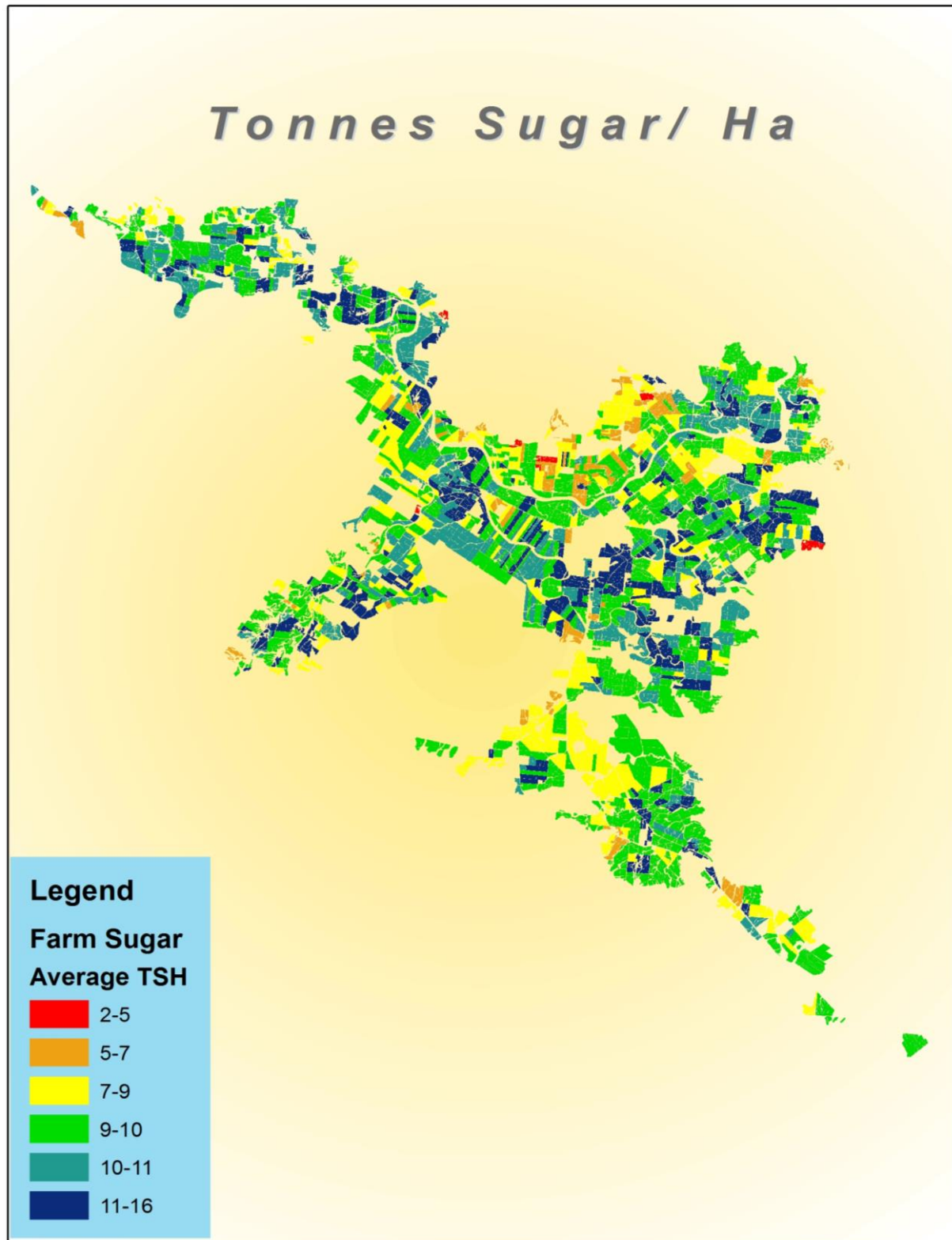
