

HERBERT SUGAR INDUSTRY REPORT 2022



CROP PERFORMANCE 2022

Late 2021 saw some storms in October, with November and December being relatively dry which allowed crops to re-establish well. January and February had lower than expected rainfall. Early March was extremely hot with temperatures over 38 degrees Celsius being experienced. The wet season arrived in late March with rains continuing into the harvest season. Continued rains during the harvest season led to continued crop grow on and low CCS levels throughout the 2022 harvest season.

The cane harvest concluded on the 22nd. December 2022. A crop of 4.531 million tonnes of cane was harvested with an estimated 400 - 500 tonnes of standover left because conditions were too wet to allow for harvesting to occur or growers chose not to harvest because CCS levels were below 6 CCS. The average district yield for 2022 was 91.5 tchp, with a district average CCS of 11.61. The low CCS could be attributed to the low solar radiation, rat damage and suckering of the cane crop.

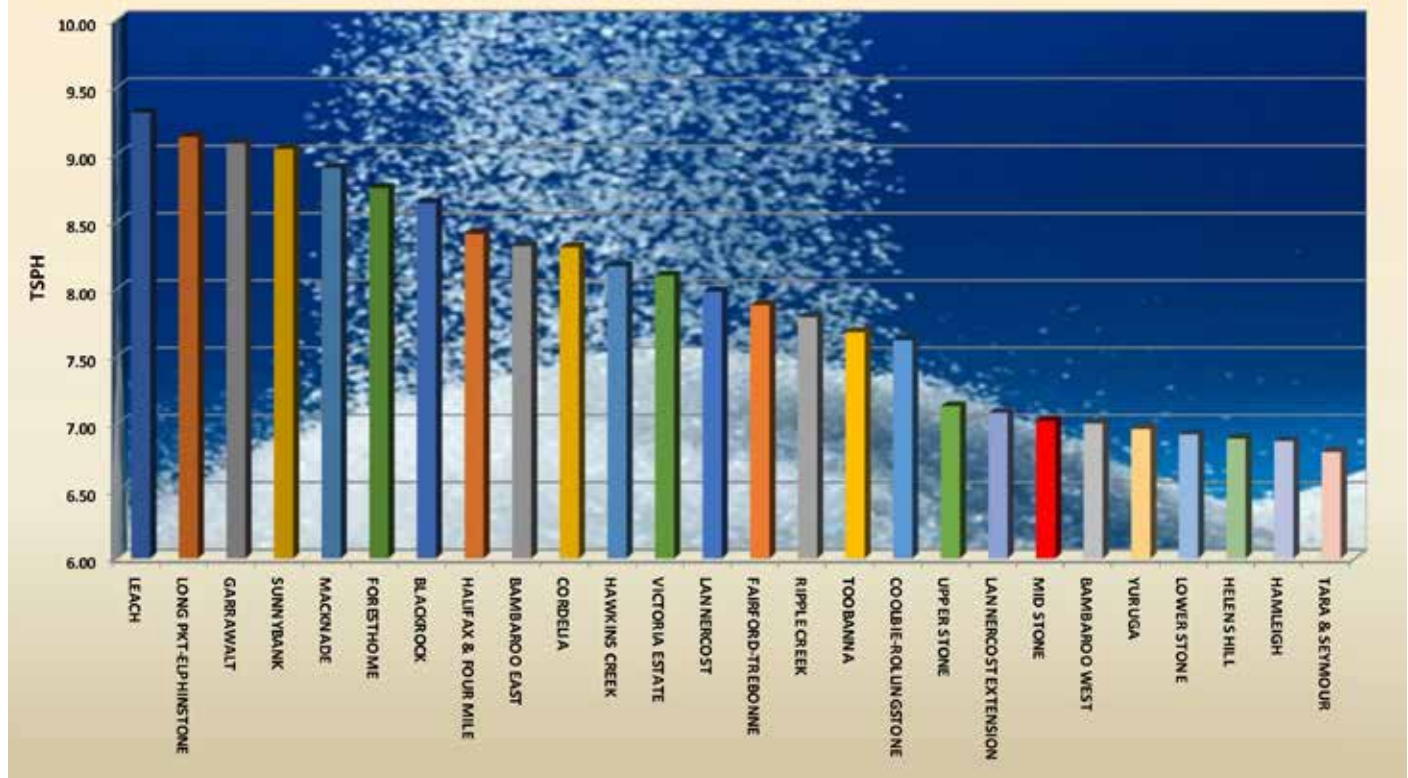
Rat numbers slowly rose in 2020 and 2021 seasons, with a major explosion to plague levels occurring in 2022. The mild wet seasons of 2021 and 2022, heavily lodged crops with weeds emerging through the crop and a crop laying on the ground made it ideal for rat damage to occur. The rat damaged cane deteriorated, causing high levels of dextran and poor cane quality going to the mill for processing.

Historical Data

Year	Tonnes	Ha Harvested	CCS	Cane Yield	Sugar Yield
2005	5553359.05	57078.93	13.15	97.29	12.76
2006	4899992.30	57655.81	12.64	84.98	10.72
2007	4287010.73	57158.66	13.87	75.00	10.38
2008	4688595.64	55061.21	13.55	85.15	11.53
2009	3920941.21	51171.33	14.82	76.62	11.33
*2010	3274402.07	39567.98	12.88	82.75	10.64
2011	2920227.24	52361.15	12.93	55.77	7.19
2012	3625680.08	50394.18	13.61	71.95	9.77
2013	4000685.4	54017.57	13.97	74.06	10.33
2014	4152315.85	55800.99	13.65	74.41	10.13
2015	4459593.58	56590.9	13.45	78.77	10.56
*2016	4811839.74	56162.09	12.30	85.67	10.50
*2017	5033376.39	57119.45	12.96	88.18	11.36
2018	4718178.26	57043.23	14.24	82.71	11.78
2019	4055299.12	56361.12	13.92	71.96	10.00
2020	4250399.37	55224.52	13.25	76.97	10.13
2021	3797257.53	54985.47	12.79	69.10	8.80
*2022	4531003.93	49495.77	11.61	91.50	10.60

* Standover Left

District Productivity





THE SERVICES ON OFFER AT HCPSL

Herbert Cane Productivity Services Limited (HCPSL) is a non-for-profit organisation established to provide agricultural technical services and support to the Herbert Sugarcane industry. The key focus of the company is to drive productivity and sustainability outcomes for the local industry.

Cane farmers from the Herbert cane growing region and the local miller (Wilmar) can be members of the company. The HCPSL Board is represented by its membership, with 3 grower and 3 miller members holding positions on the Company Board.

HCPSL consists of 2 technical service groups:

Service Fee Funded Activities

HCPSL undertakes the following activities through the service fee its members pay annually -

- Provision of cane through the HCPSL Approved seed program, consisting of access to cane from the “Clean” Seed plots, tissue culture program and hot water treatment facilities. This activity is resource hungry and constitutes a significant component of the HCPSL annual budget.
- HCPSSL leases 3 farms in the Central Herbert, Lower Herbert and Stone River areas and has commercial arrangements with growers in the Ingham Line, Lannercost, Hawkins Creek and Abergowrie.
- Plant source inspections and associated disease testing of grower’s cane to be used for planting.
- Provision of basic crop agronomy advice.
- Provision of basic advice on pest and disease management.
- Provision of basic advice on fallow management.
- Provision of basic advice on herbicides and pesticides.
- Provision of variety management advice.
- Access to the HCPSL GPS basestation network.
- Laser levelling and dumpy level surveys.
- Access to services provided by the Hinchinbrook Community Feral Pig Management Program.
- Access to a biannual newsletter.
- Access to the HCPSL website.

As part of the core funding, HCPSL also funds variety development activities in the district supporting the HCPSL Ratoon Variety Trials (RVT) program.

Externally Funded Projects and Services

HCPSL offers fee for service activities and undertakes work delivered under commercial contracts between government agencies, NRM groups, CRC’s, universities or commercial companies. Activities that fall within this category are:

- Soil tests for nutrients and pathogens (like *Pachymetra* and nematodes).
- Irrigation water quality testing.
- Farm specific - Nutrient management plans.
- Farm specific - Pest and weed management plans.
- Group and mass media extension activities like:
 - o Chemical use accreditation courses.
 - o Training courses (like Farming 4 Cash™, Back to Basics workshops, Harvesting and Haulout courses).
- Electromagnetic soil mapping.
- Precision agriculture application maps.
- Drone mapping and other applications.
- Soil Health project activities.
- Harvesting development project activities.
- Environmental services and stewardship programs.
- Development activities associated with soil amendments, fertilisers, chemicals, etc.

