environmental issues were observed or detected in the discharge of river cooling water systems. No ammonia was detected in samples of sugar collected for analysis during the ammonia dosing periods.

Condensates were collected for pH measurements. Samples of Evaporator Supply Juice (ESJ) and liquor were also collected for laboratory measurements of pH and Brix. High Performance Liquid Chromatography (HPLC) was used to separate the various substances to purify, identify and quantify them in the laboratory.

The pH/Brix measurements of the juice and liquor samples and other evaporator process data were used to calculate the predicted sucrose inversion losses across the evaporator set. These were found to be more significant in the first evaporator effects. Condong Mill has a six effect evaporator set.

The results showed minimal impact on the juice pH. Four selected sugar samples collected within one and 22 hours of the ammonia dosing did not detect any nitrogen above the lower detectable limit allowed.

Sucrose losses were found to be generally lower during ammonia dosing tests.

By contrast, there was significant impact on the condensate pH. Ammonia dosing raised the condensate pH by between 1.0 to 2.5 units which would reduce the corrosion maintenance costs.

For this project, the cost benefit analysis depends on assumed reductions in the corrosion maintenance budget and sucrose loss across the set.

Based on a 25% reduction in the corrosion maintenance budget and a 0.086% reduction in sucrose loss across the evaporator set from ammonia dosing, the financial benefits are strong for a typical sugar mill processing 500 t/h.

Whilst the results at Condong didn't quite meet the project's desired cost benefit analysis, particularly with regard to the reduction of sucrose loss, it is viewed that an extended trial needs to be done to better quantify the corrosion and sucrose loss benefits.

The researchers recommended additional projects to better assess the impact of condensate pH on corrosion rates.

They want to examine a mix of ammonia and an alternative alkali agent that isn't volatile like ammonia. They believe this will give greater benefits for the juice pH and further decrease sucrose loss across the set.

Key Benefits

- Improving energy efficiency in Australian sugar mills will bring benefits to the whole sugar industry
- One method in improving energy management uses extensive vapour bleeding from the evaporator station to divert the vapour for other heating tasks
- Researchers at Condong Mill have investigated a way to correct sucrose inversion losses and increased corrosion costs with potential benefits for most sugar factories .

The project 2024/201 Hybrid pH control strategies to reduce sucrose losses and control corrosion in sugar factory evaporators is a Small Milling Research Project funded by SRA and undertaken by QUT researchers and Sunshine Sugar staff. A copy of the final report can be read here.

Pictured: AgriTech Solutions Operations and Farmer Engagement Manager Cherrie Stockham worked with Andre Rapisarda to integrate automated irrigation systems on two of his family's Burdekin cane farms using the Farm In One interface to drive the innovative technology.

SMART IRRIGATION PROJECTS **OVERCOME CONNECTIVITY ISSUES**

Andre Rapisarda readily admits he initially had strong reservations about adopting automated irrigation practice change, but today he's a willing advocate.

The Clare cane grower's early reluctance wasn't because he didn't have faith in smart irrigation innovations, or had an aversion to change. He and his farming family have used soil moisture monitoring technology for many years in their horticultural cropping and have experienced problems with both hardware and communication disruptions.

Due to the location of their farming enterprise, mobile phone and internet reception are often poor and intermittent, meaning transitioning to any automated irrigation system would always have its challenges.

After some convincing from SRA's District Manager Burdekin Terry Granshaw, and with help and expertise from Cherrie Stockham from AgriTech Solutions, Andre and his father Sib signed up to participate in two automated irrigation projects. Both projects – the Lower Burdekin Smart Irrigation Project (LBSIP) and the Lower Burdekin Cane Major Grants Project – offered incentive funding to growers to adopt new and innovative irrigation practice change.

"I was definitely hesitant at the start when asked if we wanted to be involved. But because of the grants, we decided to jump at it," Andre said.

"And, you know, every project has its teething problems, and we've certainly had ours in these projects, but we're getting there. It's been good, and I'm glad we did it."

The Rapisardas worked with Mrs Stockham, Operations and Farmer Engagement Manager with AgriTech Solutions – a delivery partner in both projects – installing automated irrigation systems on two farms, one managed by Andre (135ha), the other managed by Sib (180ha).

"The idea was to test two different concepts and approaches to automation," Mrs Stockham explained.

"One (project) was front end pump and valve control with back-end feedback, at the end of the paddock. The other one was more simplified with end-of-row feedback turning off pumps but really trying to focus on reducing the amount of water running off to a recycle pit. And then quantifying the benefits of the two."

The projects incorporated a dual frequency radio network, automated valves, pump controllers, pressure sensors, and end of row sensors, all connected to a user-friendly platform called Farm In One – an interface that can be used with a mobile phone, tablet or computer; designed to help farmers remotely operate the technology and easily keep records.

However, one of the biggest hurdles that needed to be overcome was the interference from a large solar farm adjacent to both project sites.

"Because line-of-sight distances between the base station and the farms were well within the maximum range, the signal strength was expected to be strong and consistent," Mrs Stockham said.

"The initial signal strength testing confirmed this. When the intermittent issue was discovered, additional testing showed the interference was a problem between 8am and 2pm. The reflection generated by the solar panels distorted the automation system's radio signal resulting in intermittent communications.

"Rather than transmit the signal directly over the top of the solar farm, the solution was to triangulate around the solar farm, to ensure reliable transmission to and from the base station."

While there's been considerable trial and error along the way, Andre said converting to automatic irrigation systems had saved the family considerable time and money, including reductions in both water and electricity usage.

"There are multiple time savings as well," Andre said. "On one block, the pump would turn off automatically, then when you're on your way there the next morning you can remotely start it. As you are swapping over valves, the pressure is already building up, so by the time you've got the valves swapped you've got pressure and can check your cups. The time savings on not having to run around the farm, manually operating the pumps and valves to change sets, really do add up.

"And the farm with the end of row sensors, even with the recycle pit, the drills shut off way earlier than what they would have, if it was done manually. It's good that you can see that feedback and know when water reaches the end of the field.

"Another good thing with the recycle pit sensors, once the pump is on, you don't really have to worry about it. You just check your oil and water before you start, and you know your pump will shut off when the pit water level gets too low and it will automatically re-start when the pit reaches our user-defined depth."

"But we're lucky that we've had Cherrie with us, helping to learn the system and having the patience to get through the tedious parts. You couldn't do it without that support."