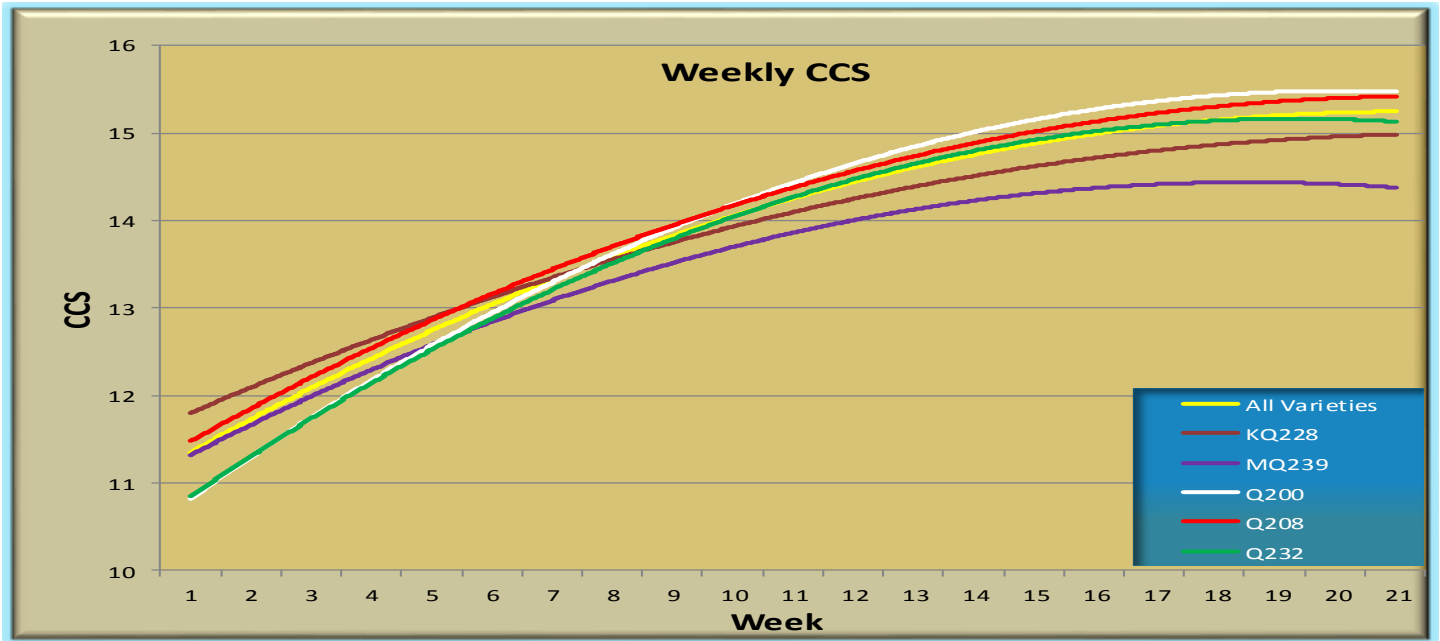




