

# CaneConnection

Summer 2016



p4

**Peanut rotation**  
lifts marginal soil  
production

p10

Improving  
**sugarcane harvest**  
efficiency through  
collaboration

p20

Tracing the  
origins of ratoon  
stunting disease  
of sugarcane

p26

Mastering your soils  
for greater  
productivity and  
profitability

## Welcome to the Summer 2016 edition of *CaneConnection*

*This edition of your quarterly magazine once again updates you on the latest research and adoption activities occurring at SRA, as well as other important innovation that is occurring within the Australian sugarcane industry.*

With the harvest being a major focus in recent months, this edition features a range of information about SRA activities in relation to improving harvesting efficiency.

As you can read from pages 10 to 15, there have been a range of demonstration trials that have occurred in recent months with SRA and industry collaborators. As part of that, we take a close look at the Isis region, which is making major positive steps forward this season. Other activity is occurring across the industry and will feature in future editions, including activities that are part of the harvest efficiency Rural R&D for Profit project.

This edition also looks at the collaboration between Wilmar and SRA within the Burdekin plant breeding program (page 6-7), looks at how peanuts are boosting sugarcane production at Bundaberg (page 4-5), and also how mill data is being used to drive productivity gains (page 24-25).

We also have a look at some interesting grower innovations occurring in relation to controlled-release fertilisers, share-owning machinery, and how sugarcane varieties are performing in several regions in 2016.

We hope that you find this magazine informative, and if you have any comments or suggestions, please contact me on [bpfeffer@sugarresearch.com.au](mailto:bpfeffer@sugarresearch.com.au) or (07) 3331 3340.

**Brad Pfeffer**

*Executive Manager, Communications*

**Disclaimer:** In this disclaimer a reference to 'SRA', 'we', 'us' or 'our' means Sugar Research Australia Limited and our directors, officers, agents and employees. Although we do our very best to present information that is correct and accurate, we make no warranties, guarantees or representations about the suitability, reliability, currency or accuracy of the information we present in this publication, for any purposes. Subject to any terms implied by law and which cannot be excluded, we accept no responsibility for any loss, damage, cost or expense incurred by you as a result of the use of, or reliance on, any materials and information appearing in this publication. You, the user, accept sole responsibility and risk associated with the use and results of the information appearing in this publication, and you agree that we will not be liable for any loss or damage whatsoever (including through negligence) arising out of, or in connection with the use of this publication. We recommend that you contact our staff before acting on any information provided in this publication. **Warning:** Our tests, inspections and recommendations should not be relied on without further, independent inquiries. They may not be accurate, complete or applicable for your particular needs for many reasons, including (for example) SRA being unaware of other matters relevant to individual crops, the analysis of unrepresentative samples or the influence of environmental, managerial or other factors on production.

# Contents

- 03 Q240<sup>®</sup> delivering solid results in the Burdekin
- 04 Peanut rotation lifts marginal soil production at Bundaberg
- 06 Plant breeding collaboration delivers industry-wide benefits
- 08 On the hunt for improved NUE options
- 10 CLEAN team improving harvest efficiency at Isis
- 12 Practice changes add up to significant efficiency gains
- 13 The in-field sucrose loss measurement system (ISMS)
- 14 On-ground work demonstrates harvesting efficiency at a regional level
- 16 Harnessing cane's potential for animal feed
- 18 Solid yields and sugar for Rocky Point growers
- 20 Tracing the origins of ratoon stunting disease (RSD) of sugarcane
- 22 Strategic approach delivers long-lasting benefits for grub control
- 24 Collaborative use of mill data creates path for productivity improvement
- 26 Mastering your soils for greater productivity and profitability
- 28 New investment to allow for improved fertiliser efficiency
- 29 SRA welcomes Anthony Curro to Brandon research station
- 30 How effective is your fallow?
- 31 Positive performance sets 2016 as a year to remember
- 32 Total Research Investment

ISSN 2203-1111 (Print) ISSN 2203-112X (Online)

© Copyright 2016 by Sugar Research Australia Limited. All rights reserved. No part of *CaneConnection* (this publication), may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of Sugar Research Australia Ltd. SRA acknowledges and thanks its funding providers, including levy payers (sugarcane growers and millers), the Commonwealth Government, and the Queensland Government (Department of Agriculture and Fisheries).





Burdekin grower Laurence Dal Santo in Q240<sup>®</sup> first ratoon in late October 2016.

## Q240<sup>®</sup> delivering solid results in the Burdekin

*Burdekin grower Laurence Dal Santo is having positive results with the relatively new variety for the region, Q240<sup>®</sup>.*

Following planting in April 2015, this year's plant crop yielded slightly over 180 tonnes of cane per hectare and was between one and two units above the mill, outperforming his other plant crop of Q252<sup>®</sup>.

"It got away early and had a good strike, and we kept it clean and the water up to it, and the sunlight did the rest," he explained.

"It has been a good growing year and the rain we received in June has put more weight on the crop, which is good, although will also prolong the season."

Laurence farms 240 hectares and has about 10 percent of his farm to Q240<sup>®</sup>, which he is expecting to increase to 20 percent by this time next year, and to further increase in 2018.

It sits alongside other varieties that he grows including Q252<sup>®</sup>, Q253<sup>®</sup>, and Q232<sup>®</sup>, with the increase in Q240<sup>®</sup> largely replacing Q208<sup>®</sup>, which for Laurence performed poorly in comparison to other varieties.

Q240<sup>®</sup> has been approved across the industry and was available commercially for Burdekin growers in 2013, following an initial release in the southern region in 2009. The variety is increasing in popularity. In 2015 it represented just under four percent of the Australian crop, including about 3.5 percent of the Burdekin region.

It is resistant to two of the major diseases of concern in the Burdekin region, sugarcane smut and leaf scald.

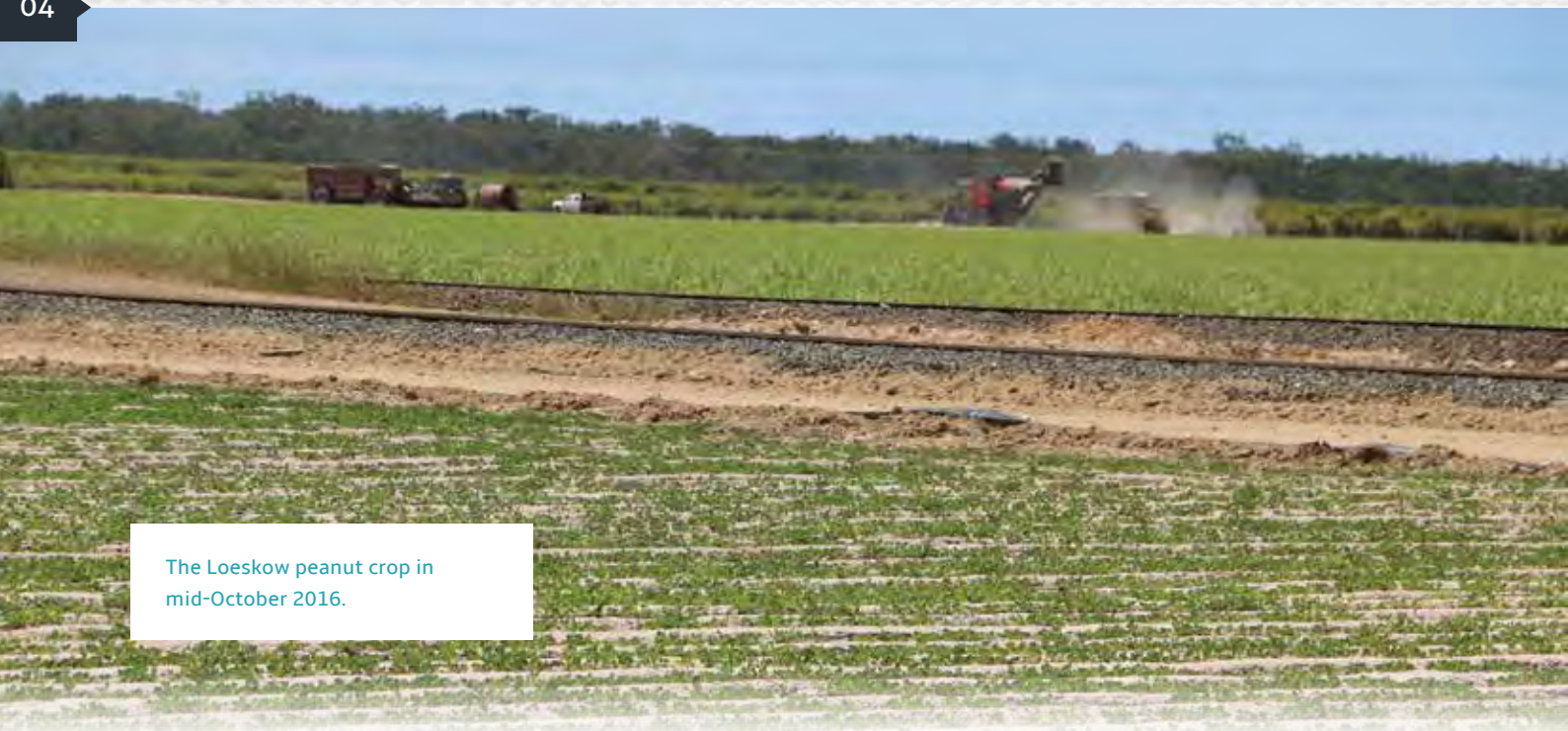
In Burdekin trials it produced good tonnes but moderate sugar, which is what Laurence said that he looks for in a variety.

"We tend to get good sugar here, so I look for high tonnes."

Laurence grows his cane on dual rows on 1.8 metre centres, which he says has delivered multiple benefits that he has seen over the last seven years since switching to wider rows.

"Even when cutting after the rain we are still seeing a stool that hasn't been touched or squashed, the ground between the wheel tracks remains soft, and there are efficiencies with irrigation penetration, and also with fertilising and tillage being in a wider pass," he said.

More information on the variety Q240<sup>®</sup> and other sugarcane varieties is available via SRA's online variety selection tool, QCANESelect™, at <http://tools.sugarresearch.com.au/QCANESelect/>



The Loeskow peanut crop in mid-October 2016.

## Peanut rotation lifts marginal soil production at Bundaberg

*The Loeskow family at Bundaberg is successfully using a peanut rotational crop to improve soil health and lift sugarcane production. By Brad Pfeffer*

The Loeskow family admit that the soil on their 1600 hectare property generally does not look like the type of country that is capable of producing plant-cane crops of 200 tonnes of cane per hectare (TCH).

And while they aren't there yet, Jason Loeskow said that with the right management and conditions that the lofty goal of 200 TCH could be possible, thanks to introducing peanuts into the rotation at the end of the crop cycle.

Last year, they averaged 104 TCH and this year an 107-108 TCH average, with some of the best autumn-plant cane blocks after peanuts yielding 175 TCH.

"This soil is about as marginal as you can find in the district," said Jason, who farms with his father Neville.

"We are only about 5km from the coast and there are some parts of the 1150 ha under cultivation with cane that have problems with salinity.

"But we believe that if we get everything right then up to 200 TCH is possible on this dirt, with the peanut rotation, and I'd like to think that we could get to a 115 TCH average."