The LBSIP and the Lower Burdekin Cane Major Grants Project have both been completed, however the operational support offered to growers involved in both projects continues.

The Rapisardas – who also grow pumpkins and watermelons – are considering expanding automation on their farms, following their experience in both projects.

Key Benefits

- Cost savings – reduced power and water bills
- Time savings – automated irrigation saves hours on manual operation of pumps
- Farm In One – user-friendly interface helps growers to interact with the automation technology from the palm of their hand, as well as easily keep records

The XXXX Lower Burdekin Smart Irrigation Project (LBSIP) was funded through a partnership between the Great Barrier Reef Foundation and Lion Corporate. It was delivered as a complementary addition to the Lower Burdekin Water Quality Program, managed by NQ Dry Tropics.

The Lower Burdekin Water Quality Program (including the Lower Burdekin Cane Major Grants Project) was funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.

NEW SRA FUNDED SUGAR MILLING PROJECTS **FOR 2025/26**

SRA can announce two new projects approved for funding under the Small Milling Research Project (SMRP) investment scheme. The SMRP is an initiative that invests in lower cost, short-term, practical research projects focused on delivering tangible benefits to the milling sector.

Project 2025/201
Reducing factory exposure to lead fumes, dust, welding and cutting fumes

Chief Investigator: Geoff Kent Queensland University of Technology (QUT)

Project Rationale

The Sugar Mill Safety Code of Practice 2024 places greater emphasis on managing risks associated with lead fumes and dust from brass bearings, and welding and cutting fumes from roll arcing and general fabrication, as well as maintenance activities for the factory and cane railway track.

As a result, each milling company is required to reassess the controls they have in place to ensure they satisfy the requirements of the updated code.

There is an opportunity for all milling companies in this transition phase to the new code to collaborate and share information to enable them to determine the most appropriate approaches to control these risks, considering the full hierarchy of controls.

There is also an opportunity for the milling companies to collaborate to evaluate new products on the market that could form part of these controls.

Key objectives:

- To collect and share data to enable each milling company to determine the most appropriate approaches to control the risks from lead fumes and dust and welding and cutting fumes by reviewing approaches implemented by all eight Australian sugar milling companies.
- To evaluate implemented and proposed control measures, and to assist with improving these measures.

Risk assessments and associated control measures used by all eight Australian sugar milling companies for lead fumes and dust, and welding and cutting fumes will be reviewed, discussed and analysed.

Several new and trial products have been identified and will be evaluated as part of this project including;

- Lead-free bearing material developed by Bundaberg Walkers Engineering Ltd (BWEL) and first trialled at Millaquin Mill during the 2024 season.
- Portable Local Exhaust Ventilation Fume Extraction equipment to reduce fume levels when roll arcing
- Elimination of the need for roll arcing, by using cladding as an alternative to arcing, will be further explored. Tully Sugar and Mackay Sugar both use cladding on some of their mill rolls.

Outcomes and adoption

The project will deliver data and knowledge to assist each milling company to determine the most appropriate control measures to manage the risks of lead fumes and dust from brass bearings, and welding and cutting fumes from roll arcing and general fabrication and maintenance activities, for the factory and cane railway track.

Following the release of the project findings, each company is expected to review their control measures and assess whether the control measures discussed and evaluated in this project are suitable for adoption. Each site will have its own evaluation of the risk, and adoption is expected to follow if the existing risks are too high.

Roller at Pioneer Mill which will be roll arced during the maintenance period.

Key Benefits

- The benefits from this project are mainly social and environmental.
- Improved health and safety of sugar factory employees through reduced lead, welding and cutting fumes, and improved factory environment through reduced fume and dust emissions.

Project 2025/202
Developing a cathodic protection technique to mitigate corrosion in Australian vacuum pans

Chief Investigator: Ian Rose, Manildra Harwood Sugars, and Ehsan Arzaghi, Queensland University of Technology (QUT)

Project Rationale

Corrosion is a common issue in ageing, large sugar production vessels, such as mild steel vacuum pans.

To extend pan life and reduce maintenance costs, stainless steel has been used to replace the upper sections of pans. However, this partial replacement inadvertently creates an electrochemical cell, accelerating corrosion at the interface between mild steel and stainless steel.

Recently, zinc sacrificial anodes (*) were tested to reduce corrosion rates but were found ineffective at pan operating temperatures (<65°C) and posed a risk of sugar contamination. Other sacrificial materials, such as magnesium, may also pose contamination risks to factory products.

Without careful monitoring and control, pan walls will gradually experience thinning, with possible catastrophic consequences including vessel implosion. Such an incident could shut down a mill for several weeks, while repairs are completed.

The cost of a failure of this magnitude is estimated to exceed $1.5 million, while repairing a corroded pan wall can also be a significant expense, exceeding $200,000.

The objectives:

- This project will evaluate the effectiveness of Impressed Current Cathodic Protection (ICCP) in minimising corrosion damage at critical locations within pans. (ICCP is an electrochemical method used to prevent corrosion in metal structures by applying a controlled electrical current.)
- Additionally, the project will develop an ICCP technique to optimise the protection of sugar vessels, through online monitoring and control.

Corrosion problems in large sugar production vessels, including evaporators and vacuum pans, has been a topic of discussion among mills in recent years. This project follows on from SRA's recently completed Project 2020/204 which investigated corrosion issues on the steam side of large sugar production vessels and was supported by Wilmar Sugar, Isis Central Sugar Mill and Sunshine Sugar. Project 2025/202 will extend the scope of the previous project to investigate corrosion control techniques tested in full-scale sugar production vessels.

Main outputs:

- Knowledge of the corrosion rates of a common material in the pans, and their correlation to varying operating conditions, without any corrosion control measures.
- Knowledge of the effectiveness of ICCP in reducing the corrosion rate of pans.
- An enhanced cathodic protection technique (based on ICCP) for application in large sugar production vessels, including pans and evaporators.

Outcomes of this project will be communicated to the milling industry prior to the 2026 season.

**Sacrificial anodes are metal components (such as zinc, aluminium and magnesium) used to protect other metal structures from corrosion, by being consumed themselves in the process.*

Benefits for industry

- Managing corrosion in pans will see a direct reduction in maintenance costs for large sugar production vessels. The estimated cost to install monitoring and control systems would be $15,000, compared to replacement cost of a pan wall of at least $200,000, depending on the size.