For more information concerning services offered by HCPSL please contact the Manager Lawrence Di Bella on 0448084252 or 47761808.



New GPS Basestation installed at Warrens Hill

THE WHO, WHAT, WHEN, WHERE & HOW OF THE 2023 HCPSL SEED PLOTS



HCPSL Macknade Plot

Address: HCPSL Macknade Farm
Varieties Available: Q219 Q231 Q232 SRA28 Q242 SRA26 SRA36
1st Ratoon Only Q208 Q240 Q253 Q200 WSRA24 KQ228 SRA10 SRA14 SRA6
Open Day: Wednesday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Tony McClintock 0447 304 963

HCPSL Stone River Plot

Address: HCPSL Stone River Farm
Varieties Available: Q138 Q200 Q208 Q240 Q253 SRA36 SRA28 SRA26 SRA5 WSRA24 SRA6
1st Ratoon Only Q219 Q247 SRA10 SRA14 Q215 Q226 Q231 Q238 Q183 MQ239
Open Day: Monday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Jason Caruso 0417 622 129

HCPSL Central Plot

Address: Hamleigh Road
Varieties Available: Q208 SRA6 SRA26 SRA36 Q253 SRA28 Q240 Q200 Q250 Q242 Q226 Q183 Q219 Q232 SRA6 WSRA24 Q252
Open Day: Tuesday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Lawrence 0448 084 252 or Peter 0490 887 332 or Rhiannan 0490 905 367

HCPSL Central Plot (Reinaudo)

Address: Hamleigh Road
Varieties Available: **1st Ratoon Only** Q183 Q252 SRA 5 SRA14 SRA26 SRA28 SRA 36
Open Day: Tuesday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Lawrence 0448 084 252 or Peter 0490 887 332 or Rhiannan 0490 905 367

Hawkins Creek Plot

Address: Hawkins Creek Road
Varieties Available: SRA36 Q183 Q240 Q232 Q239 SRA26 SRA28 Q208 Q200 Q253
Open Day: Wednesday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Richard Hobbs 0400 544 301

Long Pocket Plot

Address: Scotts Road Long Pocket
Varieties Available: KQ228 MQ239 Q200 Q208 Q231 Q232 Q240 Q253 SRA6 SRA26 SRA28 SRA36
Open Day: Monday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Richard Hobbs 0400 544 301

Ingham Line Plot (Zatta)

Address: Yuruga Road
Varieties Available: Q208 SRA26 SRA36 SRA10 Q138 Q232 SRA28 SRA14 Q240 Q253 Q200 Q183 Q219 SRA5 Q226 Q238
Open Day: Thursday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Tony McClintock 0447 304 963

Abergowrie Plot (Erkkila)

Address: Abergowrie Road
Varieties Available: **1st Ratoon only** Q200 Q208 KQ228 Q231 Q2K32 Q240 Q250 Q253 SRA14 SRA26 SRA28 WSRA24 Q242
Open Day: Thursday 7.30 am
Billets: Please call in advance so a billet harvester can be organised.
Staff Member: Richard Hobbs 0400 544 301

TISSUE CULTURE

Tissue culture for the year of 2022 was at record the biggest year of sales however the 2023 sales have beaten it again. Tissue culture is definitely the way of the future.



HCPSSL Staff Rhiannan Harragon and Jason Caruso ready to plant tissue culture



Tissue culture plants at the Stone River nursery



Planting tissue culture plants at the HCPSSL Macknade Farm

HCPSSL RVT TRIAL RESULTS

Location: Hamleigh (Abergowrie Road)

Crop class: First ratoon

Soil type: Clay

Harvest date: October 2022

Variety	TCPH	June 2022 (early CCS)	October 2022 CCS (harvest date)	TSPH	Comments
Q208	55	10.49	13.12	7.2	Released in the Herbert 2009
Q231	63	12.96	14.25	8.92	Released in the Herbert 2009
Q253	103	11.39	12.53	12.9	Released in the Herbert 2014
WSRA24	99	9.91	13.19	12.45	Released in the Herbert 2019
SRA6	111	11.43	14.09	15.58	Released in the Herbert 2022
SRA12	36	11.13	12.75	4.54	The Herbert Regional Variety Committee discarded the variety in 2021 based upon poor performance in SRA Herbert plant breeding trials and fibre concerns
SRA14	66	9.8	12.58	8.26	Released in the Herbert 2018 - Released as richland variety and for soil with high <i>Pachymetra</i> levels
SRA15	66	13.35	13.93	9.24	The Herbert Regional Variety Committee discarded this variety in 2021 because it is highly susceptible to smut
SRA16	71	10.7	14.16	9.99	The Herbert Regional Variety Committee discarded this variety based upon poor performance in SRA Herbert plant breeding trials in 2016
SRA22	64	12.42	13.62	8.65	The Herbert Regional Variety Committee discarded the variety in 2021 based upon poor performance in SRA Herbert plant breeding trials, fibre quality concerns and poor ratooning
SRA28	65	13.29	13.23	8.51	Released in the Herbert 2020

Note

- The plot size for each variety was approximately 0.25ha
- Small mill CCS was undertaken in June and October.
- Severe rat damage impacted on the cane yields of especially Q208, Q231, SRA12, SRA22 and SRA28.
- The SRA12 germinated poorly in plant cane.

GROWER AND INDUSTRY FORUMS

COVID restrictions started to be lifted in 2022 and HCPSL could recommence it's face to face field days, workshops and forums.

The Herbert Walk and Talk Day

The 2022 Herbert Walk and Talk Day was held at the HCPSL Macknade farm on the 9th of March 2022. The day was well attended with over 125 attending the event. The day was extremely hot with temperatures reaching over 38 degrees Celsius.

The following presentations were undertaken:

- Varieties and their management - presented by SRA
- Harvester management tools - presented by SRA, Norris ECT and John Deere
- Cover crops and their management - presented by Project CaNE and Catalyst
- RSD Management - presented by Project CaNE and HCPSL
- Tissue culture and their management - presented by HCPSL
- New herbicides - presented by Nufarm

HCPSL Shed Meetings

Round 1 - HCPSL shed meetings were conducted on the 27th to 29th of April with over 100 growers attending the events.

The following presentations were undertaken -

- Introducing the new RSD testing method qPCR
- The management of HCPSL Approved Seed Plots
- Tissue culture cane orders
- Individual farm productivity
- New varieties for release

Round 2 - HCPSL shed meetings were conducted on the 10th to 12th of October with over 130 growers attending the events.

The following presentations were undertaken -

- Project CaNE water quality monitoring
- The management of standover cane
- Management of rats and the Rattoff® product stewardship program

HERBERT SUGAR INDUSTRY AWARDS PRESENTED IN 2022

AWARD	RECIPIENT
Grower of the Year (Sponsored by Wilmar Sugar)	Ian Kemp
Young Grower of the Year (Sponsored by Wilmar Sugar)	Briannan Pace Rebekah Pace Jeffrey Pace
Mangrove Jack Award (Sponsored by Herbert River Catchment Group)	John Pavetto
Harvesting Efficiency Award (Sponsored by Sugar Research Australia)	Celotto Harvesting
Innovation Award (Sponsored by Rabobank)	Mizzi Farming
Farm Presentation for Harvesting Award (Sponsored by Honeycombes)	Walter Giordani
Improved Farm Layout Award (Sponsored by Canegrowers Herbert River)	Remo & Gino Zatta
Consistent High Productivity (Sponsored by QSL)	Glen Irlam Beeva Nominees Pty Ltd Pace Farming Russo Farming Glen Cristaudo
R&D On-farm Co-operation (Sponsored by HCPSL)	Abergowrie Sugar Beeva Nominees Pty Ltd Paul Dametto Greg & Todd Erkkila Wilmar Sugar
Lifetime Achievement Award (Sponsored by HCPSL)	Jo Stringer Joe & Gerry Girgenti Lex Mackee



The HCPSL and Nufarm stall at the Walk & Talk Day discussing new herbicides and mixing Glyphosate products



Project CaNE™

Providing growers with agronomic support and tailored solutions to help them improve productivity, profitability, and environmental outcomes on their farm.