The journey with peanuts began in the 1980s, following a transition from grazing to cultivation that occurred over the previous 20 years. The virgin country had comfortably produced 100-120 TCH, but the Loeskows had seen that drop steadily to 100 TCH and then 80 TCH.

"If we do plough-out replant today, which we did five years ago, we will only get around 60-70 TCH."

Peanuts were first introduced to their farm to control nematodes, which were creating a large expense with nematocide application required for their control. The peanuts also allowed for better weed control of grasses.

"There were questions about planting peanuts into poor soils, but we determined it was the only way to lift our cane production," Jason said.

"The severely salt affected country might only yield 2 t/ha of peanuts, but at least that gives us the opportunity to grow 100 TCH the following year."

They have a strong focus on inputs for both crops to achieve results. Both crops require around 5 ML/ha, although with peanuts being the high-risk and high-cost crop they receive the priority.



They generally need 5 t/ha to recover costs and expect to average 6 t/ha in their better soil for the peanuts, which are typically planted in September or October.

With about 20 percent of the farm planted to peanuts, they also know that getting the peanut crop right is vital for setting up a good subsequent cane crop cycle.

"About one third of our expenses go to the peanuts, be that wages or fuel or fertiliser."

They have also made an investment in machinery over the years that has allowed them to conduct all of the peanut farming themselves, as well as do contracting work, which has helped the economics stack up.

He said he expected a peanut price this year of about \$1600/t, which although isn't as big a jump as the cane price in 2016, was still the highest they had seen.

They have also focused on a range of factors that have all contributed to productivity, such as GPS guidance, timing farming practices, recovering or reclaiming land that is severely salt affected, and ensuring that ground is levelled perfectly for flood irrigation.

Their main varieties are KQ228<sup>®</sup> for early sugar, Q232<sup>®</sup> for salt tolerance and ratooning, Q240<sup>®</sup>, Q238<sup>®</sup>, and Q208<sup>®</sup>.

In summary, Mr Loeskow said that for their situation the peanuts were the difference in making their sugarcane operation viable.

Research through the Sugarcane Yield Decline Joint Venture (SYDJV) has shown the value of rotational cropping as a tool to address yield decline, including the benefits of peanuts to control nematodes in poorer, sandy soils.

Senior Farming Systems Agronomist with the Queensland Department of Agriculture and Fisheries, Neil Halpin, said that in the Bundaberg region this was an important consideration for the long-term of cropping industries such as sugarcane and legumes.

"With strong competition for land for high value agriculture, our cane and legume country is moving increasingly into marginal soil, so this is the type of work required to keep production in those soils," he said.

"We have a lot of data on the benefits of legumes and the industry has a strong understanding of the sugarcane response that comes from breaking the cane monoculture with a grain legume. In the past a lot of that has been via a manure crop, but being able to harvest and grain crop and make money from it makes sense as well."



Bundaberg farmer Jason Loeskow inspects peanuts earlier this year.



Wilmar's Terry Morgan says the collaboration between SRA and Wilmar delivers beneficial outcomes for not just the Burdekin, but the entire industry.

## Plant breeding collaboration delivers industry-wide benefits

*The Burdekin breeding program continues to be enhanced by an ongoing collaboration in the region.*  
**By Brad Pfeffer**

A collaboration between Wilmar Sugar and SRA in the Burdekin is helping to boost the sugarcane breeding program in that region, creating flow-on benefits for the broader Australian sugarcane industry.

As is well understood in the industry, Wilmar Sugar inherited the Sucrogen breeding program when it bought Sucrogen from CSR in 2010. Prior to then, and also since, there has been increased collaboration between the SRA and Wilmar breeding programs.

Both Wilmar and SRA run independent early-stage breeding programs, where they each produce and subsequently select the best performing clones from a large number of experimental crosses of sugarcane.

These experimental crosses are a foundation of creating new varieties for the industry. Each year, thousands of them are tested to see if they have the potential to progress further through the breeding program, and perhaps one day become a new sugarcane variety.

Most of them are discarded for a range of reasons – such as disease susceptibility, or poor growth and production.

But the standout performers eventually make their way toward the Final Assessment Trial (FAT) stage, which is where the Wilmar and SRA programs formally synchronise.

According to Wilmar Sugar Technical Field Officer Terry Morgan, the collaboration boosts the performance of the overall program.

"It's like adding an overdrive to a car. Our program is a booster to the SRA effort in the Burdekin," he said.

With this collaboration already having occurred over a long period, Mr Morgan said its success was demonstrated by the dominance of Burdekin-bred varieties in the Australian industry.

Mr Morgan said the relatively small size of the Australian sugar industry meant different industry parties had to find ways to collaborate and be efficient.

FATs are conducted in five locations in the Burdekin – four are conducted by SRA and one by Wilmar. Within these trials, the performance of potential new varieties is tested under different soil types, management practices and micro-climates.



SRA Principal Researcher, Crossing and Selection, Xianming Wei, said that even though the first two stages of each program were independent, SRA and Wilmar still worked closely together for efficiency to allow for more crosses in the early stages, and subsequently more clones assessed in the final stages.

"This way, in the FATs in the Burdekin, with five trials sites, we can test about 350 clones, while before we would have been able to test 150 or so," he said.

According to Brandon-based Variety Officer, Catherine Kettle, the collaboration has doubled the number of clones that are assessed, but without any extra cost to growers. "A greater number of clones through the program means there is an increased chance of receiving a good variety," Catherine said.

Wilmar Sugar General Manager of Agriculture Ian Davies said Wilmar and SRA had a potentially promising variety called KQ08-2180 which may be released to the industry next year.

"If it makes it through the final selection process, it will be the first Wilmar bred variety to wear the new SRA variety branding codes with a WSRA prefix, replacing the more traditional KQ and MQ branding," he said.



**Photos:** A recent BPS field day showcasing varieties developed by SRA and as part of the collaboration with Wilmar, which included SRA8 and KQ08-2180.







Burdekin canegrower Chris Lyne.

## On the hunt for improved NUE options

*A background in split fertiliser application in other industries has led Burdekin canegrower Chris Lyne to investigate enhanced efficiency fertilisers. By Brad Pfeffer*

Burdekin sugarcane grower Chris Lyne has seen record-breaking yields this year, but he also knows that profitable and sustainable farming is about more than billets through the elevator.

That is why MH Premium Farms, where he manages the property, have been an enthusiastic participant in trials looking at Enhanced Efficiency Fertilisers (EEF's). The on-farm work is part of Project Catalyst and run by local private agronomy company, Farmacist.

According to Mr Lyne, there were two main driving motivations for their desire to learn more about these relatively new fertiliser products.

"First, as a business we have to be profitable, but we also need to do it sustainably, and that means looking after the environment and looking at the future," he said.

The trial is looking at products such as Entec and Agrocote in comparison to conventional urea and 2016 is the second year of the trials. The trial is in Q183<sup>0</sup> with six different treatments: 220N urea; 180N urea; 180N Entec; 180N (75 percent Agrocote, 25 percent urea); 180N (50 percent Agrocote, 50 percent urea), and zero N.

These treatments are replicated three times across the paddock.

After the first year of results, Chris said that the economics of the conventional urea versus the new generation fertiliser was comparable, but they were using less fertiliser.

"The preliminary indications are that we can reduce our fertiliser from 220 units of N down to 180 units and still get the same yield," he said.

"The cost is then the same because although the Entec is more expensive, the reduction in fertiliser makes up the difference. Economically we are neutral, but environmentally we are putting on 40 units less of nitrogen."

He said the investigation was about environmental responsibility, and also about being conscious of other issues such as regulation around water quality.

Mr Lyne was also tempted to investigate the enhanced fertilisers after his experience in the cotton industry. Having split nitrogen applications in the past for that crop, as per normal practice, he was keen to investigate options for sugarcane.

The size of cane and its rapid growth created challenges that eventually led him to controlled-release fertilisers as a path for investigation, rather than split application.



SRA is currently investing in several research activities that are looking at controlled-release fertilisers.

This research is assessing whether these products can reduce nitrogen losses such as those occurring through runoff, into the atmosphere, or through leaching.

A crucial aspect of ensuring the products could provide value is matching the release of the fertiliser to the needs of the crop.

Given that EEF's are generally more expensive than traditional fertiliser, the research is targeting the question "where and when will they make a difference?".

In addition, a number of other trials and research is occurring across the industry.

Jayson Dowie with Farmacist said that Chris's trial was one of a series of 12 that is in place across the Burdekin across different soil types – four on sand, four on loam, and four on clays – and different fertiliser application times through the harvest season. "Soil type and timing of application such as early, mid or late can have different outcomes on lost pathways," Jayson said.

Back on farm at Ayr, and Chris Lyne also takes a proactive approach to the farming system for the 500 hectares of cane production.

They run a controlled-traffic system and usually plant soybeans at the end of the crop cycle.

"We irrigate after the harvester has been through, followed by a bed renovator to flatten the top, and a ripper machine through the middle of the bed," he said.

"We then plant soybeans on the side of the bed and harvest for grain at the end of May or early April. Hopefully there is still plenty of moisture in the bed and we will go through with the same bed renovator and then plant cane straight into that."

Blocks are soil tested at the end of the soybeans ahead of the next crop cycle. Cane yields this year have been as high as 210t/ha for plant cane KQ228<sup>®</sup>, along with first ratoon of 176t/ha and second at 160t/ha, all of the same variety.

"And it has all been going mill average sugar, so it is pleasing to see we are not substituting tonnes for sugar and that we are still getting good results."

They grow between 40-50 percent KQ228<sup>®</sup>, with other varieties including Q208<sup>®</sup> and Q183<sup>®</sup>, as well as recently planting a large paddock of Q240<sup>®</sup>.