HERBERT SUGAR INDUSTRY REPORT 2013



CROP PERFORMANCE 2013



The 2013 district average yield was 74.06 tchp with a ccs average of 13.95. The high ccs average was the highest for 10 years. The high ccs could be attributed to the dry harvest and erect crop. The district cane yield of 74.06 tchp is still below industry expectations (especially following an ideal wet season). 2013-14 saw the return of MIS tree land back into sugar cane production.

The impact on cane yield due to Yellow Canopy Syndrome (YCS) was difficult to determine, however yield reduction was experienced on some cane blocks. Blackrock, Victoria Estate, Toobanna and Long Pocket-Elphinstone areas had the highest tonnes cane and tonnes sugar per hectare figures due to good rainfall early in the crop's development. Q200^h had low ccs figures (especially Toobanna South) early in the season, some may be attributed to the impact of YCS.

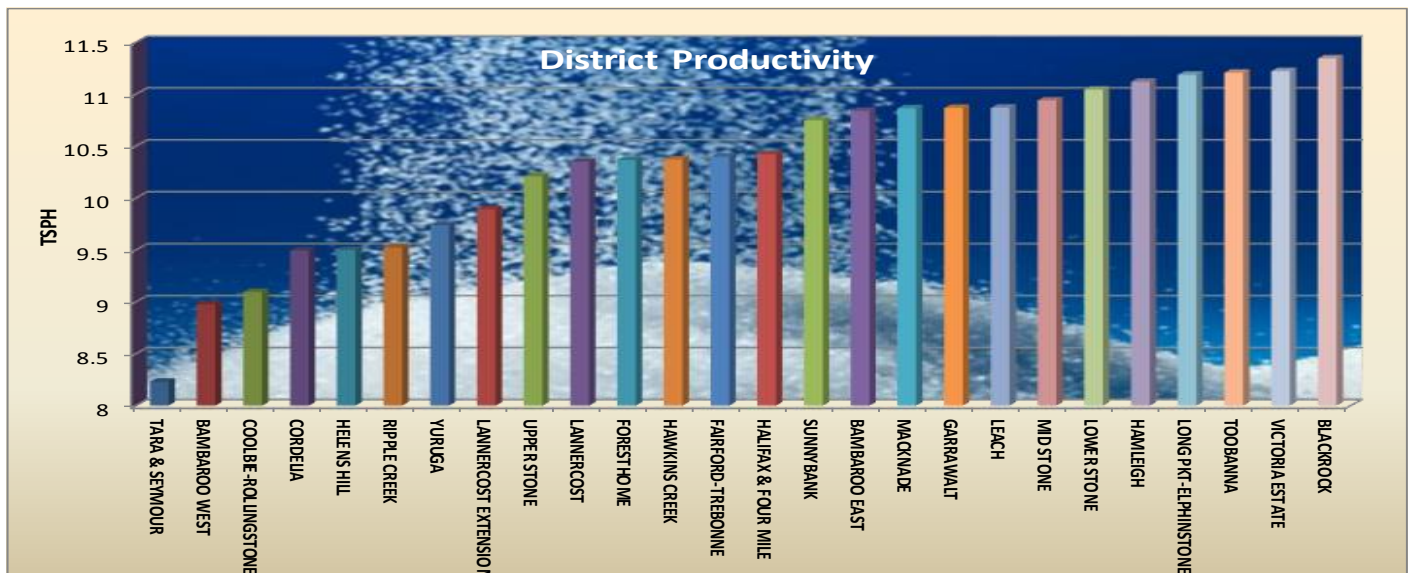
HISTORICAL DATA

Year	Tonnes	Ha Harvested	CCS	Cane Yield	Sugar Yield
1994	3888137.31	46730.02	14.74	83.20	12.27
1995	4908214.85	50051.86	13.05	98.06	12.80
1996	5251285.67	53513.30	13.21	98.13	12.96
1997	5272421.61	57328.33	13.37	91.97	12.29
*1998	4191272.31	48669.90	11.46	86.12	9.87
**1999	4151741.51	59955.95	12.73	69.25	8.81
2000	2802049.39	58379.16	13.01	48.00	6.24
2001	3311004.97	56876.94	14.34	58.21	8.35
2002	4243591.27	54892.20	14.40	77.31	11.13
2003	4051558.05	56975.69	13.90	71.11	9.89

Year	Tonnes	Ha Harvested	CCS	Cane Yield	Sugar Yield
2004	4641372.86	56410.75	13.56	82.28	11.16
2005	5553359.05	57078.93	13.11	97.29	12.76
2006	4900084.45	57658.50	12.62	84.98	10.72
2007	4287010.73	57158.66	13.84	75.00	10.38
2008	4688595.64	55061.21	13.54	85.15	11.53
2009	3920941.21	51171.33	14.79	76.62	11.33
*2010	3274402.07	39567.98	12.85	82.75	10.64
**2011	2920400.98	52364.64	12.89	55.77	7.19
2012	3625680.08	50394.18	13.57	71.95	9.77
2013	4000685.4	54017.57	13.95	74.06	10.33