Long-term benefits:

- Mitigate repair and replacement costs of pans across Australian sugar factories through effective reduction of corrosion rates in pans. The replacement cost of vacuum pans in the industry is estimated to exceed $500 million.
- Improved asset management of the large sugar production vessels, including evaporators and ancillary pipework/valving in the industry, by adoption of the output ICCP technique in other factories.

BUILDING RESISTANCE
TO SOIL BORNE PATHOGENS

INNOVATIVE WAYS TO TACKLE PESTS ARE NOW WITHIN REACH

Soil borne pathogens cause sugarcane yield losses estimated at 40% annually, equivalent to financial losses of about $150 million a year.

Commercial sugarcane varieties are susceptible to these pathogens including root lesion nematodes (RLN), root-knot nematodes (RKN) and Pachymetra.

Effective control options for nematodes are limited to crop rotation using non-host crops and chemical (nematicide) applications which are expensive and offer only short-term control.

With funding from the Department of Primary Industries, a new project led by SRA's Cytogeneticist Dr Nathalie Piperidis, aims to deepen understanding and accelerate the development of sugarcane varieties with genetic resistance to these major soil-borne pathogens.

"Some wild sugarcane species have natural resistance to soil borne pathogens and we need to find the genes that control these defence mechanisms," Dr Piperidis said.

"We also need to refine the screening method to find these genes more efficiently. If we can develop a more accurate, reliable, cheaper, less labour-intensive and consistent screening technique through this project, it will allow resistant varieties to reach growers much sooner.

Pictured: (L to R): Chief Investigator, SRA Cytogeneticist, Dr Nathalie Piperidis, will work on the project with Dr Karen Aitken, Senior Principal Research Fellow at the Queensland Alliance for Agriculture and Food Innovation (QAAFI, UQ), Katherine Pinto Irish, a post doctorate technician with bioinformatic expertise, and SRA's pathology team.

"Building resistance in new varieties means we will have an effective control which avoids the use of expensive agricultural chemicals.

"Ultimately, we want to develop sugarcane varieties with resistance to all major diseases," Dr Piperidis said. "However, identifying resistance genes is challenging because sugarcane has a highly complex genomic structure. Genes may not function well together or could act antagonistically. The first important step is to identify these genes so we can then understand how they work."

This project involves a team of talented SRA scientists, all leaders in their respective fields, and also includes Dr Karen Aitken, Senior Principal Research Fellow at the Queensland Alliance for Agriculture and Food Innovation (QAAFI, UQ).

"Dr Aitken will contribute her extensive experience and expertise in molecular genomics, plant breeding and statistics. Karen is an expert in molecular markers in sugarcane and we are very pleased to have her on the team," Dr Piperidis said.

In this project, the team will inoculate sugarcane roots with pathogens and observe the development of the plant's defence mechanisms under the microscope. This will help define the timeline of infection and determine the necessary pathogen dosage for follow-up experiments on different cultivars – both resistant and susceptible. Comparing these results will enable the team to identify the specific defence mechanisms involved.

"We will be able to observe nematodes/Pachymetra attacking sugarcane roots, and in some cases, the formation of galls on the roots, which indicates the plant's ability to coexist (tolerate) the pathogen.

"Using a new technique called spatial transcriptomics, we will identify which genes are expressed for resistance, and precisely where they are active."

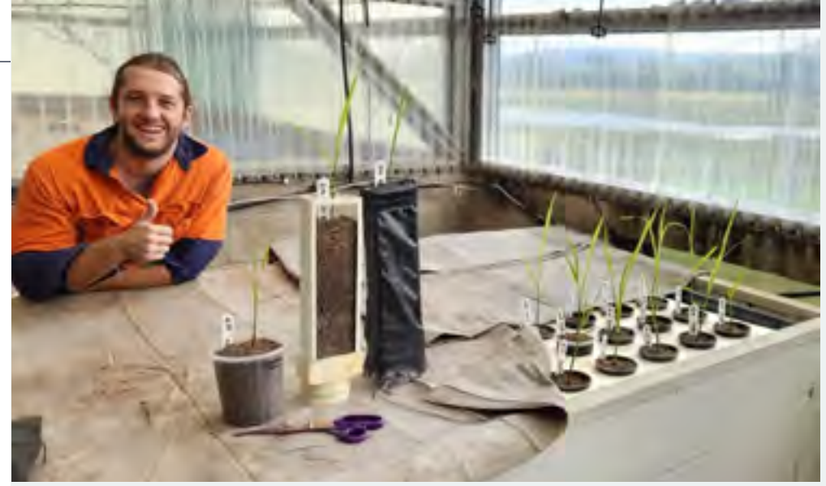
Chief Investigator, Dr Piperidis, will work with Co-Investigators, Lead Field Pathologist, Dr Seona Casonato, Manager of Biosecurity and Disease Screening, Dr Shamsul Bhuiyan, and Molecular Plant Pathologist, Dr Chuong Ngo. Katherine Pinto Irish, a post doctorate technician, will provide the bioinformatic expertise needed in the project.

Advanced Genomics and Spatial RNA-seq to identify resistance genes in sugarcane against soil-borne pathogens is a 3.5 year project awarded under the SRA 10th Anniversary Fund. This project is funded by the Queensland Department of Primary Industries.

Key Outcomes

- Understanding the resistance mechanism in sugarcane and where it is sited in the genome of the plant means that new varieties can incorporate these traits
- Previously difficult to control soil pathogens including RLN, RKN and Pachymetra will be able to be managed in an innovative way
- Using this knowledge resistance to all diseases of sugarcane may eventually be possible.

Queensland Government



PhD student Steele Ford is working at Woodford finding and assessing soil organisms that cause disease in sugarcane.

YOUNG SCIENTIST STUDIES SOIL-BORNE PATHOGENS
TO COMBAT YIELD LOSS

GROWERS HAVE A CHANCE TO INCLUDE THEIR OWN SOIL SAMPLES

PhD student Steele Ford is undertaking a comprehensive study to identify and assess organisms in soils that cause disease in sugarcane.

Symptoms of these pathogen attacks such as germination failure, poor crop establishment and death of plants in sugarcane farming systems are frequently mistaken for insect damage, nutrient deficiencies or excesses, soil compaction, or toxicity.

With climate variability and evolving farming practices, previously minor or unknown pathogens are emerging as serious threats. Recent studies have linked fungal pathogens to germination failure and poor crop establishment, causing up to 60-70 percent germination loss in affected areas. Read the SRA report.