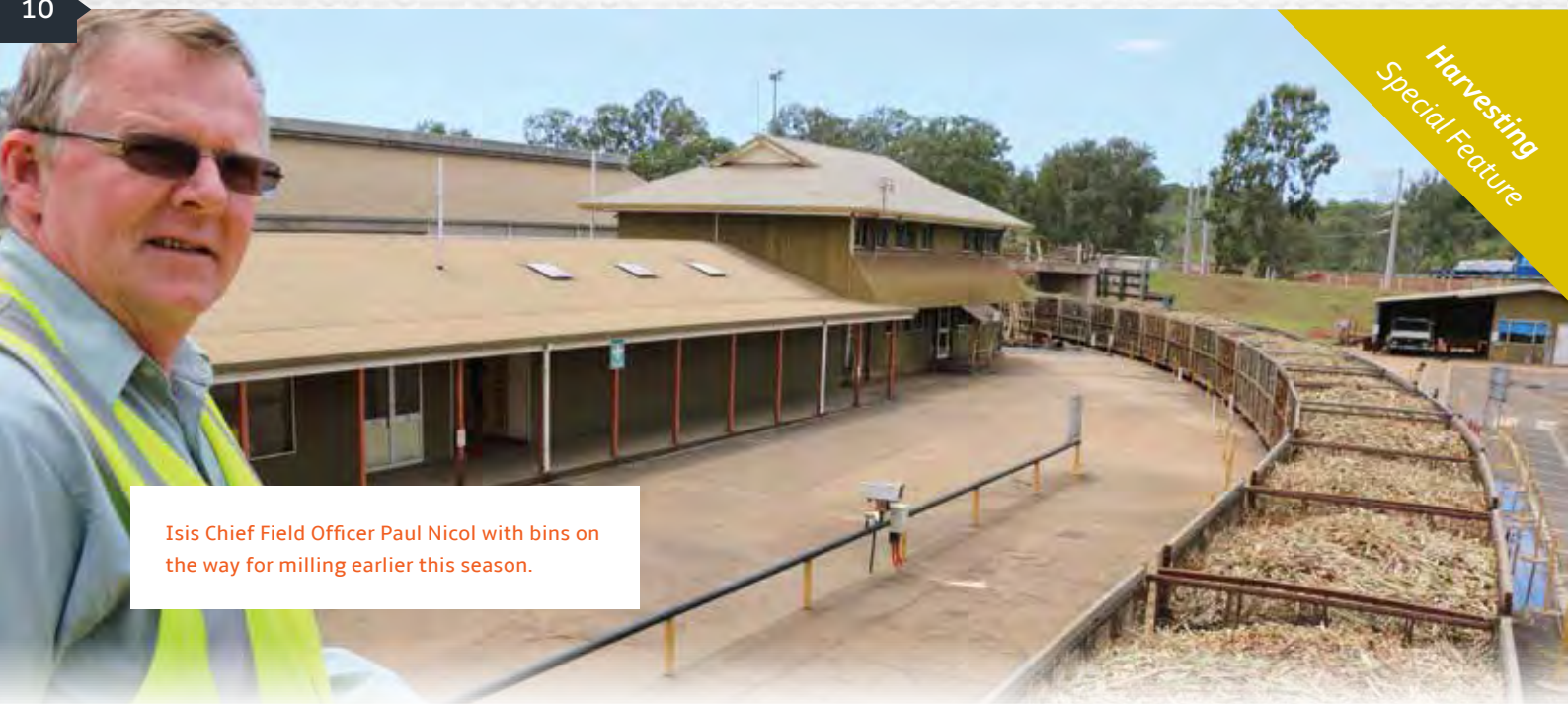
**Left:** The flumes that measure N loss through the irrigation events on the farm.

**Below left:** An aerial view of the trial site.

**Below right:** Preparing for the trial.

*Photos courtesy of Farmacist.*





Isis Chief Field Officer Paul Nicol with bins on the way for milling earlier this season.

## RESEARCH

## CLEAN team improving harvest efficiency at Isis

*A collaborative effort between the mill, growers, harvester operators and researchers is delivering productivity and profitability outcomes for the local industry at Isis. By Brad Pfeiffer*

Isis mill Chief Field Officer Paul Nicol knows that improving sugarcane harvesting efficiency is a big mountain to climb.

But after two seasons of identifying and quantifying the challenge and making improvements, he can see progress through the collaborative work that has occurred with the mill, growers, contractors, and drivers.

The results of this work were apparent in week 10 this year when a rake of bins entered the mill via one group that had instigated a number of changes to its harvesting practices. The result was a dramatic increase in quality that Paul said was a direct result of change in practice that had been made by that harvesting group.

The recent work on improving harvest efficiency at Isis began when the mill decided it needed to step back and assess the true quality of the cane supply.

"I looked at the bins go past each day and the cane still looked okay to me," Paul said. "But we were also noticing small things like shredder hammers needed replacing a day earlier than expected. Normally we would get through 90,000 tonnes before replacing them, then say 81,000t, or 78,000t, so that suggested there was a problem."

Extraneous matter levels had increased steadily over the years from about 7 percent to 15 percent.

To see it for themselves, they pulled apart an average cane bin during the 2015 season, and the result was 14 percent EM and 790kg of the total 5610kg having no value for making sugar.

They also took part in a number of SRA demonstrations with the in-field sucrose loss measurement system (ISMS), also known as the sugar loss trailer (see page 13).

"The trailer gives us hard data on losses," he said. "But it also lets you clearly see evidence of the losses – there was juice dripping at the back of the harvester, the trash was sticky, and the primary and secondary extractor fans had little rings of sugar."

"So by the time we added the 14-15 percent EM to the 20TCH being lost in the field, it was easy to come up a figure of people losing \$1000 per hectare. For us as a grower, as a miller, and a transporter, we saw that there was cane there that we wanted."

Paul said the focus was on collaboration between all parties, and direct engagement with the harvesting contractors and drivers. "Everyone's involvement in the bin dissection has now evolved into what we call the CLEAN team, which involves all contractors and growers and has the goal of decreasing EM, reducing losses, and increasing income for the value chain."



CANE quality improves – increase income for all stakeholders

LOSS of TCH and CCS minimised, bin weight maintained

EXTRANEOUS matter levels below 7.5%

ANSWERS how is the pie divided – who pays and what modifications need to occur?

NORMALISED return to acceptable standards <7.5% EM and cane loss

Increase  
income  
\$

Reduce  
losses

Decrease  
Extraneous  
Matter

The results of Dicanna harvesting's efforts – bins entering the mill (see page 12).



# Practice changes add up to significant efficiency gains



*The Russo family at Isis is seeing big improvements to their harvesting efficiency this season after introducing a number of changes.*

Childers harvesting contractor Michael Russo is pleased to see big improvements to cane quality and harvesting efficiency from a series of measures that have been introduced by the Dicanna harvesting group in 2016.

For Michael, spokesperson for the Russo family's Dicanna Harvesting, he first saw the need to make improvements after reading the SRA Harvesting Best Practice Manual and seeing the dissection of a bin at the Isis mill.

"That was the moment when we knew that we had to look at changes we could make with the machine, and the driver, whether they be things that cost money or not," Michael said.

Last year, their average ground speed was 8.5km/hour and in 2016 it is now under 6.5km/hour. They have also switched to five-blade EHS chopper drums, are aiming to optimise fan-speed in relation to ground speed, as well as more frequently changing their chopper knives.

At the end of the season, he will be comparing the group's CCS to the last four years to provide economic data.

Already though it is clear that they are getting results that are backed up by SRA demonstration trials conducted in the region and across the industry.

Both Michael and Paul Nicol believe that there is value in the new online harvesting tool, SCHLOT, in helping to set baselines for harvesting practice and determining the extra value that could be created through improved practice.

Michael said the next hurdle would be in striking the right payment system, but the region was already taking the first step by identifying the losses.

"We are working on hard economic data so that we can show that there is a piece of the pie for the whole value chain," Michael said.

"When cane prices are good, this is the perfect opportunity to make change. If we can do it now, when there are lean years in the future, then the industry will be a long way in front."

The CLEAN team is focused on collaboration and people helping people. One example from this season is work with one small harvesting group that was able to make small changes that resulted in overnight improvements in cane quality and cost savings.

The group was using a 1993 model harvester, and with a relatively small investment of less than about \$5000, they immediately saw a 0.69 increase in CCS.

"It also increased bin weight and reduced trips to the siding by 24 per week, so we are talking about gains that paid for themselves in just one week," Paul Nicol said.

SRA Adoption Group Leader, James Ogden-Brown, is based in the southern region and said that harvest losses had been identified as a priority for SRA investment and activity in the region.

"The region is looking for proof of concept regarding harvest losses. Paul and the team at Isis took the bull by the horns in dissecting the bin, and SRA has added to that through a number of demonstration trials and other activities.

"They are showing that by working together, we can achieve a positive result."

**Above:** Harvesting contractor Michael Russo says he is pleased with the results of a number of changes he has made this harvesting season.



1

Samples containing trash, billets, juice and tops are collected from a measured tarped area.

2

This is then weighed to calculate total tonnes per hectare of residue.

3

The field residue is mulched and processed.



## The in-field sucrose loss measurement system (ISMS)

*The ISMS trailer is a mobile system to measure harvesting losses in the paddock that can provide fast and accurate information to the industry. Both Wilmar sugar and Mackay Area Productivity Services (MAPS) have invested in the trailers, and are an integral part of SRA's demonstration trials into harvesting efficiency. The process is described from steps 1-5.*



4

The samples are then combined with water blended and pressed on a 9 tonne carver press to obtain a liquid extract that can be analysed for sugar content through a Brix refractometer.



5

From this information, tonnes of sugar and cane per hectare as well as dollars per hectare can be calculated from different harvester configurations.

# On-ground work demonstrates harvesting efficiency at a regional level

*SRA demonstration trials are continuing across the Australian industry, delivering information according to local requirements and helping to optimise harvesting efficiency.*

A series of demonstration trials over recent seasons are providing the Australian sugarcane industry with vital information around sugarcane harvest efficiency.

These trials are seeing SRA collaborate with local harvesting groups, milling companies, and growers to analyse different harvester configurations and aspects of efficient harvesting.

Within each region, each trial is formulated in direct response to local industry requirements for information, and includes aspects such as ground speed, fan speed, pour rate, crop conditions and new technology such as EHS chopper drums.

For example, a recent trial at Condong in NSW had a strong emphasis on providing the local industry with information around the reduced losses associated with EHS chopper drums.

SRA Adoption Officer Phil Patane (Ingham) and Technician Luke Giddy (Brandon) have been conducting the trials with the help of local industry, and Phil said the results provided practical and useful information that could help improve harvest efficiency.

The Condong trials saw two identical John Deere 3520 harvesters operating within the one 700-tonne paddock (managed by David Bartlett), with one harvester having standard drums and the other the EHS drums.

The trial gathered information on juice left on trash, as well as billet length, billet quality, and extraneous matter measurements.

The result was useful information around tonnes of sugar left in the paddock as well data around tonnes of cane per hectare and CCS.

"We have conducted three of these trials in 2014, two in 2015, and another four in 2016," Phil said. "The first one in Queensland showed a 32 percent reduction in juice on trash via the EHS drums, as well as 10 percent more sound billets and 7 percent fewer mutilated billets.

"The EHS drum is new technology and previous trials have shown a reduction of juice on trash due to the geometry of the drums, which has a larger gap. Instead of a 76mm gap it has a 106mm gap, and we are not seeing the squishing effect on the end.

"This trial, and a stationary conveyer belt trial in the Herbert in October, are providing more information in addition to what we gathered in 2014 and 2015.



"Having demonstration trials gives growers and millers an opportunity to come out and see how SRA conduct harvesting," Phil said.

"The harvester is very good at hiding the evidence of sugar loss, so there is a huge value in each region observing how we measure cane and sugar loss in the paddock."

Other demonstration trials this season have also looked at issues such as ground speed and fan speed. One trial at Bundaberg showed a stark difference between a 700 rpm fan speed at 6.5km/hour compared to 850rpm at 8km/hour.