* Standover Left

** Standover Harvested



YCS – YELLOW CANOPY SYNDROME

The Mulgrave Mill area north of Cairns was first to observe YCS in late 2011. By November 2012, the Herbert cane industry saw its first cases of YCS. The Burdekin area also found its first cases of YCS in 2013.

By February 2013 there were large areas in Toobanna South impacted with this mystery syndrome; with the Pappin's Road area the most severely impacted. By April severely impacted blocks had poor growth rates, even though the wet season was ideal for cane growth. In April some severely impacted YCS blocks exhibited very poor root system development. YCS like symptoms were also now being observed in other grasses at this time throughout the district by April.

In April 2013, Burdekin Productivity Services (BPS) and HCPSL invited BSES and SRDC senior staff to a meeting in the Burdekin to highlight the issue and to seek research funding to investigate the causal agent of YCS. By June 2013, YCS was being noticed in crops throughout the district. To date most varieties have been observed with YCS, including historical canes (like Badila, HQ409, Triton and Pindar) and wild canes found in the local plant breeding collection and in the local river systems.

By mid-2013 SRDC, BSES and the Queensland Government had funded a major research project into YCS. The research project is funded until mid-2014. This project will attempt to identify the causal agent of YCS and develop appropriate management strategies. Queensland Government Ministers John McVeigh (Minister for Agriculture) and Andrew Cripps inspected first hand blocks impacted by YCS in the Helen's Hill area on the 27th of July, 2013. Mr. Bob Katter, Federal Member for Kennedy also inspected YCS fields in mid 2013.

During 2013 research trials indicate that some of the severely impacted YCS blocks possibly experienced yield losses up to 30%. It was very difficult to quantify the impact on CCS caused by YCS, however historically low early CCS was experienced in Toobanna south when harvesting commenced in June. SRA, HCPSL and BPS have been working on numerous fronts to identify the YCS causal agent, however to date no solution has been found.



**Typical Leaf
Symptoms of
YCS**

FERAL PIGS

Feral pigs continue to cause significant impact to the cane crop and cane farm infrastructure (like drains and headlands). The management of the pest is difficult due to the landscape in which the feral pig inhabits, the varying success of hunting, baiting and trapping activities and the overall intelligence of the pest being managed. HCPSL has calculated estimated crop losses associated with feral pig damage in the Herbert in the following table. These figures do not take into account the financial losses incurred with damage caused to drains and headlands.

Estimated cane loss (\$) associated with feral pig damage in the Herbert.

Year	Estimated loss (\$) in income
2009	\$ 1, 190,000
2010	\$ 719,000
2011	\$ 570,000
2012	\$ 504,000

Figures are based upon a sugar price of \$40/t of cane

The Herbert Feral Pig Management Program (HFPMP) was successful in removing large numbers of feral pigs since the program commenced in 2009. This program is co-funded by HCPSL, Terrain NRM, Hinchinbrook Shire Council and the Queensland Government. In the Herbert, community partners have invested in managing this pest through a coordinated regional approach and research. The group utilizes a multiple approach to manage feral pigs within the landscape.

SRDC (now SRA) funded a Grower Group project that has been operating in the region for a two year period. This project looked at alternative bait supplies, alternative baiting techniques, genetic mapping and a number of other activities.

The use of sodium fluoroacetate (1080) baiting method proved to be the most effective method in controlling feral pigs in the project area. Bananas and mangos have been found to be the best carrier for 1080. The 1080 is injected into the bananas and mangos prior to being dispatched to the field.