Project CaNE aims to deliver tailored nutrient plans (CaNE Plan™), interactive workshops and grower activities, productivity and economic analysis of farming practises related to nutrient management (Clear as Mud™ program), and the monitoring of water quality across the Herbert region. Funded by a partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, HCPSL and its team of extension agronomists and support staff, have developed partnerships with TropWATER and DAF Queensland, to provide growers with expertise in crop agronomy, agricultural economics and water quality monitoring.

Project CaNE delivered CaNE Plans to 160 farms in 2022. Each CaNE Plan is a whole farm nutrient management tool that provides growers with a one-stop solution to evaluating, managing and recording on-farm nutrient applications. To complement the CaNE Plans, Project CaNE released a series of Farming 4 CASH™ – Back to Basics videos. Each video covered a specific nutrient management topic, such as using mill by-products, lime and other ameliorants, and how they affected soil properties such as pH and CEC (cation exchange capacity).

With above average rainfall and so many disruptions to the harvest in 2022, the project was successful in harvesting all but one of its demonstration trials. Four nitrogen (N) stabiliser demonstration trials in the Stone River, Central Herbert, Wet Belt and Abergowrie sub-districts were harvested and retreated, while four out of the five mill by-product demonstration trials were harvested. Results of these sites will be collated, analysed and reported back to growers in 2023.

Water quality (WQ) monitoring is another large component of Project CaNE. The eleven sites established in 2021 were monitored for nitrate levels in 2022 with live results available through the HCPSL website on the 1622™ platform. Project partners from TropWATER also presented to a number of infield and shed meetings in 2022 with plans to present further findings to growers again in 2023.



Project CaNE Extension Agronomist Bailey Kilpatrick working through a CaNE Plan with Santo and Leah Russo



Extension Agronomists Adam Royle (Project CaNE), Megan Zahmel (Project Catalyst) and Rod Nielson (HCPSL GIS Officer) workshopping EM mapping with Herbert growers in August 2022



Growers attend a mill by-product field day in September to learn about new infield application technology



Extension Agronomists Adam Royle (Project CaNE) and Bethany Donker (Project Catalyst) prepare to deliver a legume management workshop at the 2022 Herbert Walk & Talk Day

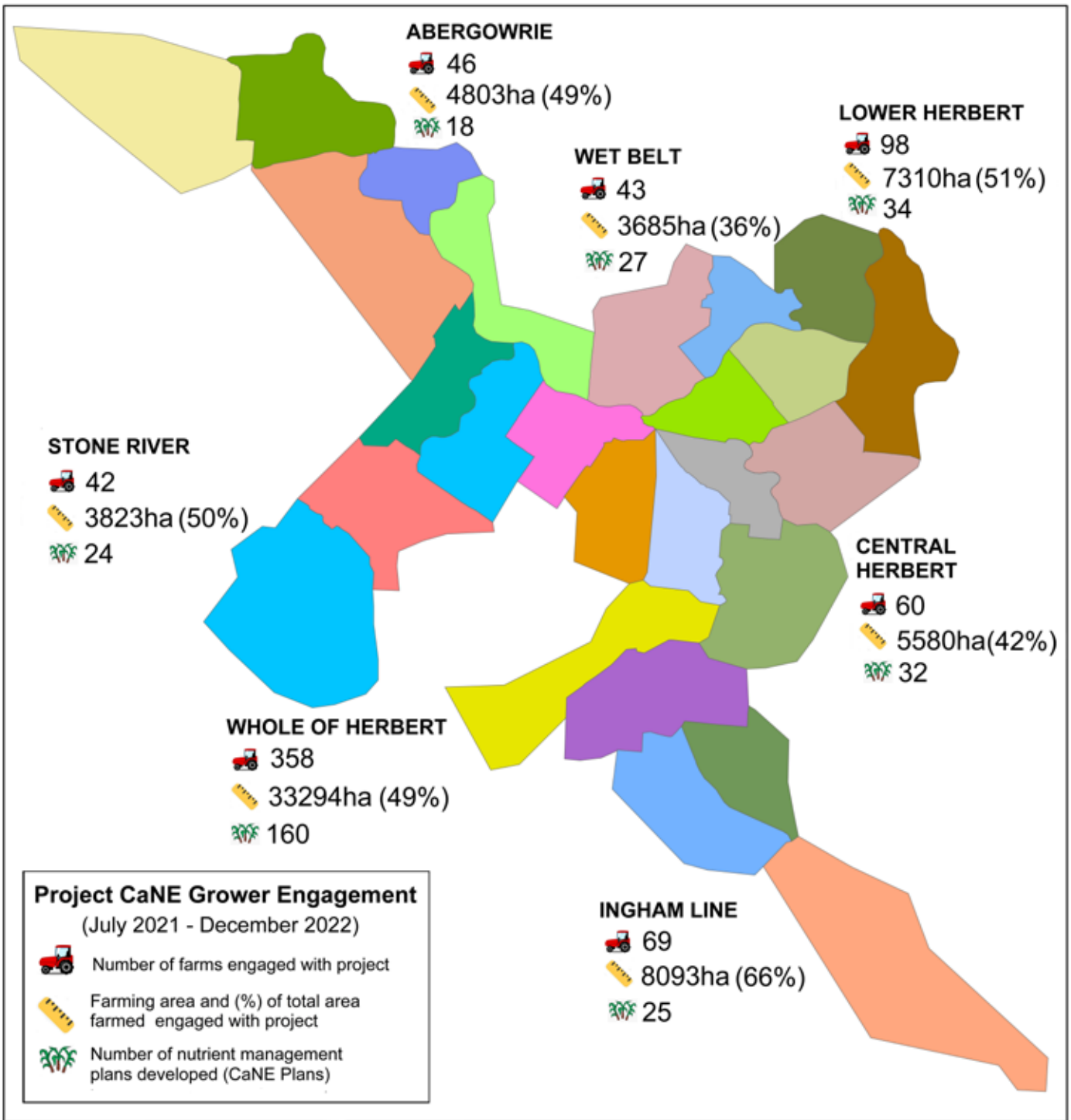
Project CaNE™ is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.



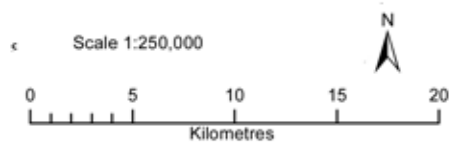
Great Barrier Reef Foundation



EXTENSION



Project CaNE is funded by a partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.



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Providing growers with agronomic support to adopt new innovative farming practices to improve productivity, profitability and environmental outcomes

In 2021 Project Catalyst was funded by a partnership between Australian Government's Reef Trust and the Great Barrier Reef Foundation to support sugarcane growers in promoting innovative farming practices that will improve sustainability and water quality from farmland.

This collaboration will aim to deliver growers nutrient management plans, on farm demonstration trials, interactive workshops, EM mapping of blocks, on farm water quality results and an invitation to the Annual Project Catalyst Forum.

The program has achieved to date:

- A total of 26 growers have signed up to try new farming practices, with 4 more growers coming on board in 2023 to achieve a total of 30 growers to join the Project Catalyst team. Practice changes trialled by individual growers, if successful, have the potential to be adopted over 3,804 ha which is the total current project area.
- All 26 Catalyst growers received a Nutrient Management Plan with a total nitrogen and phosphorus farm budget to help growers make informed decisions when fertilising their crops. This aids growers in improving the productivity and profitability of their farming businesses as well as achieving best management practice accreditation.
- 150 ha of land have been EM mapped under the project so far. EM mapping helps growers identify soil constraints within the blocks and farms. The maps can then be used to apply amendments in a more precise manner for targeting specific soil constraints.
- Over the 2021/2022 summer season, Project Catalyst growers put 48% of fallow land under legumes helping growers improve overall soil health and creating potential to reduce fertiliser inputs.
- Two sites were chosen last wet season to monitor water quality leaving individual blocks, demonstrating improved runoff water quality from different practice changes. Another two sites will be chosen this coming wet season to monitor water runoff and compare practice change advantages once again.
- 8 grower information sessions have been held over the last two years, with some of those sessions in collaboration with Project CaNE. These are a great way for growers to learn new information and keep up to date with industry practices. Information sessions and workshops also give growers a chance to discuss with each other the ins and outs of newer farming practices and technologies. So far some of the topics discussed in the information sessions have been legumes, inoculants, bean planters, drone technologies, EM mapping, water quality results and the latest in mill mud applications.
- 3 Innovation trials have been running since 2020 with the trials coming to a finish this season. The Zonal Imidacloprid trial has successfully resulted in both controlling grubs and improving water quality outcomes, while the Smarter Weeds with Drones concept still needs some work to keep up to date with camera specs to better identify weeds from cane. The Variable Rate Phosphorus trial has shown that there are big discrepancies with P variability within a block and that recommendations from an average randomised soil sample may be contributing to P deficiency throughout the cane blocks.