#### More information

**Phil Patane**

(07) 4776 8202

ppatane@sugarresearch.com.au

Billet quality	EHS	Standard
Sound	72.4%	62.3%
Damaged	27.5%	30.7%
Mutilated	0.1%	7%

**Above:** Example of results from one of the recent EHS chopper drum demonstration trials.

Treatment	Fan-speed (rpm)	Ground speed (km/hr)	Trash in field (t/ha)	Sugar loss in paddock (t/ha)	CCS delivered cane	Delivered cane (TCH)	Harvesting operations		CST operations		Revenue	
							Time to harvest (hr/ha)	Haulout trips to siding	Average cane bin weight (t/bin)	No of cane bins required (bin/ha)	Value of sugar left in paddock (\$/ha)	Value of sugar delivered (\$/ha)
T1	850	8.0	30.5	2.26	16.03	108	1.05	9	5.62	20	\$1,017	\$6,866
T2	700	8.0	22.2	1.21	16.03	121	1.05	11	5.16	24	\$544	\$7,701
T3	700	6.5	22.3	1.13	16.27	123	1.23	11	5.44	23	\$511	\$7,957

**Above:** Information from recent SRA demonstration trials.



One of the demonstration trials in action at Condong, NSW, in October.

New research is looking at the potential for by-products of sugarcane to be harnessed for high value animal feeds.

#### Project details

##### Key Focus Area:

Product diversification and value addition

##### Project name

Biorefineries for higher-value animal feed, chemicals, and fuels

##### Project number

2015/902

##### Project end date

01/04/2019

## Harnessing cane's potential for animal feed

*New value-adding research is looking at capturing the value of the sugarcane biomass and putting this into the context of other important competitive advantages that currently exist for the Australian sugarcane industry.*

When sugarcane growers and millers talk about animal feed, the first thought is typically molasses.

But a major new research project is looking beyond molasses and investigating other possibilities for turning sugarcane by-products into animal feeds and feed-additives.

The research is part of the major Commonwealth Government Rural R&D for Profit Programme as part of a project called *A profitable future for Australian agriculture: bio-refineries for higher-value animal feed, chemicals and fuel*.

Other aspects of the project are investigating other potential value-add products that can be created from sugarcane by-products, as well as by-products from other industries such as cotton and forestry.

SRA is the lead agency for the project with funding from the Australian Government Department of Agriculture, along with Forest and Wood Products Australia Limited, the Cotton Research and Development Corporation, Australian Pork Limited, and the Queensland Government Department of Agriculture and Fisheries.

Queensland University of Technology (QUT) is leading the research with support from NSW Department of Primary Industries and Southern Oil Refining.

One of the goals of the project is to look at each product from a sugar mill and develop chemical and biological tools that could be used to turn these products into animal feed products.

The project is focused on feed products for the pork industry, but is also looking closely at the beef industry because of the potential benefits that the cane and beef industries share through their proximity.

Dr Mark Harrison from QUT's Centre for Tropical Crops and Biocommodities is leading this part of the project and he said tremendous potential already exists within sugar mills.

"With sugarcane we have a cropping system that functions quite differently to other crop industries," he explained.

"We produce a huge amount of plant biomass and transport a large amount of it to a central processing facility, while other industries such as grains are leaving a lot of their biomass in the paddock."



"The coastal location of sugar mills is important because it puts sugarcane production and processing close to many of the beef feedlots in both Queensland and NSW.

"The higher rainfall environment also means that the industry is producing biomass during the winter, which is a time when it is typically drier in western grazing country and there is an increased need for stock feed.

"We are also seeing cattle production in Queensland developing more sophisticated supply chains where cattle from west of the Divide are trucked to feedlots closer to the coast, which is also where sugar mills are located."

The project is investigating five main avenues to create animal feed products from sugarcane:

### 1. Leaf protein

It is already well-understood that any plant leaf contains protein, and that there are existing (but expensive) processes that can extract this protein and could create a feed protein product.

"With this research, we are investigating if there are new methods that could be used at scale to isolate that leaf protein and create an enriched protein product that could go into animal feed," Dr Harrison said. "There seems to be increasing interest in whole-crop harvesting, so this could be an opportunity to bring in green leaf and tops to send into one revenue stream, and send the billets in another direction."

### 2. Plant-derived bio-actives

Bio-actives for human consumption have become a growing trend in recent decades and have extended beyond the market of inner city urbanites to underpin the growth of a multi-million dollar 'nutraceutical' industry.

"We gain a lot of health benefits by having anti-oxidants in our diet," he said. "And just like us, pigs are one-stomach animals, so we are investigating these products to enhance their health. As part of that we are looking at both traditional and cutting-edge extraction technology that may be able to isolate some of these compounds for animals."

### 3. Improved digestibility

Bagasse is a very low quality cattle feed. It has been estimated that once bagasse constitutes more than 5 percent of a ration then cattle weight gain becomes limited. But can things be done to the bagasse to make it more digestible? This part of the project is looking at two approaches to improving the digestibility.

The first is through high temperature treatments, and the second through 'chemical ensilage', a process where an agent is added to the bagasse and it is allowed to sit at room temperature for a period of time. "We have proof of concept from previous research, but we want to find the most economical way to do it."

### 4. Liquid sugar products

The researchers are also investigating liquid sugar products other than molasses, such as converting bagasse into a liquid sugar syrup. This research is asking questions such as: what treatments would need to be used? What treatments would work best? How much energy would be in the product?

"We are using advanced analytical techniques to identify what is in the liquid sugar syrups. We need to be certain that these products don't contain compounds that actually inhibit the ability of an animal to take up nutrients from their feed."

This research is possible thanks to multi-million dollar investment that has been made previously by QUT in a Central Analytical Research Facility with both cutting-edge equipment and the skilled staff to both maintain and operate it.

### 5. Solid-state fermentation

Different types of yeasts and fungi are already fed to animals, and this part of the project is investigating if these micro-organisms can be grown safely from the residue of cane production, with a focus on improving the protein content.

If those micro-organisms can also produce fats and oils, as well as protein, then the research project (as a whole) is moving another step closer to producing everything that we need to produce a complete animal feed from sugarcane by-products.

### Conclusion

Dr Harrison said that this research project was about creating a new revenue stream and helping to improve industry profitability.

"A sugar mill is not necessarily going to become a formulator of stock feeds, but they could be a supplier of valuable ingredients that go into a feed," he said.

"Fibre is an important part of animal diets and cane factories have a lot of fibre. So we are looking at: what can we do to it to ensure that the nutritional value is improved.

"At the end of the day this is about helping the industry to make money."



**Australian Government**  
Department of Agriculture  
and Water Resources

This project is supported by funding from the Australian Government Department of Agriculture as part of its Rural R&D for Profit programme.

*SRA acknowledges the funding contribution from the Queensland Department of Agriculture and Fisheries towards this research activity.*

### More information

**Dr Mark Harrison, QUT**  
(07) 3138 1234

Rocky Point grower and SRA  
Delegate, Greg Zipf.

## Solid yields and sugar for Rocky Point growers

*Two good crops in 2015 and 2016 are showing the performance of sugarcane varieties for Rocky Point cane growers, although the region has had challenges in harvesting the crop.*

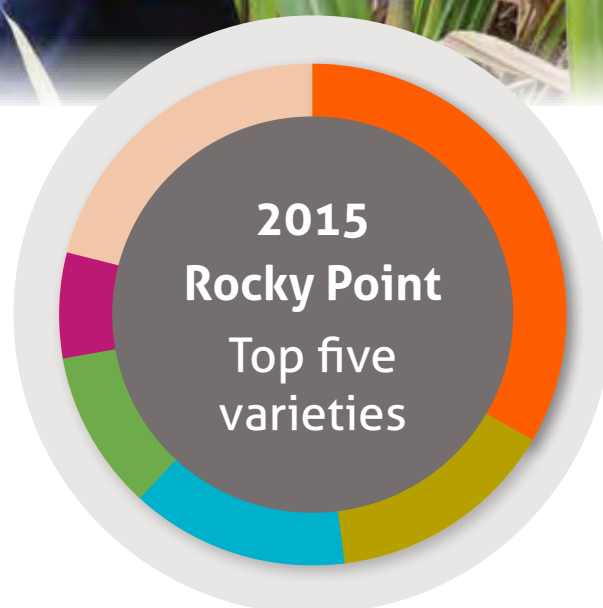
In 2015, Rocky Point cane growers harvested their largest crop in over a decade both in total tonnes and tonnes of cane per hectare (TCH).

In the boxed-in region between the urban sprawl of Brisbane and the Gold Coast, the region harvested 384,000 tonne of cane last year at an average of 102 TCH.

This included about 25 percent of the area being two-year old standover. Nevertheless, the plant cane average was still slightly above 100 TCH and ratoon crops averaged 98TCH.

According to local grower, Greg Zipf, there have been a number of standout varieties that had made a positive contribution to the region.

"One of the main varieties here over a number of years now has been Q232<sup>®</sup>, which last year produced 114 TCH and 15.3 tonnes of sugar per hectare (TSH)," Greg said. "KQ228<sup>®</sup> is still popular, with 106TCH and 14.7 TSH.



Variety	%
Q232 <sup>®</sup>	34%
Q208 <sup>®</sup>	14%
KQ228 <sup>®</sup>	13%
Q240 <sup>®</sup>	11%
Q138	7%
Other varieties	21%



He said there was small amounts of SRA1<sup>®</sup> and SRA2<sup>®</sup> being planted, and while they looked good, very little commercial cane had been harvested to provide a growers' assessment on these varieties.

"There are a couple of other varieties where the jury is still out, such as Q252<sup>®</sup>. Q248<sup>®</sup> is one that we are not happy with at this stage, and Q245<sup>®</sup> is one that it is still a bit early to say whether it will be a goer here or not."

Greg said the crop in the ground this year got off to a shaky start with dry December and January weather, but a change in the season meant that it looks as good as or better than last year, on those blocks cut prior the end of October 15.

However, with a late start to crushing, there are several unknowns for the local industry.

Considering these challenges, Greg said that the region now considered that harvesting 50 percent of the crop would be a good outcome.

Sunshine Sugar has assisted with crushing last year's standover cane through the Condong Mill in NSW.

Depending on the season length at Condong, Mr Zipf said there had been discussions occurring about sending Rocky Point cane to Condong once it finished crushing its own cane.

Because of all those factors, Greg said this year was a "survival year".

"Getting half of the crop off now will be a best case scenario now, unfortunately," Greg said.

"The long range forecast is suggesting that we will get average to above average rainfall in the southeast corner, so it also really depends on whether that rain falls on top of us or not."

With the harvest started, Greg said strategic harvesting of blocks would be crucial.

"At Rocky Point there is no problem with standing crops over, and we historically nearly double our tonnes. We know that there will be issues with heavier crops and varieties like Q242<sup>®</sup> where there is risk that there will be dead sticks and impacts on CCS next year.

"So our focus will be on the heavier crops and varieties like Q232<sup>®</sup> where we have started to see flowering early.

"The good news is that people are still planting and most are continuing to do that. Despite the challenges we know it is crucial to get those plants in the ground for future years."

Rocky Point cane awaiting harvest in 2016.





Dr Anthony Young with the Centre for Crop Health, USQ, at the Indonesian Sugar Research Institute.

## Tracing the origins of ratoon stunting disease (RSD) of sugarcane

*Senior Research Fellow, Centre for Crop Health, University of Southern Queensland, Anthony Young, used an SRA Travel and Learning Award to visit the Indonesian Sugar Research Institute (ISRI), East Java, in August 2016.*

Ratoon stunting disease (RSD) has caused untold yield losses to the sugar industries of Australia and the world for at least 70 years.

It is spread by harvesting and planting and, unlike most diseases, it has no clear symptoms, making it difficult to tell whether a crop is infected.