The research undertaken by the SRA Grower Group project and the wider Hinchinbrook Feral Pig Management program concluded that 1080 baiting accounts for over 55% of pigs killed, with the remaining 41% being due to trapping and 4% due to dogging practices, during the period of the 30th of June, 2012 and the 1st of July, 2013 in the Hinchinbrook Shire.

Doggers continue to disrupt both feral pig trapping and baiting efforts in the area. In some cases doggers bluntly ignore trespassing and baiting signs allowing their dogs to come into contact with 1080 baits. The HFPMP believes that doggers have their place in a feral pig management program, however trespassing and interfering with trapping and baiting activities is not acceptable.

If you need assistance with feral pig management on your cane farm please contact David Bacchiella on 04587646600.

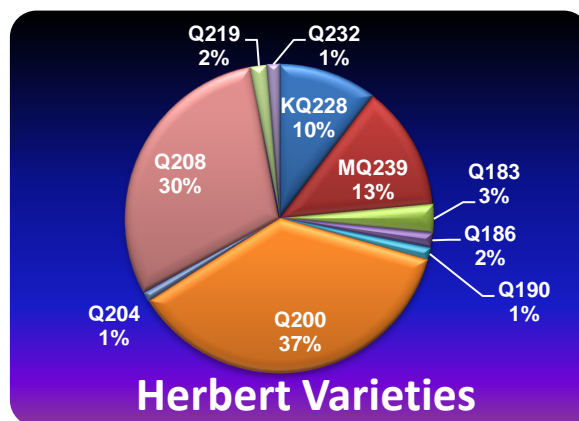
RATS

The region also saw significant rat activity throughout November and December due to the very dry conditions and lack of grasses present causing rats to consume cane. The cane industry is only one of two industries that has in place an area wide permit to control rats (which are a native species). The industry permit is due to Productivity Services Groups (between Sarina and Mossman) and CANEGROWERS working together with Queensland Government to establish and maintain an industry permit to rat bait. As a part of the permit **growers must report** through their local productivity services rat damage and where and when rat baits were used. Failure of industry to provide this data to State Government will jeopardise any future opportunities for industry to obtain a permit to bait. At present the industry is only permitted to use RATTOFF and Racumin baits within a cane crop.

VARIETY PERFORMANCE & RECOMMENDATIONS

Several factors conspired to produce a year of mixed results for the Herbert in 2013. While the estimate for the Lower Herbert plummeted due to flooding in January, Abergowrie, for the most part, produced a good crop. Ingham Line and Stone River also had their share of mixed results with yellow canopy syndrome and the prolonged dry ending to 2012 being the main factors. District wide the Herbert fell across the line with respect to its estimate crushing a little over four million tonnes. Despite some very low ccs readings early in the season, ccs was again solid with Q200[Ⓢ] and Q208[Ⓢ] leading the way. Despite some very poor results in other sub-districts, KQ228[Ⓢ] continued to perform in the Abergowrie area with some outstanding results both early and mid-season.

The biggest disappointment was the productivity of MQ239[Ⓢ] with ratoons on clay soils suffering heavily from the dry conditions at the back end of 2012. On a brighter note Q232[Ⓢ] crops looked promising in 2013. With most material planted as seed cane however we will have to wait until 2014 to see if that can be converted into commercial productivity. Although 2013 was another disappointing year for many growers, looking forward there are a number of positives that can be taken from it. The early finish to the 2013 harvest, a record amount of approved seed distributed from the HCPSSL seed plots, potential for six new varieties for the 2013 - 2014 seasons and the establishment of two new regional varieties trials are all positive investments in our industry's future.