Project Catalyst will continue to support growers who show an interest in adopting effective farming practices until the program ends in 2024. If you would like to know more about Project Catalyst, please feel free to visit their website at www.projectcatalyst.net.au.



Great Barrier
Reef Foundation



INNOVATION TRIALS

PROJECT CATALYST



Trial team



Fertilising the trial



Marking out the trial

ZONAL IMIDACLOPRID

Creating prescription maps for canegrub-susceptible soil and applying imidacloprid through GPS rate controller to test if imidacloprid can control cane grubs without the traditional blanket application approach.

38% Reduction of applied imidacloprid product.

\$2,080 Estimated savings by zonally applying product*.

*based on Confidant Guard in 2020. Product no longer available. Costs may differ.



Spot-spraying guinea grass

MANAGING WEEDS SMARTER WITH DRONES

Using high resolution aerial imagery from Remotely Piloted Aircraft (drones) to map weed infestations in cane and to precisely apply different herbicide treatments to address infestations of weeds.



Groundtruthing guinea grass GPS pts

VARIABLE RATE PHOSPHORUS

Strategically apply phosphorus where it is required as opposed to broad rate application of phosphorus to target and improve yield and profitability.



The LHWQP is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation with support from The Coca-Cola Foundation and the WWF-Australia.

EXTENSION

Over the past 2.5 years, HCPSL has partnered with Cultivate Farms to drive and support the next generation of farmers in the Herbert. By partnering with Cultivate Farms, HCPSL aimed to provide growers in our region with the tools and resources to find a pathway to ownership or scale an existing farming enterprise. The aim of Cultivate Farms is to challenge traditional pathways of farm ownership, allowing aspiring farmers the opportunity to own their own farm.

Throughout the project HCPSL hosted a range of events for both aspiring growers, and growers looking to age on-farm. These events aimed to highlight non-traditional farm ownership options to aspiring and aging growers across the Herbert district.

In 2021 and 2022, aspiring farmers in the Herbert were given the opportunity to participate in a farm ownership 'incubator' program called Cultivator. The Cultivator program offered farmers in the Herbert the opportunity to improve their farm management skills and develop a farm investment proposal. As part of the Project, multiple Reef Catchment 'Cultivator Scholarships' were offered to aspiring, next-generation farmers (valued at \$2000).

After extending the project for the duration of 2022, HCPSL and Cultivate Farms facilitated 3 'matches' in the Herbert. To support these farmers, HCPSL provided technical support in the form of Nutrient Management Plans, Integrated Weed Management Plans and one-on-one agronomic advice.

Following the success in the Herbert, Cultivate Farms will present at the upcoming Project Catalyst Forum in February 2023.

Together with Cultivate Farms, HCPSL hopes these matches will provide the catalyst for future discussions into non-traditional farm ownership options, for both aspiring and aging growers in our district.

HCPSL aims to encourage aspiring and innovative, existing, and new growers into the Herbert Cane Industry. For further information about Cultivate Farms or the Project, visit <https://www.reeffarms.com.au/> or <https://hcpsl.com/current-projects/cultivate-farms/>



Lawrence Di Bella (HCPSL), Sam Marwood (CEO Cultivate Farms) and Ellie McVeigh (HCPSL)



Lawrence Di Bella discusses Cultivate Farms with interested Herbert growers.



Cultivate Farms participant, Hayden Di Bella chats with Project Catalyst.



Sam Marwood (Cultivate Farms CEO) presents to Herbert growers at the 'Farm & Frothy' event.

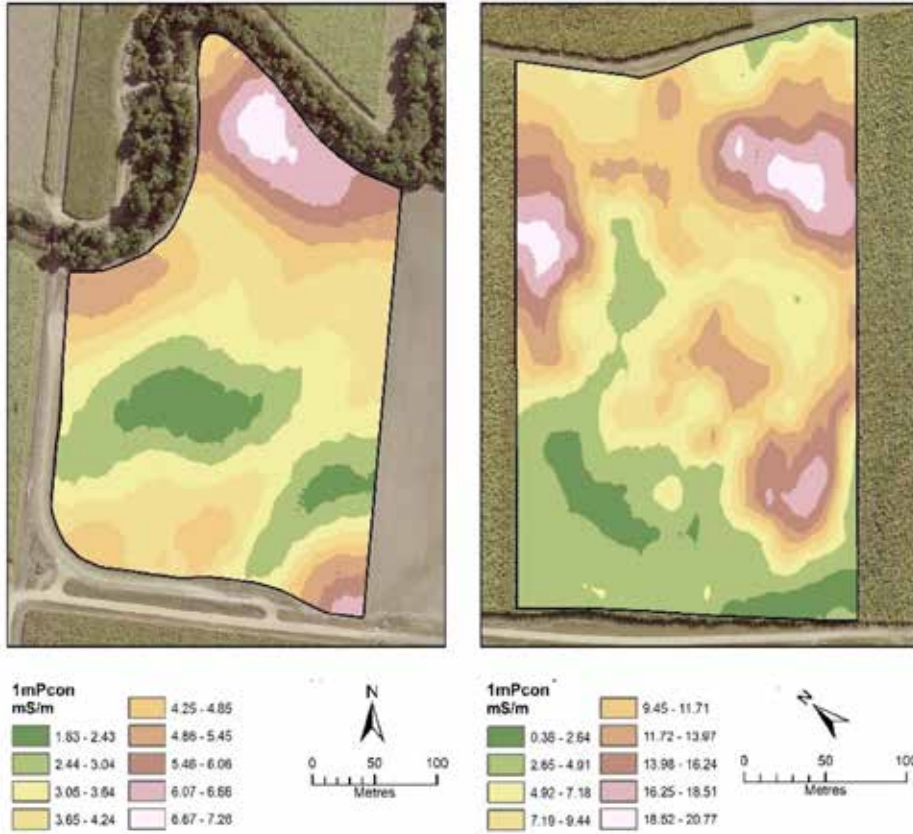


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Reef Foundation

UNDERSTANDING YOUR EM MAP

In March 2017, HCPSL began the work of collecting electromagnetic conductivity (EM) data across the Herbert cane growing area. Since then, over 2,500 hectares have been mapped being made up of more than 730 cane blocks. The majority of the mapped area has been in parts of the Herbert not soil mapped by Andrew Wood's team in the 1990's.

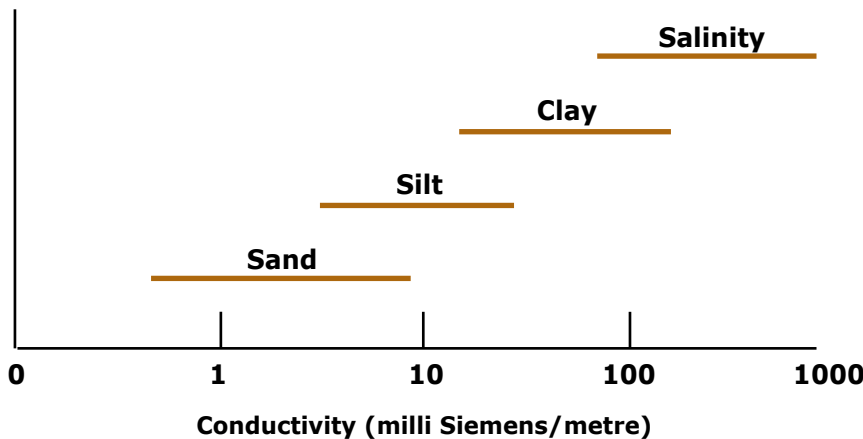
Understanding changes in soils across a field goes some way to understanding the changes in crop performance and productivity across the field. EM mapping is one of the tools to help with this.