In fact, it was only discovered in 1945 when a field of Q28 growing in Mackay was inadvertently planted using diseased seed on one side and healthy seed on the other, and the marked differences in crop size raised suspicions.

When it was found that diseased Q28 could infect healthy Q28, and that other varieties were infected, it was clear that a previously unknown disease was present.

The alarm bells rang soon after diseased cane was found in quarantine: whatever it was, it was widespread, and had apparently been around for a considerable period of time. But where did it come from?

Dr Anthony Young from the Centre for Crop Health, University of Southern Queensland, has been on the case of RSD for many years, from his cane-farming upbringing, his PhD studies, and work as an Extension Officer in the NSW sugar industry. In August, he travelled to the Indonesian Sugar Research Institute (ISRI), East Java, to see if he could trace the origins of the disease.

"It's clear that RSD could not have come from the home of sugarcane, New Guinea, as it has only recently been introduced there," he said. "But the bacterium that causes the disease is

highly adapted to living in the veins of sugarcane, so it's likely it was originally present in one of the wild relatives of cane."

Which brings him to Java.

"Faced with diseases that were wiping out production, the Dutch breeders, at the ISRI site I visited, crossed commercial canes with wild canes to generate hybrids that were resistant to the major diseases. These hybrids were distributed throughout the world's sugar industries where they were grown commercially and used for breeding."

"There's probably no commercial variety growing today that can't trace its ancestry to a series of crosses made in Java in 1921. This presents the perfect pathway for a new disease to enter into the world's industries."



The key to identifying the origin of RSD lay in detecting bacterial strains from which the strain that causes RSD could have come from. So using the LSB-PCR technique, Dr Young and the ISRI team tested a range of wild canes and commercial seedbeds to find out if related strains were present. The results surprised them.

"We found evidence for the presence of different strains, but most of them are very closely related to new strains we've found in Australia. We don't know where they come from, whether they cause a disease, or how they interact with the plant. We also found upwards of 50 percent RSD infection in the seedbeds, so there's scope to make marked yield improvements if we sort out RSD."

The Java trip was also an excellent opportunity for Anthony to see how cane is grown in one of our nearest neighbours and to interact with strategic partners.

"My Indonesian colleagues could not have been more welcoming. It's a very different way to grow cane and it gives one a new appreciation for the challenges facing worldwide agriculture."

Dr Young hopes that by tracing the origins of RSD, we will get a better understanding of how the disease works, and potentially identify sources of resistance that can be used to improve RSD control in Australia.

"We know from experience that we get massive yield increases if we control RSD by uptake of clean seed. Unfortunately, as the disease can be harvester transmitted, fields tend to pick up the disease, which limits the number and quality of ratoon crops that can be achieved. If we knock RSD on the head by using resistant varieties, we'll enjoy industry-wide productivity gains, allowing our industry to then focus on solving the other issues we face."

And the next steps? Dr Young hopes to further his work characterising the new strains, and hasn't given up on his quest to solve the RSD riddle.

"SRA have supported my work on this disease and, with the support of the stakeholders throughout the industry and collaboration with partners at Southern Cross University, we've made excellent progress. Hopefully we'll see some massive yield gains in future years."

**Below (inset):** In the field sampling for RSD in Indonesia.

**Below:** Using clean-seed cane has been useful in controlling RSD. Disease-free seed is produced for distribution to farmers by repeatedly hotwater treating (50°C for 3 hours).







## Strategic approach delivers long-lasting benefits for grub control

*Soon to retire from sugarcane research and management, Dr Peter Allsopp leaves a strong legacy that has delivered multiple benefits to Australian sugarcane growers and millers. By Amy Claireton*

Cast your mind back to the mid-1990s and think about canegrubs. No doubt one name will come immediately to mind as the entomologist who led the research, development and extension program to address the widespread problem of crop losses due to ineffective grub control.

Dr Peter Allsopp was based in Bundaberg at the time and led the work to unravel the problem and identify effective management strategies for growers to implement.

Taking a three-prong approach to the problem, Peter and his team first investigated whether the poor control in the field was due to chemical product failure, insecticide resistance, or inefficient application practice.

The second priority was to investigate and test alternative control options and the third priority was to identify the farming practices that had allowed canegrub populations to proliferate so successfully.

This work led to a number of significant outcomes for the sugar industry and provided relief for a great number of farm businesses. Initially growers were able to successfully use the fungal pathogen *Metarhizium* to help control canegrub larvae. The research also investigated the potential value of transgenic sugarcane that was resistant to canegrub feeding.

Probably the most significant outcome was from the work relating to investigations within farming systems to determine what practices were favouring canegrub populations.

The team's work led to new ways to identify the different species of canegrub affecting sugarcane crops and growers gained a better appreciation of the differences in behaviour among the 19 different species.

What became evident was that the two main species, greyback canegrub and Childers canegrub, were quite different and that these differences had an impact on the effectiveness of different control strategies.

The team found that plough-out replant practice allowed numbers of those canegrubs with two-year lifecycles to build up.



For greyback canegrubs it was apparent that cane height at the beetle's flying time affected the flight and egg-laying preference, and that it was beneficial to harvest a block early if it was due for plough-out in the following season.

In northern cane production areas this strategy helped reduce the number of greyback canegrubs present in plant-cane blocks, but it didn't work in the southern growing regions with Childers canegrubs.

Further investigations showed that populations of Childers canegrubs, more prevalent in the southern regions, did not move far from year to year.

Female beetles particularly tended to remain within the same block, meaning that monitoring was very important to identify the presence of grubs in a block.

This early work on field identification, monitoring and control tactics would go on to form the basis of the industry's very-successful GrubPlan program.

This overview of Peter's contribution to the industry's knowledge and understanding of canegrub species and their management highlights the value of dedicated researchers and their resolve to understand the cause of insect

pest invasions and to provide growers with practical strategies to minimise crop damage.

Peter moved into senior management roles within SRA (then BSES) in the early 2000s and has continued to make important contributions to the industry's preparedness for pest and disease incursions.

In addition to the risk of exotic species such as stem borers, Peter has managed research into risks such as insecticide resistance and minimising pesticide levels in runoff water.

He has held leadership roles in the scientific community and been widely recognised for his contribution and service to the sugarcane industry.

In 2001, The University of Queensland recognised his 'substantial, original and distinguished contribution to the field of agricultural science' by conferring the highest award degree of Doctor of Agricultural Science.

As he prepares to retire from his role with SRA, Peter is pleased to have important entomological research underway to continue the search for effective and reliable parasitic control of canegrubs, develop improved

risk assessment tools for growers and investigate alternative insecticide options that do not pose a threat to off-shore environments.

Having been involved in the management of the sugarcane smut outbreak Peter is well aware of the value of being prepared for such circumstances and having a biosecurity response plan in place.

His career as a research entomologist started in the Queensland Department of Primary Industries where he worked in a variety of crops. He has found that this broader knowledge and understanding of farming systems provided a firm foundation for his research work and helped him focus on the development of practical and effective management strategies for growers to implement.

He has also enjoyed the opportunities provided in management roles to encourage students and enable career researchers to 'do their best work'.

His rational and calm approach to managing a broad research program and the researchers undertaking the work has earned Peter considerable respect amongst growers and colleagues alike.



**Opposite:** Peter Allsopp with Herbert district cane grower Michael Pisano discuss improvements to the Herbert breeding program enacted in 2015.

**Left:** Peter Allsopp in the field.



### Project details

#### Key Focus Area:

Optimally adapted varieties,  
plant breeding and release

#### Project name

Optimising productivity, variety  
recommendations and mill  
operations through analysis of  
mill data

#### Project number

2016/032

#### Chief investigator

Dr Jo Stringer

## Collaborative use of mill data creates path for productivity improvement

*SRA has worked collaboratively with Wilmar and HCSPL in the Herbert region to analyse mill data to drive productivity improvements.*

Research that has analysed mill data to help improve productivity in the Herbert region is being extended across the Australian sugarcane industry.

Over the last two years, the Herbert research project has looked at a range of characteristics of both high-yielding farms and low yielding farms in the Herbert, as well as comparing the differences.

It has analysed farms according to factors such as overall production (tonnes) in terms of small, medium and large business, with the aim of identifying steps that growers can take to boost their productivity.

This has been with the objective of answering the question – what are the farm practices occurring on high yielding farms compared to low yielding farms?

SRA Leader for Data Analysis, Dr Jo Stringer, said the project looked at vast volumes of data on the Herbert industry, with all individual information being confidential and only available to that grower or harvesting contractor.

The work occurred in collaboration with Wilmar and Herbert Cane Productivity Services Limited (HCPSL).

“We know that there are small farm size high-producing growers, and there are also small farm size low-producing growers. Our project looked at what practices are the high producers implementing to make them high producing,” Jo said.

“Is it their *Pachymetra* level and use of clean seed? Is it their soil type? Is it the timing of their farming practices?”

Industry in the Herbert has initiated a program called Target 85, a program targeting an average district yield of 85 TCH.

It appears that the region is likely to meet that yield target in 2016, and this project has identified a number of practices that could help the region continue to meet that target even when seasonal conditions are less favourable, via long-term extension programs.

Jo said the project identified common practices across top performing farms.

“We know soil and climate play an important role, but there was a number of practices that were common across the high yielding farms,” she said.



"A major finding was that growers who have adopted the modern farming system had significantly higher productivity than those who used traditional practices.

"The impact of *Pachymetra* was also apparent, suggesting incorrect variety selection may also be a factor contributing to poor ratooning."

She also said the project identified the value of clean seed in the region, which had translated into a huge demand from hot-water treated cane from HCPSL since the project began.

"Growers who regularly obtained clean seed had 10 percent or greater yields than growers who never or infrequently obtained clean seed."

According to Manager of HCPSL, Lawrence Di Bella, many more growers now undertake *Pachymetra* screening and want to source *Pachymetra* resistant varieties from HCPSL approved clean seed plots.

Over the last two years, HCPSL has distributed between 800-1200 tonne of cane as whole stalks and billets out of clean seed plots, compared to 200t previously.

There have been group extension and one-on-one extension activities as a result of this project, as a collaboration between SRA, HCPSL, and Wilmar. This extension activity has been targeted to the different groups of growers.

The project also collaborated with Norris ECT to identify the impact of harvesting practices in relation to productivity.

The work by both NorrisECT, SRA engineering, Wilmar and many other milling companies has demonstrated significant improvements in crop recovery and quality associated with reduced harvesting speeds.

The research is now being extended across the industry, working in collaboration with millers and productivity services companies.