However, there is limited information on the diversity and impact of soilborne pathogens in sugarcane - a gap which PhD student Steele Ford, based at SRA's Woodford Pathology Research Station, intends to fill.

Steele will survey soil-borne pathogens throughout the sugar industry. In collaboration with researchers from Griffith University, he will use advanced molecular techniques to identify pathogens from collected soil and root samples. These pathogens will then be tested under glasshouse and field conditions to evaluate their impact on plant health and yield.

How you can help

Steele is seeking assistance from sugarcane growers, regional CANEGROWERS and SRA staff , local productivity services, and other industry stakeholders to collect soil and root samples from all types of soil in the sugar industry.

He welcomes direct submissions of soil samples from growers and industry partners for testing for nematodes and other pathogens. All results and data will be handled with strict confidentiality, and feedback will be provided to contributors.

Do you think nematodes and Pachymetra are a problem on your farm? Find out through this project. Use this QR Code for instructions about collecting your soil sample for analysis.

For more information, please contact: Dr Shamsul Bhuiyan sbhuiyan@sugarresearch.com.au or Steele Ford sford@sugarresearch.com.au

To encourage young scientists to consider a career in the Australian sugar industry SRA provides sugar industry postgraduate scholarships each year for students at Australian universities and institutions to facilitate research and training projects in areas of value to growers and millers. This project is jointly funded by Griffith University's RingFenced Scholarship program and the SRA Postgraduate Research Award.

Key Benefits

- New insights into the diversity, distribution, and the damage potential of soil-borne pathogens in sugarcane
- Will inform management strategies to mitigate their effects and improve crop productivity
- Growers can use this study to assess their own soil by sending in samples.

NEW SRA PODCAST SERIES

HAVE YOU TUNED IN TO SRA'S NEW PODCAST SERIES?

Cane Matters was launched by SRA last month, and listeners can hear from SRA experts, including specialists in plant breeding, pathology, entomology, and more - the driving forces behind research, development, and adoption in the Australian sugarcane industry.

The podcast features strategic research, development and adoption projects, ensuring the sugarcane industry remains productive, sustainable and profitable.

- The first set of episodes are available now and feature former Variety Development Manager North, Dr Felicity Atkin;
- Manager Biosecurity and Disease Screening, Dr Shamsul Bhuiyan;
- Weed Science Leader, Emilie Fillols; and
- District Manager Central, Dylan Wedel.

New episodes will be released regularly and are available on major podcast platforms, including Apple Podcasts, Spotify, and YouTube, or via the SRA website at: **sugarresearch.com.au/podcast**

FREE ONLINE SUGARCANE WEEDS MANAGEMENT DIGITAL RESOURCE COMING SOON

To extend knowledge learnt at face-to-face Pre- and Post-Emergent Weed Management workshops presented by SRA's Weed Science Leader, Emilie Fillols, across the sugarcane industry, SRA is launching a digital resource for growers, productivity services officers and agronomists.

Modules will be free of charge and undertaken as an independent stand-alone course or to expand and reinforce workshop concepts.

"The project aims to preserve and transfer the content of the popular weed management workshops which have been presented over the past few years by Emilie Fillols into an accessible online format, designed for all sugarcane growers, productivity services officers and agronomists to access and complete," SRA Southern District Manager, Lisa Devereaux said.

"It will improve SRA's capacity to deliver weed management training to the sugarcane industry, regardless of where a grower lives in Queensland or northern New South Wales by utilising modern technology.

"Our face-to-face workshops will continue. A variety of supporting materials is also available on SRA's website. But for busy growers, the online format will enable them to complete the training at a time and pace that best suits them."

The Online Weed Management Training course has been funded by Sugar Research Australia. It is the second eLearning program produced by the R&D corporation. It continues SRA's aim to provide relevant science-based training over time for the sugar industry as resources become available. SRA thanks the key contributors responsible for the development and ongoing improvement of the program, particularly SRA Weed Scientist, Emilie Fillols. A grower who successfully completes this training program will understand fundamentals of weed management on their own farms including:

- Understanding the impact of weeds on cane productivity
- Understanding what tools can be used to identify weeds
- Learning Integrated Weed Management principles
- Understanding how pre-emergent and post-emergence herbicides work
- Being able to make better weed management decisions for a particular weed / crop scenario.

For further information email **elearning@sugarresearch.com.au**

To express your interest in the online training for the Pre-emergent weed management and/or Post-emergent weed management contact:
Lisa Devereaux
SRA Southern District Manager
ldevereaux@sugarresearch.com.au
0456 590 497

Key Benefits

- Extend your knowledge learnt at face to face Pre- and Post-Emergent Weed Management workshops
- Expand and reinforce workshop concepts or complete as a stand-alone course
- Weed management training resources are now available across the sugar industry

OFF THE GRID BUT AHEAD OF THE WORLD

WOODFORD - GLOBAL LEADERS IN SUGARCANE DISEASE MANAGEMENT

KEY BENEFITS

- Developing disease-resistant varieties of sugarcane for prevention, control and potential eradication of major cane diseases
- Managing high-risk sugarcane diseases saves the industry from hundreds of millions of dollars in potential losses to productivity and profitability
- SRA Woodford Pathology Research Station has developed world-class methods for improving disease screening testing to accurately rate varieties for their disease resistance.

Nestled beside the Glass House Mountains of Moreton Bay, SRA's Woodford Pathology Research Station lies deliberately off the beaten path.

Its strategic isolation isn't by chance – it forms a vital biosecurity buffer, allowing SRA researchers to safely study, and manage, existing high-risk diseases of sugarcane, without threat to the broader industry.

It's here that world-leading science works behind the scenes, serving as a frontline defence, bolstering the disease resistance capabilities of SRA's variety breeding program, while also responding to emerging pathogen threats. All work that is designed to safeguard the future prosperity of the Australian sugar industry.

"We have very strict 'Come Clean, Leave Clean' biosecurity protocols at Woodford," SRA Manager of Biosecurity and Disease Screening, Dr Shamsul Bhuiyan said of the station.

"With the work that we do here, with pests and pathogens that exist in the industry, it's absolutely paramount that there are no biosecurity breaches – ever. So, no plant materials or soil ever leave the station. And it's why we are so isolated here, surrounded by mountains."

Buffering industry from economic losses

For almost 30 years, researchers at Woodford have developed pre-eminent disease screening techniques to better understand disease resistance ratings of new varieties progressing through SRA's Variety Breeding Program.

It's work that has led to not only developing more disease-resistant varieties of cane, but also has seen the research station emerge as a global leader in disease prevention, management and eradication.