Map 1 showing two fields with different ranges in EM values

can be driven by soil structure. Other less influential components include soil bulk density, organic matter, cation exchange capacity (CEC), mineralogy, and temperature.

The range between the minimum and maximum values indicates the variability in the soils in the field. Graphic 1 (left)



Graphic 1 showing EM values and soil structure

sodicity, other soil nutrient or trace element deficiencies which can inhibit optimal crop growth and therefore yield. The usual prescribed method of soil sampling which creates an average value across a block, treating the block as a whole, doesn't allow some of these changes, which can be area specific (or management zone) to be identified. Hence remediation work, using soil amendments or variable rate nutrient application, cannot be undertaken effectively.

Every EM map HCPSL produces uses the same default set of colours and the same number of classes to show the change in EM values across the block[s]. The important thing to note first is the range of the EM values in the legend. This shows the variability of electrical conductivity in the soil. Small changes mean not much variability (left map), while greater change means more variability in the soil conductivity (right map).

Low variability in EM values doesn't necessarily mean that the soils are the same across the block, just that the changes do not greatly affect the electrical conductivity of the soil, and differences, therefore can't be properly identified that way. Other methods also need to be considered, including yield mapping and vegetation indices like NDVI, from drones or satellite imagery.

Changes in EM data across a field becomes the basis for targeted soil sampling, that is, sampling because there is an identifiable difference in the conductivity of the soil. The primary sources of variability in EM values in salinity and soil moisture. When salinity is not an issue locally, and soil moisture is uniform, changes in soil EM values

is uniform, changes in soil EM values shows the overlap between different soil structures with relation to EM values. The amount of overlap between EM and soil structure means that the EM values can't be directly used to identify soil structure. It can help to identify lighter sandy or loamy soils from heavier clay soils. Soil testing is still necessary.

Unfortunately changes in productivity don't always align with changes in soil type, that is, according to a soil map. EM data enables the continuous change in electrical conductivity to be displayed on a map in a way that shows some of the nuanced changes in the soil and its properties across a block.

Soil sampling according to changes in EM values has identified areas of

The changes in soil EM values, in many cases becomes the basis for variable rate lime or gypsum (or both) application maps. Often three or four infield management zones are identified and used to create a shapefile which is loaded onto a GPS screen in a tractor to run the variable rate controller on a spreader.

SATELLITE IMAGERY

When the European Space Agency decided to make the satellite imagery from it's Sentinel 2 satellites available for free, it opened up an opportunity for crop monitoring at field, farm, district and regional scales. HCPSL has been a user of this resource for several years now, using to identify low-yielding areas with cane blocks which are difficult to see from the edge of the block, changes in crop health throughout the year, and even with identifying the extent of flood events over the past few years.

Unfortunately, satellites orbiting the earth at between 550km and 800km above the earth, need clear skies to see the ground. 2022, being wet throughout most of the season, meant that there was a lot of cloud cover to obscure the ground from the satellites. While the Herbert managed to be clear six times for the year, the timing of the clear images is not always good. Of course, a clear sky needs to coincide with the date and time when the satellite comes over the district to collect imagery. The sky over the lower Herbert was clear twice in March, once in May, once in July and twice in December.

When the sky isn't completely clear, it is often clear enough to provide data over at least some of HCPSL's trial blocks, allowing some monitoring to be continued, especially when the cane becomes too tall to see over, and too difficult to walk through.

There are a couple of companies like Data Farming which make satellite imagery available online to those who wish to use vegetation indices such as NDVI to monitor their own farms. Currently online viewing is free, but if a grower wishes to download the data to use in farm management software, such as Vantage, FarmWorks and SMS etc, then there is a fee. The advantage of using a farm management software system is that EM data, Yield data and satellite imagery can all be stored in the one place on your computer. This allows various analysis to be undertaken using multiple data types to further help understand your productivity, with a view to generating better, statistically based management zones.

WEATHER STATIONS


As of December 2022, there are more than 100 private weather stations across the Herbert, transmitting weather information to the internet.

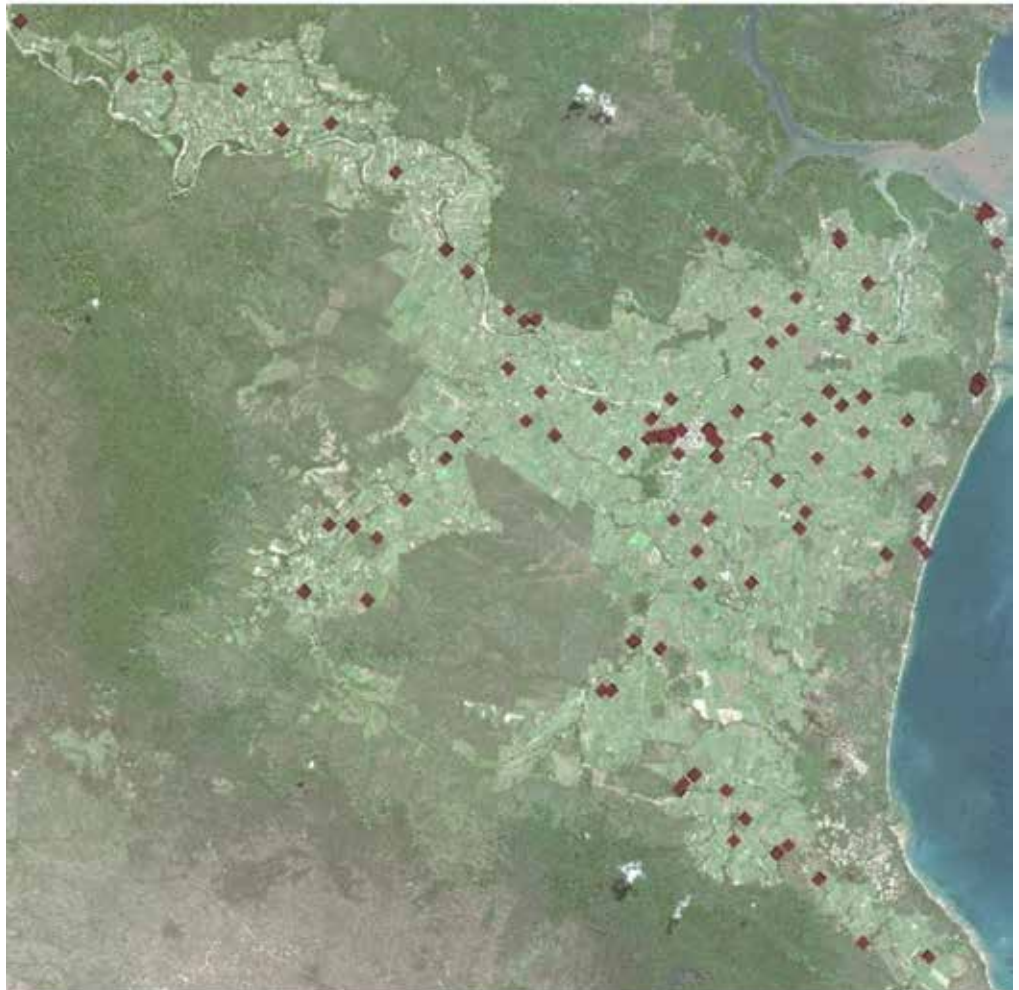
Note: These weather data may not be 100% correct, but it will provide a good idea of what is happening across the district. None of these weather stations are owned or managed by HCPSL.

To access these weather stations, search Wundermaps (yes, that's the spelling) in Google. Click on the link for

[WunderMap® | Interactive Weather Map and Radar](#)

to go to the website. Then like in Google Earth, pan the map to find the Herbert. You will need to go into the settings to change the temperature from °F to °C. Click on Layers to view the options for the different data types.

Click on an icon  to open a webpage with more details on the weather conditions at that site.



RATOON STUNTING DISEASE (RSD)

RSD is a significant concern across the district with 9% of fields inspected (up from 7% in 2021) for use as plant source infected with the disease. The increase can be attributed to HCPSL approaching growers who had not previously tested their cane in years gone by. Yield losses up to 40% can be experienced in some varieties, so the disease can have a significant impact on crop viability and ratoon length.