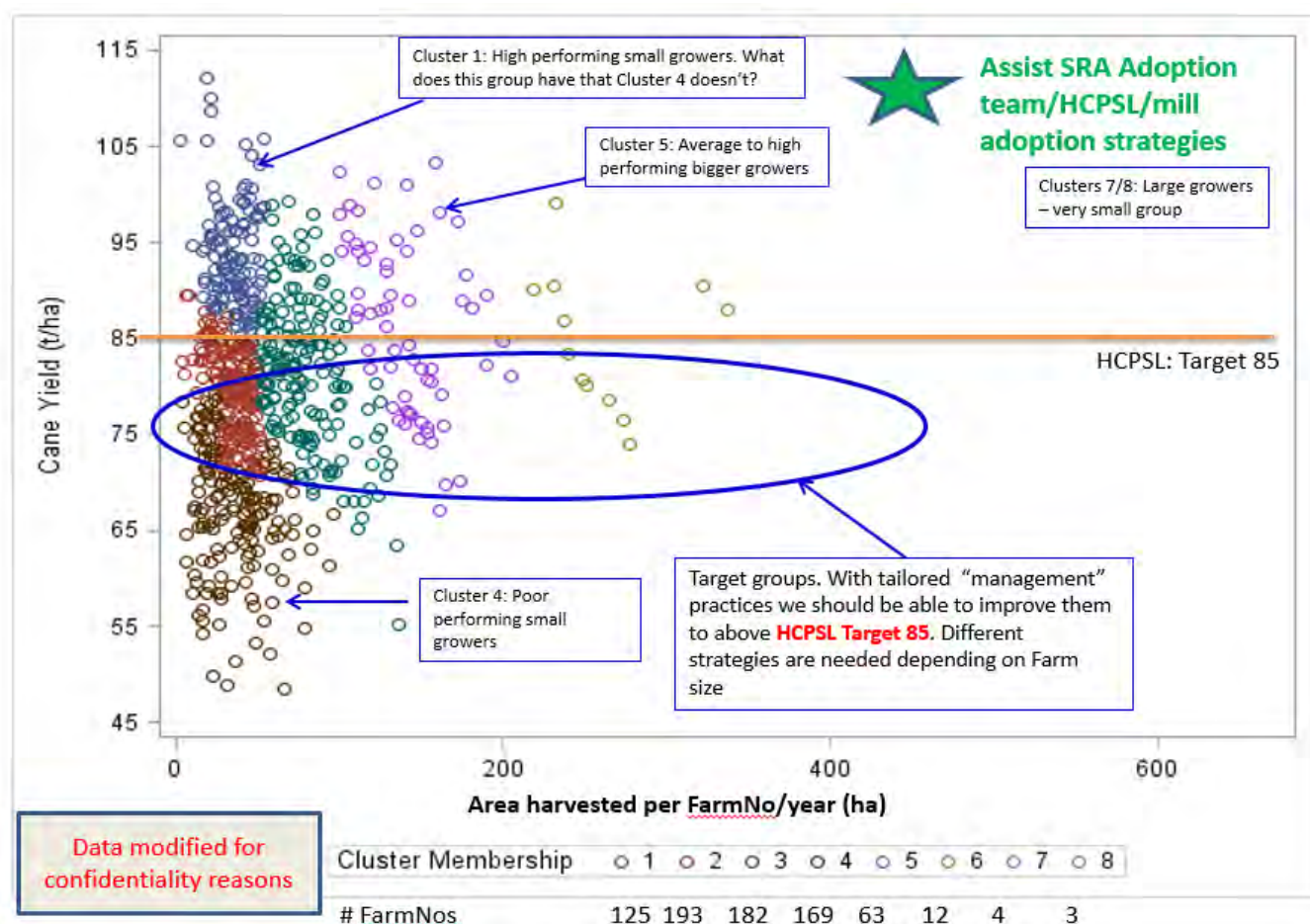
#### More information

**Dr Jo Stringer**

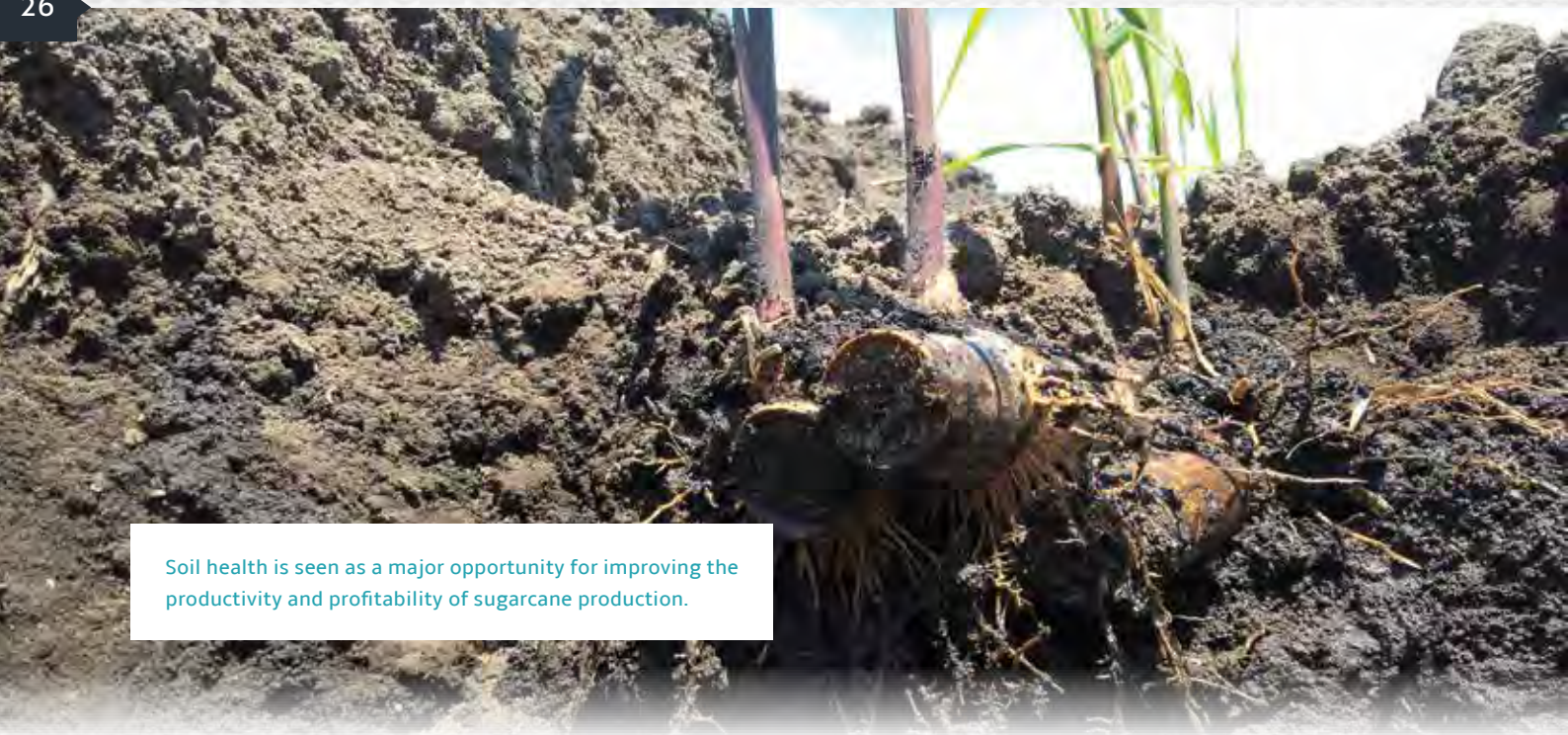
(07) 3331 3337

[jstringer@sugarresearch.com.au](mailto:jstringer@sugarresearch.com.au)

**Below: Performance of 8 clusters over time: TCH.**



SRA acknowledges the funding contribution from the Queensland Department of Agriculture and Fisheries towards this research activity.



Soil health is seen as a major opportunity for improving the productivity and profitability of sugarcane production.

## Mastering your soils for greater productivity and profitability

*A series of workshops is delving deep into the soil to provide practical information on soil health to farmers.*  
**By Sebastian Garcia-Cuenca, Adoption Officer, Condong**

In recent times our knowledge, understanding and interest in soil biology and the impact of management on soil organisms has increased.

In the past we focussed almost entirely on root pests and pathogens, while we now know that nurturing the beneficial organisms that also occur in soil is not only the way to enhance root and soil health, but is also the foundation of profitable and sustainable land management.

The sugar industry is regularly highlighting its growing concern about the health of its soils.

Growers interviewed as part of a 2016 SRA Grower Survey saw better soil management as one of the main options for improving productivity and profitability over the next five years.

This year many growers have attended a BMP soil health workshop, participated in, visited or read about soil health research trials, demonstration projects or neighbours doing something different in their paddocks.

We have heard, told and asked about soil physics, chemistry and biology under various conditions, but we understand that there is more to learn, and practices to implement to improve soil health.

Farmers who are making changes to improve soil health on their farms are seeing some positive results.

As part of SRA-funded research looking at the impact of a balanced and diverse soil food web on soil health, Dr Graham Stirling has been investigating the relationship of key farming system components (including minimum tillage, trash blanketing, legume fallow and controlled traffic) to the incidence of soilborne pests and pathogens.

Dr Stirling cautions that while the new farming system's components are critical to improve soil health, they don't provide immediate benefits.

"It takes time and patience to improve soil biology and the general health of the soil," he said.

His research also shows that increasing soil organic matter levels is the key to reducing pathogen loads and ultimately restoring the health of sugarcane soils and root systems.

"Organic matter is the energy source that fuels the soil food web. Without it, pest and pathogen-suppressing soil organisms – mainly fungi, bacteria, nematodes and microarthropods – cannot function and are simply absent or in very low numbers. Consequently, sugarcane soils are largely dominated by pathogens and plant parasitic nematodes."



Importantly, Dr Stirling believes that while growers are generally aware of the physical and chemical factors that limit the productivity of their soils; the role of soil microbes, flora, fauna and overall soil ecology is more mysterious.

Starting early 2017, Dr Stirling, assisted by a range of experts including growers such as Ashley Peterson, will offer hands-on masterclasses focusing on soil biology.

These practical and interactive workshops will give growers and advisors the opportunity to see these microscopic creatures and learn about their impacts on soil, roots and crop health.

Farmers will also be assisted in developing practical, long term action plans to improve the biology of the soils on their farm.

Dr Stirling's latest book *Soil health, soil biology, soilborne diseases and sustainable agriculture* will be provided to all participants. This book contains a wealth of information about sugarcane soil health.

If you would like to see some of these microscopic creatures and learn how to encourage them in your soil, then this is your opportunity.

To register, please complete the registration form available from your local productivity services or SRA website in the events tab:

[http://www.sugarresearch.com.au/page/Your\\_SRA\\_at\\_work/Events/Soil\\_Health\\_and\\_Soil\\_Biology\\_Masterclass/](http://www.sugarresearch.com.au/page/Your_SRA_at_work/Events/Soil_Health_and_Soil_Biology_Masterclass/)

#### More information

**Sebastian Garcia-Cuenca**

0421 349 995

## Dates

### 2017

#### Ingham

28 February and 1 March 2017

#### Mackay

14 March and 15 March 2017

#### Ballina

28 March and 29 March 2017

### Coming in 2018

Far North

Ayr

Bundaberg

## Ashley Peterson – Hervey Bay

When asked about the soil health benefits of combining controlled traffic, raised beds and soybean rotation crops, Hervey Bay canefarmer Ashley Peterson said that within five years, his soils had much better tilth, which is a significant change compared to his soils 15 years ago. Under the previous system, his soils were compacted and cloddy.

Ashley said that improvements in soil structure and tilth led to improved root penetration and crop growth. In addition to soil health benefits, he said: "The changes we made have had a huge impact on our costs, productivity and profitability, so it has been a financially rewarding process".