Dr Bhuiyan, who has worked at Woodford since 2012, believes the work conducted at the site by SRA, and by its predecessor – the Bureau of Sugar Experiment Stations (BSES) – has saved industry from severe production losses by developing and improving disease resistance methods.

"We are very confident in our screening ability and our diagnostic work," Dr Bhuiyan said. "For example, when we first started screening for smut (27 years ago, in Indonesia and WA), about 80% of our commercial varieties were susceptible to smut. Now, we have less than five per cent susceptible to smut," he said.

"I think if we didn't have the results that we have achieved over the years, industry would have suffered hundreds of millions of dollars in lost productivity, as we've seen in the past from serious disease outbreaks, such as smut, orange rust, and Fiji leaf gall."

Strengthening variety development and striving for sustainable disease management

Each clone that progresses through SRA's Variety Breeding Program is screened for all seven major diseases of sugarcane – smut, leaf scald, red rot, mosaic, Fiji leaf gall, and ratoon stunting disease (RSD) in Woodford, and Pachymetra root rot in Tully, during its three selection stages.

Woodford screens almost 2,500 clones/year. It's work that weeds out susceptible varieties from the earliest stages of breeding, and over time, can lead to the selection of disease-resistant varieties.

"All pathogens need a host, so if you have a host that is not friendly, the pathogen can't survive. So, the more resistant varieties that we can deliver through the breeding program, the harder it is for the pathogen to survive, multiply and spread," Dr Bhuiyan said.

"Our breeding program and screening program together, have now successfully developed varieties resistant to smut, Fiji Leaf gall, brown rust, orange rust, mosaic and leaf scald diseases. Fiji leaf gall disease has not been found in commercial cane growing areas for the past 15 years."

Research leading the world

The SRA disease screening program is a pioneer in developing innovative methods for disease management in sugarcane.

A significant portion of the research at Woodford focuses on refining disease management strategies, enhancing diagnostic capabilities, and improving existing screening methods. Dr Bhuiyan emphasised the importance of staying at the forefront of innovation to maintain global leadership in the industry.

"Most of our screening methods at Woodford have been developed in-house by SRA/BSES scientists," Dr Bhuiyan said. "Techniques for screening leaf scald, Fiji leaf gall, mosaic, and nematodes were all pioneered here and are now adopted worldwide.

"But we're always looking at other new robust disease screening methods, to diagnose disease more quickly and for less cost."

If you'd like to learn more about SRA's Woodford Station, tune in to Episode 4 of SRA's newly-released Cane Matters podcast where Dr Shamsul Bhuiyan discusses the work undertaken at the station to safeguard the Australian sugar cane industry.

Woodford Pathology Research Station's activities includes screening about 2,500 clones a year for diseases such as smut, Fiji Leaf gall, brown rust, orange rust, mosaic and leaf scald diseases. One-eyed setts are used to ensure clean seed germinates successfully in resistance trials. (second from the left and far right): Dr Shamsul Bhuiyan.

SAFEGUARDING THE AUSTRALIAN SUGAR INDUSTRY FROM SUGARCANE SMUT

In 2026, Australia will mark 20 years since the detection of sugarcane smut (*Sporisorium scitamineum*) on the east coast, near Childers, Queensland. This virulent fungal disease, with its black whip-like structures filled with millions of airborne spores, resembled a contagion from a horror film. Easily spread by wind and machinery, it caused widespread anxiety among cane growers as it rapidly infiltrated major sugarcane regions in Queensland and New South Wales in 2006 and onwards.

Long before sugarcane smut reached the East Coast, Australian scientists had already identified it as a high-risk exotic disease in 1997. The first domestic detection took place in 1998 in the Ord River Irrigation Area of Western Australia. Clearly, it was obvious that the disease could appear in the main sugarcane-growing region at any time.

Fortunately, both Australian scientists and the sugar industry had been proactive. In 1997, Australian researchers, in collaboration with Indonesian counterparts, initiated the first screening trials to assess the resistance of Australian sugarcane varieties to smut. Simultaneously, a contingency plan was developed by scientists at Sugar Research Australia (formerly BSES), in partnership with industry stakeholders.

Following the WA detection in 1998, efforts intensified. A second screening trial was launched in collaboration with CSIRO and the WA Department of Agriculture. These trials revealed that approximately 70% of the tested clones were susceptible to smut.

Armed with this data, a pre-incursion breeding strategy was implemented. The goal was to ensure that at least 50% of crosses in the SRA(BSES)-CSIRO variety improvement program had intermediate or resistant ratings. A photoperiod facility at Meringa was dedicated to smut-resistant breeding to enhance the capacity.

By 2006, just before the East Coast incursion, only 10% of new crosses were susceptible to the disease. The breeding program had successfully shifted from 0.4% resistant crosses in 2000 to over 50% by 2007—transforming the genetic landscape of Australian sugarcane.

In 2008, the SmutBuster program, part of the BSES-CSIRO variety improvement initiative, aimed to conduct research and development focused on using high-value smut-susceptible parents to breed new smut-resistant, high-yielding varieties. Launched by the BSES-CSIRO team, the program aimed to recover productive traits from high-value but vulnerable parents. Its goal was to develop new, high-yielding, smut-resistant varieties—combining resilience with performance.

The industry responded quickly. Resistant varieties were promptly adopted, and susceptible ones were proactively removed—even before the incursion. This decreased the production and spread of inoculum in the environment and slowed the disease's progression spread.

Thanks to strategic research, development, and education programs, the proportion of smut-resistant clones in Australia rose from less than 10% in 2004 to over 50% by 2023. Today, fewer than 5% of Australian sugarcane varieties are susceptible to smut.

- Annual savings: Estimated at $100 million due to reduced losses and improved productivity.
- Avoided losses: Over $200 million in direct losses were prevented by early adoption of resistant varieties. A two-year delay could have had catastrophic consequences.

Key Benefits

- Building sugarcane's resistance to black smut and adoption of resistant varieties is one of the industry's biggest success stories
- Today, fewer than 5% of Australian sugarcane varieties are susceptible to smut.
- Annual savings due to reduced losses and improved productivity are estimated at $100 million.

Field hand Peter Hansen busy cutting one-eyed setts.

16,000 REASONS TO IMPROVE GERMINATION

Sixteen thousand. It's a nice round figure. That's the total number of one-eyed setts to be cut and planted to the field at Bundaberg Station this season, according to Variety Support Officer Clare Hogan's best guestimate.