RATOON STUNTING DISEASE (RSD) AND CHLOROTIC STREAK DISEASE (CSD) THROUGH APPROVED SEED CANE USE.

The district continues to manage RSD and CSD through the HCPSL Approved Seed plot and plant tissue culture programs. HCPSL offers farmers the opportunity to obtain Approved Seed cane from its plots, tissue cultured cane plants and hot water treatment of cane. Data and trials both show that the use of clean seed can increase average farm yields by 10 to 13% of tonnes of cane/ha.

The data below showcases the number of tonnes through these programs over the past few years and the alignment with the HCPSL Rise Above Program objectives.

Year	Approved Seed sales (t)	Tissue culture sales (# of plants)	Cane hot water treated (t)
2020	1088	9400	100
2021	1482	17000	138
2022	4112	19250	41

HCPSL staff undertook over 2707 seed inspections for growers in 2022 prior to planting. Get Approved seed cane from HCPSL annually - this is the simplest and easiest way to increase cane yields on your farm.



Cutting at the HCPSL Approved Seed Plot

Don't assume the cane you get from your neighbour is disease free. Get it tested before you use it!

NEMATODES

HCPSL funded a nematode survey across the district in 2019/20. SRA Pathology staff supported the survey by analysing the soils sent.

The results from the survey clearly indicated that lesion nematodes (*Pratylenchus zeae*) were present in large numbers in almost all sugarcane fields surveyed. The survey results confirm previous research findings that root-lesion nematodes are the most common parasitic nematodes associated with sugarcane and can cause significant production loss.

Nematodes continue to be an issue in some blocks in 2022. SRA has decided to screen varieties for nematode tolerance levels and provide this information to industry to better manage this pest.

Nematodes at present can be managed in a sugarcane farming system through the following ways -

- Variety selection
- High carbon inputs - Research undertaken in the past four years in the Herbert, through Project Catalyst and the CRC for Soils, also found that high carbon inputs to the soil (like some cover crops) can significantly increase the numbers of beneficial nematodes, which in turn prey on the parasitic nematodes.
- Use of nematicides like Nimitz™.

PACHYMETRA ROOT ROT

This disease is of serious concern to industry and has been directly linked to reduced productivity of some fields, ratoon failure and posing a crop stress, which in turn leads to the crop being more susceptible to YCS.

Growers are urged to continue sampling soils for *Pachymetra*, prior to planting. The only option for controlling *Pachymetra* at present is the use of resistant varieties.

HCPSL is currently investigating the use of biofumigant plant species in the fallow period, however this research is not completed at this stage.

In 2022, 75 *Pachymetra* soil samples were sent away to the SRA Tully lab for analysis through the HCPSL office.

A significant number of samples have *Pachymetra* levels above the economic threshold where yield losses can be expected, and this is very concerning.

HCPSL offers a soil testing service to assess soils for the incidence of *Pachymetra*.

CANEGRUBS

Levels of canegrub damage were very low in historically impacted areas due to a combination of good farming practices and the significant use of imidacloprid products.

RATS



2022 will be remembered as a rat plague year. Rat damage was being noticed in March 2022 and got progressively worse as the year went on.

Two mild wet seasons (2021 and 2022), a heavily lodged crop with weeds emerging through the cane and cane that had been laying on or near the soil surface allowed rats to gnaw away at the crop to be harvested.

Hundreds of tonnes were lost, and the CCS was severely impacted with some blocks not reaching 6 CCS.

HCPSL and CANEGROWERS worked together to secure permits for ground and aerial baiting. Growers took the advantage to control rat populations with over 2000 ha being baited during the year.

Media crews visited the region to capture stories and take photos of the rat impacted fields. Stories made headline news across Australia, the USA and the UK.

Growers are urged to continue an Integrated Pest Management approach consisting of habitat and in-crop management to control weeds and strategic baiting as required.



Rat damage in cane

FERAL PIGS

The Hinchinbrook Community Feral Pig Management Program (HCFPMP) HCFPMP has been successful in getting numbers of feral pigs down with just over 1200 feral pigs being taken out in 2022.

The program has now been operating for 14 years. The cane industry through HCPSL, Hinchinbrook Shire Council (HSC), Forestry Industry, Terrain NRM, Greening Australia, Australian and Queensland Governments currently fund the activities of the program.

The HCFPMP utilises trapping, aerial shooting and 1080 baiting to manage feral pig numbers. Dogging has been found to be less effective and tends to disperse pigs across a landscape with very limited effect.

Approximately 60% of the feral pigs euthanised by the program has been through 1080 baiting activities.

Aerial shooting along the coastline adjacent to Halifax Bay National Park euthanised 64 pigs in June and 52 pigs in November 2022.

Growers are advised to get actively involved and assist with the baiting and trapping program. Growers needing assistance with

trapping and baiting activities are urged to contact:

David Bacchiella
Feral Pig Management Officer with the HSC
Mobile: 0458 764 660
Phone: (07) 47764607

Herbert Tonnes Pig Damage	
Years	Tonnes lost
2012-13	32059
2013-14	12599
2014-15	6044
2015-16	6373
2016-17	5576
2017-18	10837
2018-19	15299
2019-20	11580
2020-21	11755

RED STRIPE TOP ROT

In 2022, this disease was noticed in nine blocks during February and March. The disease is caused by a bacteria called *Acidovorax avenae* ssp. *Avenae*. The typical symptoms include red leaf stripes and/or a top rot. There is usually a foul odour associated with the base of the dead spindle leaf. The disease can be transmitted by machinery and has been found on land that grew blady grass in its virgin state. The impacted stalks usually die, and the remaining stalks will continue to grow. The disease is favoured by warm moist weather and tends to be seasonal. Impacted blocks may not experience the disease in subsequent years. The disease is managed by resistant varieties. In 2022 the disease was noted in the following varieties - Q231, Q232, Q242, Q247 and SRA36. The disease is of minor importance and does not usually lead to significant yield reductions.



Red Stripe Top Rot

INTERACTION WITH OUR YOUTH COMMUNITY

This year some of our HCPSSL staff went back to School. Staff showcased what types of jobs are available in the sugarcane industry and introduced the school children to tissue culture sugarcane.

Four to five tissue culture cane plants were provided to schools visited during the year. The school children planted the tissue culture cane at their schools, allowing them to nurture and love them. A new section at the 2023 Ingham Show Cane Display will be created for the schools to enter their fully grown tissue culture cane. The tissue culture cane school's competition is a way to create interest in the industry and develop an understanding of the crops management.

HCPSSL worked with students from Prep/Kindy through to Year 12. One of the highlights of the visit was being able to see how much our younger generation do know about the industry. Seeing them interested in the industry that is the backbone of our community was encouraging.

HCPSSL attended the "Future in Hinchinbrook Day 2022" which allowed the Company to showcase what services it provides for the local industry. On the day HCPSSL had a "Guess the Variety Competition", showcased RSD and soil testing methods to school children who visited the display. Event organisers stated that the HCPSSL display was one of the interactive and frequent visited displays on the day.

As an organisation HCPSSL encourages young people to seek jobs in the industry and learn more about the crop that they see every day when going to and from school.

If you have a young person in your family who is interested in doing work experience with HCPSSL, please contact your school careers officer to arrange it.

For more information on the Tissue Culture cane school competition please contact Rhiannan Harragon on 47761808.