The full story on Ashley's changes is available in the new book *Soil health, soil biology, soilborne diseases and sustainable agriculture*.





Mark Orr in the group's new JD 7210 R.

## New investment to allow for improved fertiliser efficiency

*Sharing machinery and some labour between farming enterprises is delivering efficiency gains for three Proserpine farming enterprises.*

A cooperative approach to machinery ownership is delivering productivity and efficiency benefits for the Large, Orr, and Auld families at Proserpine.

Farming 900 hectares within the one area just north of Proserpine, the three families share harvesting, planting and fertilising gear, as well as labour associated with harvesting and planting.

According to Mark Orr, they have this year continued that investment with a new John Deere 7210, and modified their fertiliser box to variable rate capability so that they can take advantage of the new mapping and recording technology offered by this tractor.

They have yet to put the rig to much work, but Mark is hoping that it will deliver major benefits to efficiency and productivity.

"It is a big step up from going to hydraulically controlling our fertiliser box and linking it with the GPS, compared to being wheel driven," he said.

The current focus is on using it to switch rates between paddocks, or ratoon-age, or between known areas of paddocks that require more or less nutrients.

Long term, they hope that they will be able to use technology such as EC maps and yield mapping in the harvester to driver further efficiency with their fertiliser application.

"We currently run a 2012 John Deere harvester that is geared up for another season, but we hope that our next harvester will have some form of yield recording," Mark said.

He said there was also a big efficiency saving from having machinery sitting in the shed less of the time.

With the exception of the new machine, tractors are typically put first to work as haul-outs and then become farm tractors once they reach about 5000 hours.

"With the farm tractors, on the trash blanket, we find that tyres wear out as much from age as from use. So just on the expense of tyres alone, before you factor in depreciation, it makes sense to be using them more often."

He said there were also benefits when it came to share-harvesting such as reducing ground speed and optimising efficiency. The harvester is able to walk between properties and the three farmers are able to work out their percentages with cutting equally.



All the farms are on 1.8 metre rows and GPS. Mark said the initial investment in GPS came as part of the Reef Rescue program (now known as the Australian Government Reef Programme) about 10 years ago, but it has since taken a life of its own, as demonstrated by their recent investment.

"We are happy with the results of both the GPS and the 1.8 metre rows and we feel so strongly about that that we were happy to buy this gear with no funding.

"With the wide rows, we have seen that this year when there has been wet weather there have been times when we have been the only group that has been cutting.

"It's not ideal, but we are only punishing a small area and there is a lot less damage to the crop."

For Mark, he is expecting the group's average to be about 95 tonnes of cane per hectare this season, but admits

that the race will be on to crush the region's crop, which has increased to an estimate of 1.9 million tonnes.

This would be the region's largest crop in 10 years.

He grows Q240<sup>dh</sup> on his better soil, Q232<sup>dh</sup> on the poorer soil, and Q208<sup>dh</sup> as an all-rounder, with several other varieties playing a minor role.

## SRA welcomes Anthony Curro to Brandon research station

SRA has welcomed Mr Anthony Curro to the role of Adoption Officer based in the Burdekin.

In his role within the SRA Adoption Group, Mr Curro will work with sugarcane growers and millers to drive productivity and profitability improvements.

Leader of the Adoption Group, Mr James Ogden-Brown said the Adoption Group was a crucial link between the research and development conducted by SRA, and translating this into practical outcomes that can be adopted by sugarcane growers and millers.

Mr Curro is working the Burdekin with a focus on precision agriculture, and alongside fellow Adoption Officer in the region, Andres Jaramillo (irrigation).

**Right:** SRA Adoption Officer, Anthony Curro.

Mr Curro grew up in the Burdekin and worked in the family farming business consisting of horticulture, sugarcane and mango orchards on a full time basis for 12 years.

He has also studied science at JCU and worked with the industry through work at the region's Natural Resource Management organisation.

"I'm excited about the opportunity with SRA to continue working in the Burdekin and also taking on the discipline of precision agriculture," Mr Curro said.



# How effective is your fallow?

*A successful crop cycle starts with the fallow. A well-managed fallow is one of the keys to a profitable crop cycle. In this article, SRA Adoption Officer **Gavin Rodman, Tully**, looks at the key aspects of a fallow which will help make your next fallow an effective one.*

The fallow period provides an opportunity to do jobs that aren't possible during the crop cycle such as realigning blocks and drainage works. The fallow period is also an opportunity to break the sugarcane monoculture.

Many growers believe that they already fallow optimally, though in reality, many current fallows are of very limited value – too short, too weedy, or too many volunteers.

## How long should my fallow be?

Your fallow should be long enough to allow any planned earthworks, to assist in your weed management and timing of operations, and also to kill the previous crop.

The length of the fallow, or having a fallow to begin with, will allow for less restrictions on when you may be able to plant the next crop. The length of your fallow should also be based on a carefully considered range of planting dates as soil temperature and soil 'wetness' are important factors in plant germination and a good establishment of the plant crop. Autumn planting is desirable in some areas, while late winter or spring planting is best suited to others.

If you are planning on growing a legume cover crop, your fallow should be long enough to allow planting any time after late October and a minimum of three months growth of the legume. This period of three months over the summer will allow for adequate vegetative bulk and nitrogen accumulation.

Fallowing with a legume cover crop is an excellent and sustainable method of enhancing soil health and structure, adding nitrogen and managing weeds.

## Is my fallow too weedy?

So what are the issues associated with allowing weeds to grow in your fallow? Letting weeds take over your fallow might not cost you today, but it will cost you extra in the long run as the seed bank for these weeds build up in the soil and continue to germinate and grow throughout the crop cycle.

Allowing weeds to grow and seed in your fallow will lead to years of intensive management, as the old saying goes: "One year's seeding, many years weeding".

Weeds can also serve as a host for some sugarcane pests, allowing them to survive between crops.

Nematodes are a major pest of sugarcane with yield losses believed to be as high as 10 percent in plant and 7 percent in ratoons across all sugarcane soils in Australia. Management of nematodes involves including a legume rotation and ensuring that the fallow is kept free of weeds, particularly volunteer cane from the previous cycle.

## What are the impacts of volunteer cane?

A good or effective fallow does not involve the presence of volunteer cane. Volunteer cane is cane that has ratooned after being sprayed out or tilled. Ensuring that your fallow is free from volunteers is the only way to break the issues associated with a monoculture.

Lifecycles of pests can be broken by well-managed fallows and, in turn, reducing pest numbers. Cane volunteers can attract egg-laying cane beetles and maintain soldier fly numbers, as these volunteers are an attractive food source for their young. Volunteer cane can also provide a food source for soil-borne diseases such as pineapple disease, fusarium sett rot and even serve as a host for ratoon stunting disease.

Ensuring your fallow is free of volunteers will give your plants the best chance for a healthy and disease free establishment.







Bruce Davies with son Josh, who is currently studying at the Gatton agricultural college (University of Queensland).

## Positive performance sets 2016 as a year to remember

*The 2016 season is shaping up as positive for sugarcane grower Bruce Davies.*

Bruce Davies started his farming career in 1993, and in those 23 years of farming he can't recall many years like 2016 when good yields have lined up with favourable world sugar prices.

Bruce met with **CaneConnection** in October as the crush was about two thirds complete in the Burdekin.

As is a common challenge across the industry in 2016, the progress of the harvest was behind where he would like it to be – but he is happy with the tonnes coming off the paddocks.

"When we started growing this crop we were facing severe water restrictions from the Burdekin dam, so we were very nervous and we were moderating our water use to be conservative," he said.

"So to go from that to a good crop is excellent."

"Our CCS may be slightly down. We normally average about 15.5, but this year I think it will be closer to 15. For tonnes, we are looking in the range of an average of 130-135 tonnes of cane per hectare, which is good for us and really what we need to justify the cost that comes with the water use."

He grows a large amount of Q183<sup>®</sup> and also sees Q208<sup>®</sup> as a strong performer, particularly when he is able to plant it early. He also likes how Q240<sup>®</sup> is performing and thinks it will be a "winner".

He chooses varieties based on recommendations from Burdekin Productivity Services (BPS) according to factors such as soil type.

He spends time and investment getting things right at the start of the crop cycle. This includes laser levelling when required.

Tillage is minimised, but the ground is worked if there has been a wet harvest (as trucks are used to haul out) and gypsum is used to ameliorate sodic areas.

Farm investment follows a conservative pattern where Bruce hopes that he can ride out the highs and lows of seasons and prices. Part of that plan saw the purchase of a new wide row track-tractor this year, which is able to move a larger implement and resulting in efficiencies in labour and fuel, as well as doing a better job.

"We have a conservative program of spending and basically keep to that, knowing that we need to be prepared for a rainy day," he said.

"For example, this year we're having a good crop, but we also know that with the season running late we are likely to have a smaller crop in 2017."

# Total Research Investment

Project Title	Project Number	Principal R&D Provider	Chief Investigator	End Date
<b>Key Focus Area 1</b> (Optimally-adapted varieties, plant breeding and release)				
Australian support for the International Consortium for Sugarcane Biotechnology (ICSB)	2010/002	SRA	Frikkie Botha	01/06/2017
Maximising genetic gain from family and within family selection	2011/343	SRA	Roy Parfitt	01/12/2016
Improving the accuracy of selection in sugarcane breeding trials through accounting for site variability	2012/351	SRA	Xianming Wei	01/05/2018
Exploiting introgression for the development of productive and regionally adapted varieties for NSW	2013/022	NSW Sugar	Roy Parfitt	01/05/2020
Sugarcane for future climates	2013/029	CSIRO	Chris Stokes	01/06/2017
Applying the genome sequence for variety improvement: validation and implementation	2013/030	CSIRO	Karen Aitken	01/08/2018
Developing cytogenetic and molecular tools to improve selection for soil-borne pathogen resistance in wild hybrids	2013/358	SRA	Nathalie Piperidis	01/04/2017
Phase 1: advancing yield, disease resistance and ratooning by exploiting new sources of genetic variability from wild relatives of sugarcane	2014/053	SRA	George Piperidis	30/06/2017
Optimising productivity and variety recommendations through analysis of mill data	2014/054	SRA	Joanne Stringer	01/08/2016
Field assessment and further development of high-sucrose sugarcane	2014/069	UQ	Luguang Wu	31/10/2017
Sugarcane root systems for increased productivity; development and application of a root health assay	2015/002	CSIRO	Anne Rae	01/07/2018
Impact of stool architecture on ratooning ability	2015/004	CSIRO	Anne Rae	01/07/2018
Leaf sucrose: the link to diseases such as YCS and enhancement of sugarcane productivity	2015/016	SRA	Gerard Scalia	30/06/2018
Generation of a high throughput SNP marker chip for introgression of resistance genes from wild germplasm into sugarcane, targeting smut, pachymetra and nematodes, to generate more resistant varieties faster	2015/025	CSIRO	Karen Aitken	30/06/2018
Selecting high value chromosomes from wild introgression material to deliver more resistant varieties faster	2015/026	CSIRO	Karen Aitken	01/08/2018
The Sugarcane Hub, development of a interface between the sugarcane genome sequence and sugarcane genetic data to allow researchers to identify genes that underpin important agronomic traits	2015/027	CSIRO	Karen Aitken	01/08/2017
Improving early stage selection of SRA breeding program by indirect selection of plant vigour	2016/028	SRA	Jaya Basnayake	01/07/2019
Optimising productivity, variety recommendations and mill operations through analysis of mill data	2016/032	SRA	Jo Stringer	01/02/2021
New approaches to identify and integrate Pachymetra resistance genes from Erianthus into SRA breeding program	2016/039	SRA	Nathalie Piperidis	31/12/2019
Licence to Farm: Nitrogen use efficient varieties to meet the future environmental targets	2016/044	SRA	Prakash Lakshmanan	01/07/2019