TCH Plt & 1 Rat	Q200	Q208	Q232	KQ228	MQ239
Alluvial	96.6	94.8	102.4	99.5	96.7
Terrace loamy	88.1	90.3	92.2	86.8	87.4
Clay	79.2	82.0	91.5	72.2	80.9
Hillslope	71.3	79.4	85.6	64.1	68.2
Seymour	70.0	74.2	109.2	91.3	73.4
Sandy	88.3	84.6	88.9	75.5	80.3

Herbert Recommended Varieties x Soil Type			
Dry Zone		Wet Zone	
Terrace Loamy Soils	Q183 [Ⓢ] , Q200 [Ⓢ] , Q208 [Ⓢ] , KQ228 [Ⓢ] , Q237 [Ⓢ] , Q238 [Ⓢ] , Q240 [Ⓢ] , Q250 [Ⓢ]	Alluvial Soils	Q183 [Ⓢ] , Q200 [Ⓢ] , Q208 [Ⓢ] , KQ228 [Ⓢ] , Q237 [Ⓢ] , Q240 [Ⓢ] , Q247 [Ⓢ] , Q250 [Ⓢ]
Clay Soils	Q200 [Ⓢ] , Q208 [Ⓢ] , Q215 [Ⓢ] , Q232 [Ⓢ] , Q226 [Ⓢ] , Q238 [Ⓢ] , Q240 [Ⓢ] , Q242 [Ⓢ] , Q253 [Ⓢ]	Terrace Loamy Soils	Q183 [Ⓢ] , Q200 [Ⓢ] , Q208 [Ⓢ] , KQ228 [Ⓢ] , Q237 [Ⓢ] , Q238 [Ⓢ] , Q240 [Ⓢ] , Q247 [Ⓢ]
Sandy Soils	Q200 [Ⓢ] , Q208 [Ⓢ] , Q215 [Ⓢ] , Q219 [Ⓢ] , Q226 [Ⓢ] , Q232 [Ⓢ] , MQ239 [Ⓢ] , Q238 [Ⓢ] , Q242 [Ⓢ] , Q253 [Ⓢ]	Clay Soils	Q183 [Ⓢ] , Q190 [Ⓢ] , Q200 [Ⓢ] , Q208 [Ⓢ] , Q226 [Ⓢ] , KQ228 [Ⓢ] , Q232 [Ⓢ] , MQ239 [Ⓢ] , Q231 [Ⓢ]
Hill Slope Soils	Q200 [Ⓢ] , Q208 [Ⓢ] , Q215 [Ⓢ] , Q219 [Ⓢ] , Q226 [Ⓢ] , Q232 [Ⓢ] , MQ239 [Ⓢ] , Q238 [Ⓢ] , Q240 [Ⓢ] , Q242 [Ⓢ] , Q253 [Ⓢ]	Seymour Soils	Q200 [Ⓢ] , Q208 [Ⓢ] , Q215 [Ⓢ] , Q219 [Ⓢ] , Q226 [Ⓢ] , Q232 [Ⓢ] , MQ239 [Ⓢ] , Q242 [Ⓢ] , Q253 [Ⓢ]
Varieties Displaying Tolerance of Sodic Soils		Q138, Q215 [Ⓢ] , Q226 [Ⓢ] *	

Note – Recommendations for Q226[Ⓢ], Q231[Ⓢ], Q240[Ⓢ], Q242[Ⓢ], Q247[Ⓢ], Q250[Ⓢ] and Q253[Ⓢ] are based on limited information