Gilroy students participating in classroom interactions



Students at Mt Fox School learning about the Sugarcane Industry

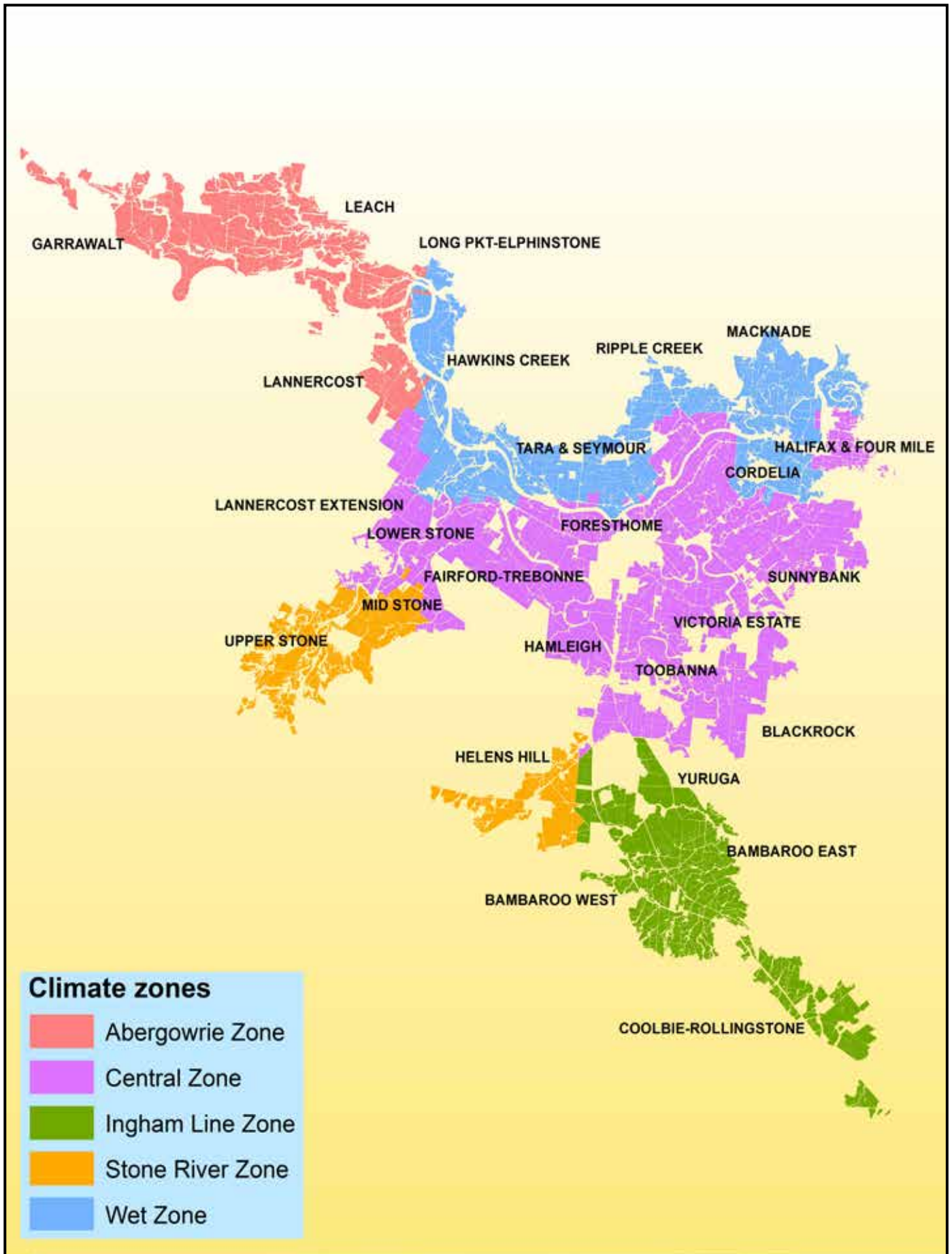


Students at Gilroy Santa Maria College planting tissue culture cane for the 2023 Ingham Show competition



HCPSSL Staff at the Future in Hinchinbrook Day 2022

CLIMATE ZONES



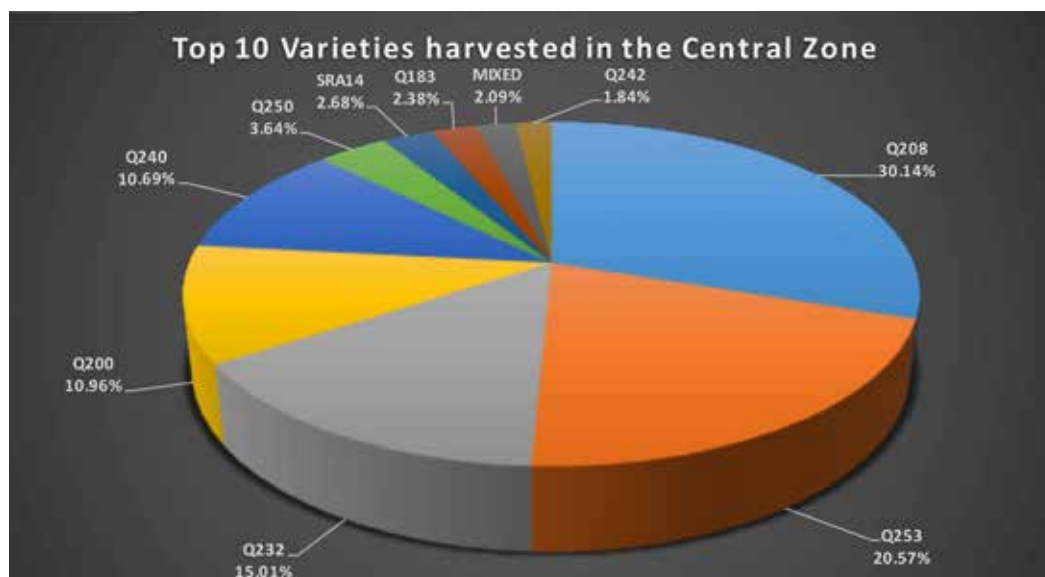
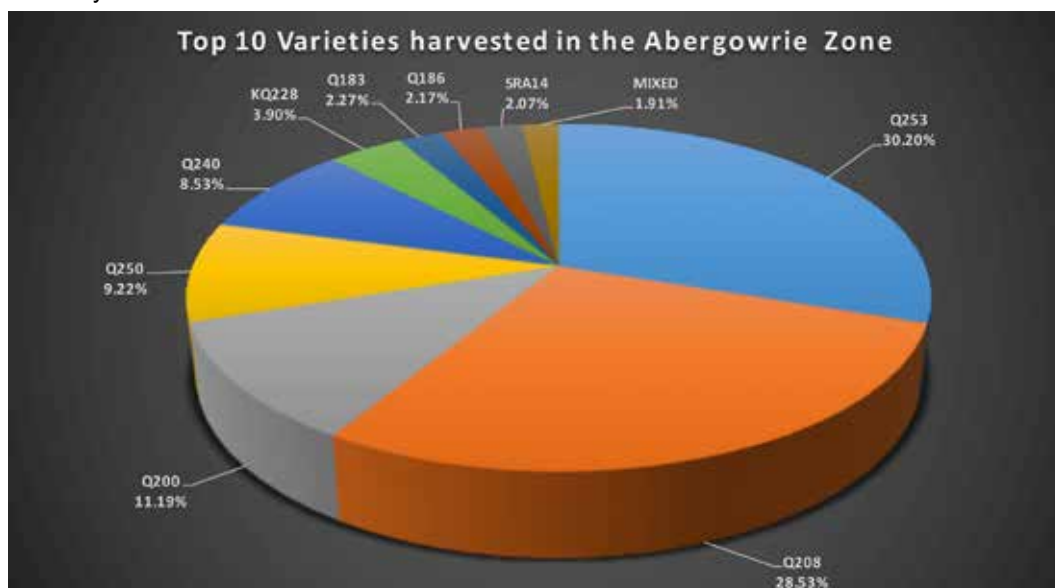
CLIMATE ZONES

Research undertaken identified five climate zones existing in the Herbert cane growing region. These geographic areas are as follows:

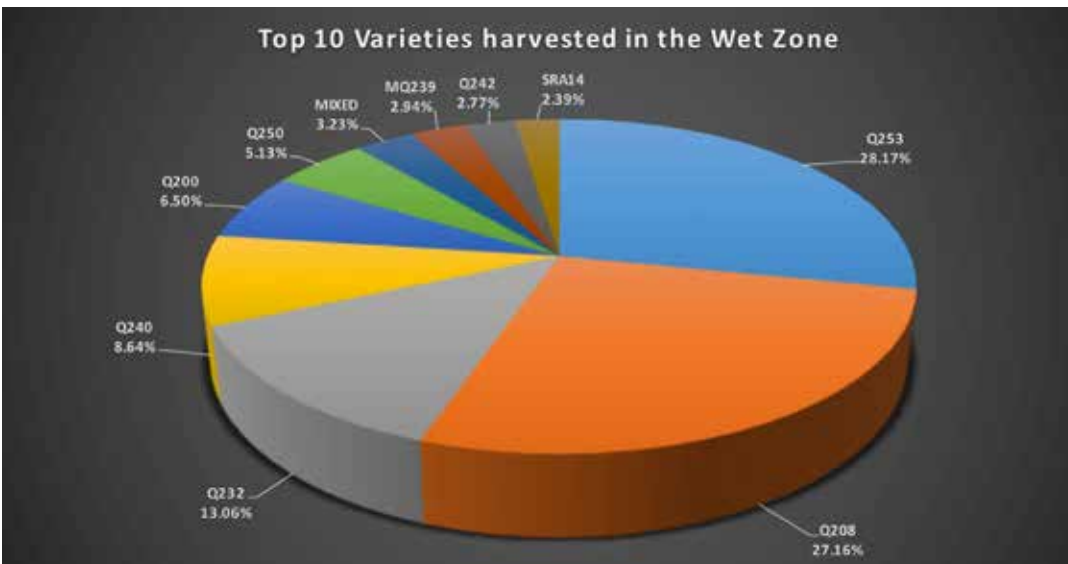
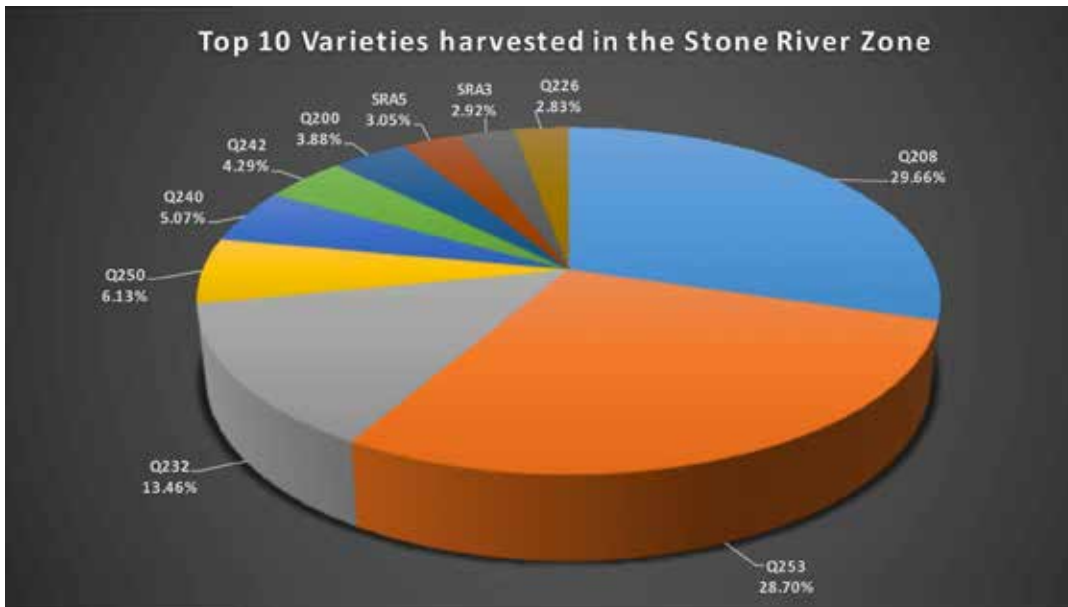
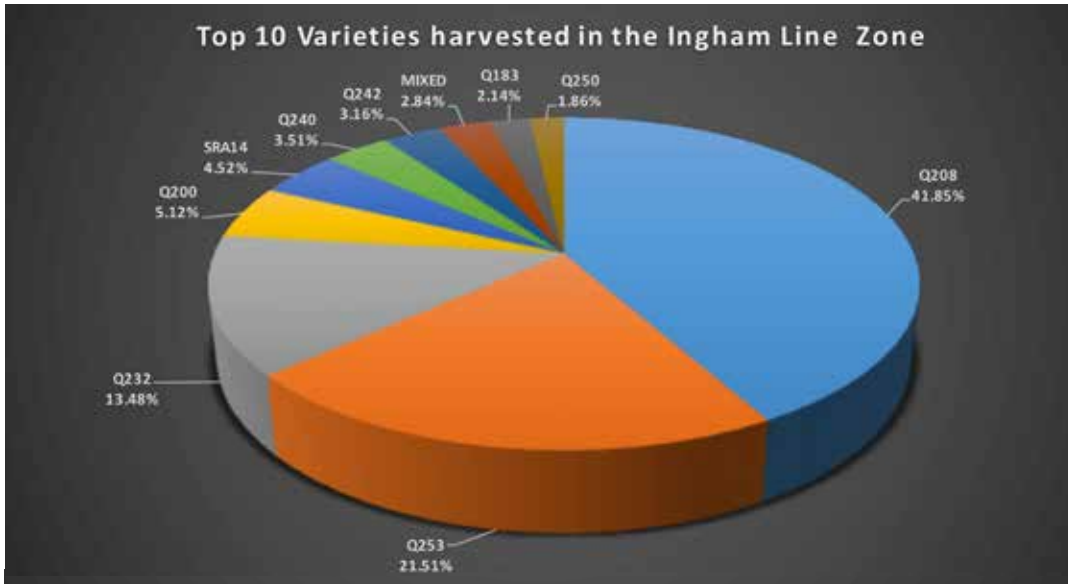
1. Wet Zone (blue): This zone includes part of the Wet belt and northern reaches of the Lower Herbert productivity region.
2. Abergowrie Zone (pink): This zone mainly consists of the Abergowrie productivity zone.
3. Stone River Zone (orange): This zone includes the Stone River productivity region and the area around Helens Hill that is considered part of the Ingham Line.
4. Ingham Line Zone (green): This includes the Ingham Line productivity region as well as the southern parts of the central productivity region.
5. Central Zone (purple): This includes parts of every productivity zone but the majority of the Central and Lower Herbert productivity zones.

The Wet zone had the highest rainfall in summer, autumn and winter. The Abergowrie and Stone River zones have the lowest spring and summer rainfall. However, the Stone River and Ingham Line zones had the lowest autumn and winter rainfall, with the Abergowrie zone having higher rainfall than either. This difference in rainfall in autumn is one of the main reasons for differentiating the Abergowrie and Stone River zones. Summer rainfall in the Central zone is more similar to the Wet and Ingham Line zones than the low summer rainfall associated with the Abergowrie and Stone River zones. The spatial variation in radiation was lower than the spatial variation in rainfall both within and between climate zones. The most evident difference was high radiation in the Ingham Line zone in each season and the low solar radiation in the Abergowrie zone in summer. There were little obvious differences between the climate zones when the maximum daily temperature was considered. However, the Abergowrie and Stone River zones had the lowest maximum daily temperatures.

Q208 and Q253 are the major varieties in all climate zones. Q240 is suitable to wetter climate zones, but generally does not handle the drier conditions experienced in the Stone River and Ingham Line zones. Q232 is also grown widely across the district, except in the Abergowrie zone. Q200 continues to be a major variety in the Abergowrie area and fertile alluvial soils along creek and river systems.



CLIMATE ZONES



HERBERT CANE PRODUCTIVITY SERVICES LTD

STAFF MEMBERS



HCPSL CORE STAFF



Lawrence Di Bella
Company Manager
0448 084 252



Peter Timms
Commercial Services Manager
0490 887 332



Sue Beccaris
Senior Administration Officer
07 4776 1808



Sandra Coco
Resource Officer
07 4776 1808



Richard Hobbs
Senior Extension Agronomist
0400 544 301



Tony McClintock
Senior Field Agronomist
0447 304 963



Jason Caruso
Field Agronomist
0417 622 129



Rhiannan Harragon
Field Agronomist
0428 746 079

HCPSL PROJECT STAFF



Adam Royle
Senior Extension Agronomist
0417 610 446



Ellie McVeigh
Extension Agronomist
0491 149 245



Jarrod Sartor
Extension Agronomist
0499 034 968



Megan Zahmel
Extension Agronomist
0447 317 102



Graeme Holzberger
Senior Extension Agronomist
0428 761 808



Bethany Donker
Extension Agronomist
0409 077 176



Rod Nielson
GIS Officer
07 4776 1808



Melissa Royle
Admin Support Officer - Projects
07 4776 1808