*Sugar Research Australia aims to invest in projects that will deliver real benefits on key issues for its investors.*

Project Title	Project Number	Principal R&D Provider	Chief Investigator	End Date
<b>Key Focus Area 2 (Soil health and nutrient management)</b>				
Strategies to manage soil-borne fungi and mitigate sugarcane yield decline	2013/101	CSIRO	Paul Harvey	01/08/2017
Regenerating a soil food web capable of improving soil health and reducing losses from soil-borne pests and pathogens of sugarcane	2014/004	Biological Crop Protection	Graham Stirling	01/07/2017
Role of controlled release fertiliser in Australian sugarcane systems	2014/011	CSIRO	Kirsten Verburg	01/08/2017
Boosting N-use efficiency in sugarcane through temporal and spatial management options	2014/045	USQ	Bernard Schroeder	01/10/2017
Assessment of new management strategies for marginal soils	2015/007	SRA	Barry Salter	31/12/2019
Improving NUE for sugarcane crops with constrained yield potential	2015/065	SRA	Danielle Skocaj	30/06/2019
Decision support for informed nitrogen management: soil nitrogen mineralisation test and the assessment of soil crop N contribution to crop N requirements	2015/069	DSITI	Phillip Moody	30/06/2018
Spatially explicit estimation of Achievable Yield Potential – an improved basis for fertiliser management	2015/070	CSIRO	Rob Bramley	01/07/2017
Improving management practices of legume crop residues to maximise economic and environmental benefits	2015/074	DSITI	Weijin Wang	30/06/2018
How much N will that crop need? Incorporating climate forecasting into nitrogen management in the Wet Tropics	2015/075	JCU	Yvette Everingham	01/05/2018
<b>Key Focus Area 3 (Pest, disease and weed management)</b>				
Innovative approaches to identifying the cause of chlorotic streak and new management strategies	2013/357	SRA	Barry Croft	01/06/2017
Solving Yellow Canopy Syndrome	2014/049	SRA	Dave Olsen	30/06/2017
Developing an alternative herbicide management strategy to replace PSII herbicides in the Wet Tropics area	2014/050	SRA	Emilie Fillols	01/01/2018
A Novel Polyphasic Framework to resolve Yellow Canopy Syndrome Paradox	2014/082	UWS	Brajesh Singh	01/05/2017
Validation of LSB-PCR diagnostic for ratoon stunting disease and characterisation of non-Lxx strains of Leifsonia associated with sugarcane	2014/086	USQ	Anthony Young	30/06/2017
Review of the sugarcane Industry Biosecurity Plan (IBP) and development of a Grower Biosecurity Manual (GBM)	2014/088	PHA	Rodney Turner	01/10/2016
Delivery of remote sensing technology to combat canegrubs in Queensland cane fields	2015/038	SRA	Nader Sallam	01/01/2018
Securing Australia from PNG biosecurity threats	2015/046	SRA	Rob Magarey	02/08/2017
Identifying new-generation insecticides for canegrub control as contingency for loss of amenity with the existing product	2016/003	SRA	Andrew Ward	2020
You can't manage what you can't identify: Managing threats from exotic moth borers through accurate identification	2016/041	SRA	Nader Sallam	2019
Molecular assay of major soil-borne pathogens for better exploitation of commercial varieties	2016/047	SRA	Rob Magarey	2018

Project Title	Project Number	Principal R&D Provider	Chief Investigator	End Date
<b>Key Focus Area 4 (Farming systems and production management)</b>				
Developing remote sensing as an industry wide yield forecasting, nitrogen mapping and research aide	2013/025	UNE	Andrew Robson	01/10/2016
Product and profit – delivering precision to users of precision agriculture in the Australian sugar industry – yield monitoring	2014/028	USQ	Troy Jensen	01/02/2017
A non-pneumatic cane cleaning system with no cane loss	2014/035	QUT	Neil McKenzie	01/12/2017
Too wet to forget – reducing the impact of excessive rainfall on productivity	2014/046	SRA	Barry Salter	01/07/2017
Increased harvest recovery: reducing sugar loss and stool damage	2014/048	SRA	–	01/07/2017
Modernisation of furrow irrigation in the sugar industry	2014/079	USQ	Malcom Gillies	01/07/2017
Demonstration of GPS-guided laser levelling and its associated productivity response	2014/094	Mulgrave Central Mill	Matt Hession	01/02/2018
Bio-prospecting for beneficial endophytes of sugarcane	2015/051	AgResearch	Stuart Card	01/01/2019
Cropping solutions for the sugarcane farming systems of the Burdekin (extension of 2011/922)	2015/077	SRA	Barry Salter	01/01/2017
Incorporation of Australian Crop Data and Industry characteristics into a Tool to Facilitate Informed Harvest Decision-making for the Australian Industry	2015/079	NorrisECT	Stuart Norris	01/09/2016
Sensors for improved harvesting feedback: a feasibility study	2015/080	SRA	Eloise Keefe	14/02/2017
Opening the data highway: Access to remotely sensed spatial and temporal data for the Australia sugar industry to assist with yield forecasting and nitrogen management	2016/062	UNE	Andrew Robson	01/01/2020
<b>Key Focus Area 5 (Milling efficiency and technology)</b>				
Determine the optimum tube dimensions for Robert evaporators through experimental investigations and CFD modelling	2012/054	QUT	Ross Broadfoot	01/05/2017
Improved modelling of wet scrubbers	2012/055	QUT	Anthony Mann	01/05/2017
A retrofit to a mill to reduce its operational and maintenance costs	2013/059	QUT	Geoff Kent	02/08/2017
Reducing the maintenance costs of mill rolls	2013/060	QUT	Geoff Kent	01/08/2019
Real time harvest and transport system (under contract)	2014/037	QUT	Geoff Kent	01/09/2017
Improving mill efficiency through rapid analysis methodologies	2014/051	SRA	Eloise Keefe	01/08/2017
Managing aspects of raw sugar quality in the Australian sugar industry	2014/052	SRA	Eloise Keefe	01/08/2017
Investigation into modifying pan boiling techniques to improve sugar quality	2015/013	QUT	David Moller	01/06/2017
Increasing capacity to undertake cane preparation research through modelling and experimentation	2015/018	QUT	Geoff Kent	01/05/2017
Develop a blueprint for the introduction of new processing technologies for Australian factories	2015/043	QUT	Ross Broadfoot	01/09/2017
Developing online analysis systems to measure the available nutrients in mill mud	2016/019	SRA	Eloise Keefe	01/03/2020
Reducing boiler maintenance costs and deferring capital expenditure through improved technology	2016/020	QUT	Floren Plaza	01/07/2019
<b>Key Focus Area 6 (Product diversification and value addition)</b>				
Process for making bagasse paper pulp	2012/053	QUT	Thomas Rainey	01/04/2018
A profitable future for Australian agriculture: biorefineries for higher-value animal feeds, chemicals and fuels	2015/902	QUT	Ian O'Hara	01/04/2019



Project Title	Project Number	Principal R&D Provider	Chief Investigator	End Date
<b>Key Focus Area 7 (Knowledge and technology transfer and adoption)</b>				
Increasing farm business intelligence within the sugar industry	2014/001	AgProfit	Matthew Bryant	30/06/2017
Measuring the profitability and environmental implications when growers transition to Best Management Practice (as defined by the new Canegrowers Smartcane BMP)	2014/015	DAF	Mark Poggio	02/05/2018
Improving industry returns through harvest best practice	2014/091	Sunshine Sugar	Ian McBean	30/06/2017
Understanding the impact of harvester speed on subsequent ratoon performance in the Burdekin	2014/092	BPS	Robert Milla	30/06/2017
Tissue culture – managing impediments to adoption in Tully	2014/093	TCPSL	Jordan Villaruz	01/01/2017
Sugar industry productivity and data recording spatial data hub for research and extension	2015/045	Agtrix	Robert Crossley	28/02/2018
Pre-commercial evaluation of a PCR-diagnostic for Ratoon Stunting Disease and the development of a business case for full implementation	2015/078	SRA	Nicole Thompson	01/03/2017
Protecting our chemicals for the future through accelerated adoption of best management practice	2016/002	SRA	Belinda Billing	01/08/2019
Master classes in soil health/soil biology for the sugar industry	2016/025	SRA	Andrea Evers	30/07/2018
<b>Key Focus Area 8 (Capability development, attraction and retention)</b>				
Enhancing sugarcane for decreased water content and increased sugar content at harvest	2011/072	QUT	Anthony Brinnin Mark Kinkema	01/05/2017
Production of furanics and chemicals from bagasse and molasses	2012/074	QUT	Joshua Howard William Doherty	01/06/2017
Investigating the utility of mill mud for soil health conditioning and nutrient use efficiency on sodic soils within the Burdekin	2013/077	USQ	John Bennett	01/09/2016
Effect of organic nutrients on sugarcane growth, microbial activity and greenhouse gas emissions	2013/078	UQ	Susanne Schmidt	01/05/2017
Sugarcane for water limited environments: characterization of a selected sugarcane germplasm for transpiration efficiency and high biomass production for the sugarcane growing regions in Australia	2014/102	UQ	Sijesh Natarajan Shu Fukai	01/06/2017
Exploiting soil microbe associations with sugarcane roots for resistance to canegrubs	2014/104	UWS	Andrew Frew	14/09/2016
Investigation of genetic control of sugar accumulation within the sugarcane culm (stalk)	2014/107	UQ	Patrick Mason	01/06/2018
Soil nitrogen dynamics – a microdialysis approach to quantify nitrogen cycling in sugarcane soils	2014/108	UQ	Scott Buckley	01/07/2018
Statistical data mining algorithms for optimising analysis of spectroscopic data from on-line NIR mill systems: improving system calibrations for quality measures and variety discrimination	2014/109	JCU	Justin Sexton	30/05/2018
Reduction of post-harvest deterioration of sugarcane	2014/401	SRA	Anthony O' Connell	01/08/2016
Enhancing sugarcane growth and yield by biocontrol agents/biofertilizers	2014/402	QUT	Jan Zhang	01/12/2016
A boiler simulator for improved operator training	2016/001	QUT	Anthony Mann	01/07/2018

**Sugar Research Australia Limited**  
ABN 16 163 670 068

**Head Office**  
50 Meiers Road  
Indooroopilly QLD 4068  
Australia

**Postal Address**  
PO Box 86  
Indooroopilly QLD 4068  
Australia

**Tel** 07 3331 3333  
**Fax** 07 3871 0383  
**Email** [sra@sugarresearch.com.au](mailto:sra@sugarresearch.com.au)  
**Web** [sugarresearch.com.au](http://sugarresearch.com.au)