"Bundaberg had poor germination in our propagations last year because we now source most of our material for trials from other SRA stations. We believe the reason for the poor germination of off-station material is due to the requirement to use the Cold Soak Long Hot Water Treatment (CSLHWT) process for effective disease management," Ms Hogan said.

"Traditionally, we have planted this treated material straight into the ground as whole stalk, with poor outcomes. When we have germination failures, we need to wait until next planting season to source that material again.

"Consequently, this year, we are cutting up all material coming from off-station and requiring treatment to produce one-eyed setts in trays. These will spend about one month in the growhouse* and slab before being planted in the field."

"While it means a lot more effort, a germinated one-eye sett has a good chance of survival when planted to the field," Ms Hogan said. "We have more than 500 clones to do this year which translates to about 16,000 one-eye setts.

"Using one-eye-sett material before planting in the field will improve our germination, which it did for all clones we processed this way last year. The material that has been processed from Central and Herbert will be planted into propagations in mid-September. SRA North and Burdekin have also sent us their first batch of material with a second batch expected soon. Of the 500 clones, 400 of these are from Central which will be propagated and go into 2027 FAT trials.

"The remaining 100 will be used for selection in 2026 FAT trials. They will be planted and grown for 12 months. The plant crop will then be harvested and this process will be repeated until the second ratoon is harvested in the 2028 season and all data has been collected from each year's crop.

"A big thank you to all regions for taking the time to send cane to make up for our losses last year."

Results of the improvement or otherwise in germination rates from using one-eyed setts will be closely monitored. If it proves to be advantageous the method will become standard practice for cane received in Bundaberg which requires treatment.

Key Benefits

- Using Cold Soak Long Hot Water Treatment (CSLHWT) clean seed in planting is an essential tool for disease management
- SRA Bundaberg is tackling last year's germination failures by using an improved method
- Germinating one-eye setts takes more work but improves survival rates in the field
- If they prove successful, one-eye setts will become standard practice in Bundaberg.

**The 'growhouse' is a greenhouse where the plants go initially which is protected from the elements and a few degrees warmer than outside. The 'slab' is essentially the nursery - a big concrete slab with irrigation and shade cloth around the sides used to protect the plants from wind.*

AROUND **THE DISTRICTS**

It's been a busy time for SRA staff in all sugar growing districts, working on in-field research projects, innovative trials, variety breeding program activities and other adoptable practice change outcomes designed to increase industry productivity.
Here is a snapshot of this work, carried out over recent months.

SRA would like to thank all growers, milling staff, productivity services and harvester operators who have participated in our field trials. Without your time and generous support, the full extent of our research activities, would not be possible.

Imidacloprid trial sites established

As reported on Pages 4-5, trials sites have now been established across all five sugar growing districts of Queensland, as part of SRA's high-priority quest to find alternatives to imidacloprid, to effectively control of canegrubs.

Lead Entomologist, Dr Kevin Powell and his skilled entomology team, with the support of SRA's District Managers, have established trial sites on commercial farms in Southern, Central, Burdekin, Herbert, North and Far Northern Districts, with trials to begin in October.

Pictured (above): SRA project team – Entomologist Dr Emtia Chandrima and Entomology Research Scientist Dr Samuel Bawa at one of the canegrub trial sites in the Mackay region.

Pictured (above) L-R: SRA Translation Research Manager, Dr Barry Salter and SRA District Delivery Officer, Glen Park, planting a long-term soil health trial at Tully. It's one of four trial sites included in Project 2024/010.

Agonomy projects in full swing

SRA staff and project collaborators have been busy in the field establishing trials and collecting samples for 10th Anniversary Research Fund agronomy projects, announced earlier this year.

Trial sites have been planted at Tully, Ingham and Mackay for *Project 2024/010: Long-term soil health trials to assess farming opportunities and impacts.*

Led by SRA Translation Research Manager Dr Barry Salter, the project is exploring a number of research questions, including assessing trash management strategies. The project aims to identify new practices that improve long-term sugarcane soil capital.

Work has also been carried out across multiple trial sites as part of Project 2024/018. The project is investigating if trends in silicon (Si) uptake are impacting crop performance; if different soil chemical properties influence Si availability; and if changes are required to soil and/or plant tissue assay critical values, to ensure adequate Si nutrition.

Burnt cane Harvest Mate Auto trials

SRA staff from across the North have been involved in a series of burnt cane trials in the Burdekin, as part of the Harvest Mate Auto project.

At present the Harvest Mate app is only applicable to single row, green cane harvest. Data from the burnt cane trials will be fed into the app to allow its functionality to be extended to burnt cane conditions.

Altering a harvester's fan settings can have a significant impact on cane losses and extraneous matter (EM) levels in the cane supply. The burnt cane trials allow SRA to collect data on these losses and EM levels.

Pre-dawn work carried out as part of Harvest Mate Auto burnt cane trials.

Pictured (above): SRA General Manager Variety Development, Dr Garry Rosewarne, addresses Far Northern RVC members at Meringa last month (August). So far, he's met with RVCs in Southern, Burdekin, Herbert and Northern districts, and plans to speak with Central and New South Wales RVCs in coming weeks.

Shaping the future of Variety Breeding

In recent months, General Manager Variety Development, Dr Garry Rosewarne has toured most districts to discuss the future of SRA's Variety Breeding Program, seeking input into the direction of the program from Regional Variety Committees (RVCs).

Mr Rosewarne believes there is scope to advance the quality of new varieties emanating from the program, and will continue to work with growers, millers and other industry stakeholders to help shape the breeding program in the future.

New District Manager Far North

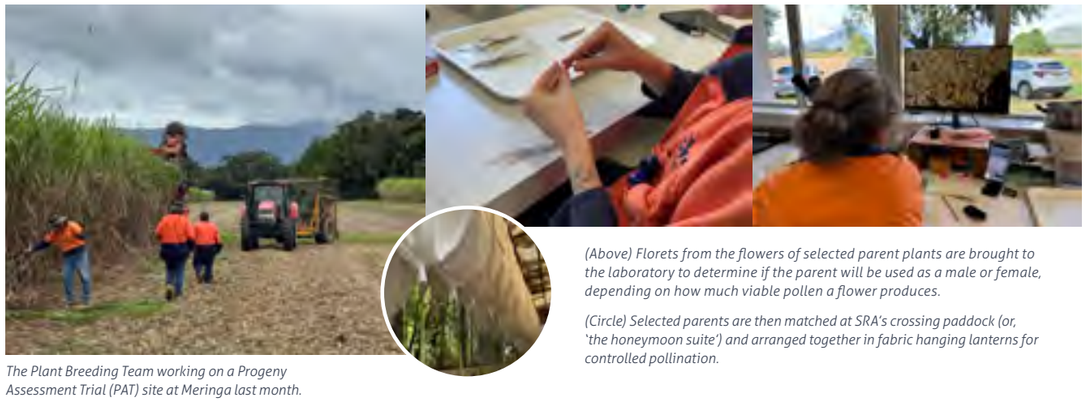
Paul Calcino has hit the ground running after taking over the role of District Manager, Far North, in late August.

Paul brings a strong background in agriculture and returns to SRA after having previously worked at Meringa Station as District Delivery Officer, Far North, from 2021-2024. He first joined SRA in 2019, undertaking a traineeship at Meringa, before taking on the role of Adoption Officer, Nutrient Management Planning from 2020-2021.

Paul Calcino (pictured right) with Gordonvale cane grower Luigi Piccolo

Variety breeding across all districts

With the harvesting season in full swing, SRA's variety breeding teams have been busy with trial work across all regions, including Progeny Assessment (PAT), Clonal Assessment (CAT) and Final Assessment Trials (FATs). At the *Meringa Station*, SRA's all important cross pollination of sugarcane varieties has now been completed for the year.



The Plant Breeding Team working on a Progeny Assessment Trial (PAT) site at Meringa last month.

(Above) Florets from the flowers of selected parent plants are brought to the laboratory to determine if the parent will be used as a male or female, depending on how much viable pollen a flower produces.

(Circle) Selected parents are then matched at SRA's crossing paddock (or, 'the honeymoon suite') and arranged together in fabric hanging lanterns for controlled pollination.

(Above:) Trimming and fertilising seedlings in the nursery on Bundaberg Station is part of the care new clones receive before they are planted out into family plots in Progeny Assessment Trials (PATs).

SRA Mackay Plant Breeder Ankush Wankhade (pictured above) performed the final inspections of seedlings in the greenhouse before they were planted in Progeny Assessment Trials (PATS). The Plant Breeding Team planted the first of its Final Assessment Trials (FATs) for the 2025 season, in July, and are preparing to plant three Clonal Assessment Trials (CATs) in coming weeks.

RESEARCH PROJECT INVESTMENTS

PROJECT IDENTIFIER	TITLE	CHIEF INVESTIGATOR	RESEARCH AGENCY	END DATE
Research Mission 1: Profitable and Productive				
2022/012	Use of machine learning to determine the extraneous matter and billet length in cane consignments	Geoff Kent	Queensland University of Technology	1/02/2027
2022/014	Australian Sugar Industry – Development of factory training modules – Phase 3	Geoff Kent	Sugar Research Institute	1/03/2028
2023/201	Bagasse fly ash system performance benchmarking	Jonathon Gilberd	Wilmar Sugar Australia Limited	4/09/2024
2023/203	Billet Quality Assessment	Barton Wixted	Grifith University	30/05/2025
2024/201	Hybrid pH control strategies to reduce sucrose losses and control corrosion in sugar factory evaporators	Aaron Baker	Sunshine Sugar	1/07/2025
2024/202	Demonstrate the use of a microwave dry substance transducer for controlling high grade boilings	Bryan Lavarack	Mackay Sugar Limited	1/07/2025
2024/203	Greenhouse gas emissions from sugar factory boilers	Line Jenssen	Wilmar Sugar Australia Limited	30/06/2025
2024/204	Thermo-digester for Rapid Conversion of Mill Mud to Green Fertiliser	Stephen Xu	Charles Darwin University	1/07/2025
2024/003	ARC Research Hub for Engineering Plants to Replace Fossil Carbon	Nathalie Piperidis	Sugar Research Australia	12/08/2029
2024/016	Harvest Mate Auto – Improving Economic Outcomes	Dylan Wedel	Sugar Research Australia	1/05/2029
2024/017	Sugarcane Sucrose Estimation with Hyperspectral Imaging and Artificial Intelligence	Sijesh Natarajan	Sugar Research Australia	1/09/2029
2024/301	Combining drone-captured phenotypes and genomic prediction to optimise clonal selection in sugarcane (PD1)	Sijesh Natarajan	Sugar Research Australia	12/08/2029
2024/302	Applying genomics tools for novel nematode resistance in sugarcane (HDR9)	Christopher Tom	Sugar Research Australia	12/08/2029
2024/303	Genomic prediction of specific combining ability in sugarcane (HDR20)	Andrew Rigby	Sugar Research Australia	12/08/2029
2025/201	Reducing factory exposure to lead fumes and dust and welding and cutting fumes	Geoff Kent	Queensland University of Technology	30/06/2026
2025/202	Developing a cathodic protection technique to mitigate corrosion in Australian vacuum pans	Aaron Baker	Manildra Harwood Sugar (Sunshine Sugar)	30/06/2026
2025/203	Evaluation of an industry-first hybrid locomotive for sugarcane transport	Ian Rose	Mackay Sugar Limited	31/08/2026
Research Mission 2: Resilient and Enduring				
2018/010	Moth borers - how are we going to manage them when they arrive?	Kevin Powell	Sugar Research Australia	1/06/2025
2020/004	Beyond Imidacloprid - Chemical and Biorational Alternatives for Managing Canegrubs	Kevin Powell	Sugar Research Australia	1/06/2025
2020/008	Transformational crop protection – Innovative RNAi biopesticides for management of sugarcane root feeding pests	Neena Mitter	The University of Queensland	12/05/2025
2022/001	Managing major diseases in sugarcane cropping systems using carbon nanodots	Qin Li	Griffith University	1/05/2025
2022/002	Updating the Sugarcane Industry Biosecurity Plan	Stuart Kearns	Plant Health Australia	1/06/2027
2022/004	Soldier fly diagnostics, distribution, and development of an artificial diet	Kevin Powell	Sugar Research Australia	1/06/2025
2022/005	Assess weed impact/distribution for prioritisation	Emilie Fillols	Sugar Research Australia	10/06/2025
2022/006	Development of a resistance screening method for chlorotic streak	Chuong Ngo	Sugar Research Australia	1/06/2026
2022/007	Delivery of a pest and disease diagnostic step change for the sugarcane industry (RSD - NIR)	Seona Casonato and Steve Staunton	Sugar Research Australia	1/12/2025
2022/016	Viruses to aid biological control of major root-feeding pests of sugarcane	Michael Furlong and Kayvan Etebari	The University of Queensland	1/08/2027
2023/403	Towards a new screening method for Pachymetra part1: characterization of the plant-host mechanism	Nathalie Piperidis	Sugar Research Australia	1/07/2026
2024/001	ARC Industrial Transformation Training Centre – Centre for Plant Biosecurity.	Stephen Mudge	Australian National University	30/06/2029
2024/007	Carbon nanodots - Woodford component	Shamsul Bhuiyan	Sugar Research Australia	1/06/2025
2024/012	Improving the technology readiness level of AI-based weed zonal and spot spraying for sugarcane	Emilie Fillols	Sugar Research Australia	1/12/2027
2024/015	Characterising the vector of sugarcane streak mosaic virus: a major biosecurity threat for Australian sugarcane	Kevin Powell	Sugar Research Australia	1/12/2027
2024/401	Proactive Preparedness for Incursion of Leafhopper Vectors of White Leaf Disease – A Major Biosecurity Threat	Kevin Powell	Sugar Research Australia	8/08/2025
2024/402	The Sweet Smell of Success: Sustainable Canegrub Management using Host Plant Volatiles	Samuel Bawa	Sugar Research Australia	19/12/2025
2025/001	Beyond Imidacloprid - Ensuring Effective and Sustainable Canegrub Control for the Future	Kevin Powell	Sugar Research Australia	1/05/2028
2025/401	Insect on insect warfare: Insect venoms as pesticides	Mark Jackson	The University of Queensland	1/03/2026
2025/403	Unlocking nature's signals: Discovering the semiochemicals for effective management of Australian native sugarcane soldier fly	Marlize Bekker	The University of Queensland	1/04/2027

Research Mission 3: Diversified and Adaptable				
PROJECT IDENTIFIER	**TITLE**	**CHIEF INVESTIGATOR**	**RESEARCH AGENCY**	**END DATE**
2022/018	Building industry engagement capability for a diversified and adaptable Australian sugarcane industry	Madeline Smith	Queensland University of Technology	30/06/2024

Research Mission 4: Sustainable and Efficient				
2020/804	Reducing herbicide usage on sugarcane farms in reef catchment areas with precise robotic weed control	Emilie Fillols	Sugar Research Australia	30/06/2024
2022/011	Understanding phosphorous requirements for sugarcane crops growing in alkaline soils	Danielle Skocaj	Sugar Research Australia	13/12/2027
2022/801	XXXX Lower Burdekin Smart Irrigation Project	Simon Clarke	Sugar Research Australia	1/05/2025
2023/801	Targeting balanced nutrition and productivity constraints in the Herbert	Simon Clarke	Sugar Research Australia	30/06/2026
2024/010	Long-term soil health trials to assess farming system opportunities and impacts	Barry Salter	Sugar Research Australia	1/01/2029
2024/014	Crop response to nutrient application following mill by-product application to optimise nutrient inputs and manage impacts on CCS	Julian Connellan	Sugar Research Australia	31/10/2028
2024/018	Are trends in silicon uptake a reason for concern?	Danielle Skocaj	Sugar Research Australia	30/11/2028
2024/024	Life Cycle Assessment of Raw Sugar Manufacturing	Simon Clarke	Sugar Research Australia & Integrity Ag	30/04/2026
2024/804	Fine-tuning nutrient and constraints management in the Tully mill area	Peter Sutherland	Tully Cane Productivity Services Limited	30/06/2026
2024/803	Tully & Murray fine-scale water quality monitoring project	Alicia Buckle	Terrain NRM	01/09/2026
2024/505	Enhancing Australian sugarcane nitrogen use efficiency: quantifying loss pathways and evaluation novel dual inhibitor effectiveness	Deli Chen	University of Melbourne	30/6/2029
2024/511	Rapid field-based tissue measurement using an integrated smartphone and lab-on-a-chip system	Liang Wang	CRC for High Performance Soils	31/03/2027
2024/512	Sugarcane subsoil management for improvement of carbon and nutrient use efficiency	Mehran Rashti	Griffith University	1/5/2029
2024/514	Using AI to optimize sugarcane planting practicies	Rudi Bartels	Griffith University	31/12/2028

Research Mission 5: Resourced and Skilled				
2018/015	Sugar Milling R & D Capability Building Program	Geoff Kent	Queensland University of Technology	31/03/2027
2019/102	PhD Scholarship - Genetic solutions for determining fibre quality traits in sugarcane	Angela O'Keeffe	The University of Queensland	31/03/2024
2021/101	PhD Scholarship - Optimising mill mud and ash applications for soil improvement and carbon sequestration	Hannah Green	James Cook University	01/02/2026
2021/102	PhD Scholarship - Systems biology for sustainable agriculture: evaluation of plant growth-promoting bacteria to produce high-performing biofertilisers	Ian Petersen	The University of Queensland	30/04/2025
2021/401	Research Award - Risk assessment for the newly discovered parasitic nematode *Pratylenchus parazeae* in the Australian sugarcane industry	Shamsul Bhuiyan	Sugar Research Australia	1/04/2024
2022/101	PhD Scholarship - A novel biosensor device for on-farm sugarcane disease diagnosis	Simon Strachan	Griffith University	29/02/2024
2022/401	Research Award - Harnessing the SynBio potential of Australia's stingless bees, the first step	Natasha Hungerford	The University of Queensland	31/03/2025
2022/402	Research Award - Genomic prediction of ratoon yield robustness	Eric Dinglasan	The University of Queensland	14/05/2024
2023/101	Development of an automated system to perform localised in-crop replanting of sugarcane gaps	Bruen Smith	University of Southern Queensland	19/03/2027
2023/103	PhD Scholarship – An economic and agronomic assessment of Nitrogen Use Efficiency and the factors influencing it	Kristopher Woodrow-Smith	The University of Queensland	31/12/2025
2023/801	DES 1231311 Sugarcane practice change program - Herbert	Simone Clarke	Sugar Research Australia	31/08/2026
2023/802	DES 1231311 Sugarcane practice change program - Southern	Lisa Devereaux	Sugar Research Australia	31/08/2026
2024/102	Carbon dioxide removal through the enhanced weathering of basalt in acidic soils under sugarcane	Frederick Holden	James Cook University	01/02/2028

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