DISEASE RATINGS FOR RECOMMENDED VARIETIES IN THE HERBERT

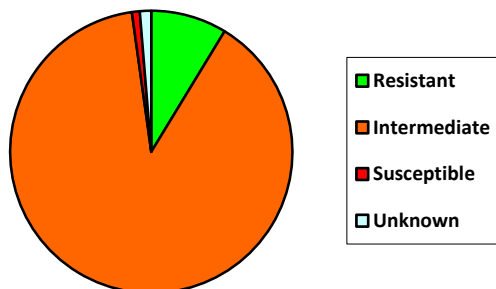
	Brown rust	Chlorotic streak	Leaf scald	Orange rust	Pachymetra root rot	RSD	Red rot	Smut	Yellow spot	
Q183 [Ⓢ]										Q183 [Ⓢ]
Q200 [Ⓢ]										Q200 [Ⓢ]
Q208 [Ⓢ]										Q208 [Ⓢ]
Q215 [Ⓢ]										Q215 [Ⓢ]
Q219 [Ⓢ]										Q219 [Ⓢ]
Q226 [Ⓢ]										Q226 [Ⓢ]
KQ228 [Ⓢ]										KQ228 [Ⓢ]
Q231 [Ⓢ]										Q231 [Ⓢ]
Q232 [Ⓢ]										Q232 [Ⓢ]
Q237 [Ⓢ]										Q237 [Ⓢ]
Q238 [Ⓢ]										Q238 [Ⓢ]
MQ239 [Ⓢ]										MQ239 [Ⓢ]
Q240 [Ⓢ]										Q240 [Ⓢ]
Q242 [Ⓢ]										Q242 [Ⓢ]
Q247 [Ⓢ]										Q247 [Ⓢ]
Q250 [Ⓢ]										Q250 [Ⓢ]
Q253 [Ⓢ]										Q253 [Ⓢ]

= Resistant
 = Intermediate
 = Susceptible
 = Unknown/In Trial

VARIETY PERFORMANCE & RECOMMENDATIONS

PACHYMETRA ROOT ROT

In our pre-smut world, the Herbert was well equipped with several good pachymetra resistant varieties. Since then there has been a distinct trend away from resistance and a lean towards many varieties that have only an intermediate rating. The effects of this change are only now starting to be seen with many Pachymetra soil samples returning moderate – high spore counts. Fortunately the list of resistant varieties is steadily growing again but growers still need to be vigilant to avoid productivity losses. A detailed list of recommended varieties and their pachymetra resistance ratings can be found in the variety section of this report.



Current pachymetra root rot resistance levels in the Herbert by area harvested in 2013.

NEW VARIETIES

Three new varieties will be discussed at the 2014 Herbert Variety Adoption Meeting for approval.

Q226^{ph} (Q138 x CP57-614)

2014 release: Q226^{ph} comes from the SRA Central Plant Breeding Program and is resistant to smut, leaf scald, yellow spot, red rot and orange rust. Q226^{ph} also has intermediate resistance to ratoon stunting disease (RSD), brown rust and Pachymetra root rot (Pachymetra) therefore growers will need to manage these diseases through block rotation, clean seed material and hygiene. In Central trials Q226^{ph} has been shown to suit poor environments and soil types, including sodic soils. Material will be available from HCPSL in 2014.

Q250^{ph} (QN97-183 x QN89-1043)

2014 release: Q250^{ph} comes from the SRA Northern Plant Breeding Program. Q250^{ph} is resistant to smut and leaf scald and has intermediate resistance to red rot and Pachymetra therefore block rotation with a resistant Pachymetra variety is recommended. It has shown to have high CCS in northern trials and has been observed in the Herbert Final Assessment Trials (FATs) to be a good germinator. So far maturity trends suggest it be harvested in the mid-late season. Material will be available from HCPSL in 2014.

Q253^{ph} (Q120 x CP57-614)

2014 release: Q253^{ph} comes from the SRA Burdekin Plant Breeding Program. Q253^{ph} is resistant to most of the major diseases present in the Herbert region, including smut and Pachymetra. It has intermediate resistance to brown rust which should be taken into account when considering this variety for planting. Material will be available from HCPSL in 2014.

Promising varieties for the future

There are numerous varieties in current trials that show great promise as future commercial varieties for the Herbert industry in particular Q246^{ph}, Q252^{ph} and QS00-2319. One promising variety we are following closely from the SRA Herbert Plant Breeding Program is QH02-1041.

New varieties approved at the 2013 Variety Adoption Meeting available to trial on your farm this year

Q240^{ph} (QN81-289 x SP78-3137)

2013 release: Q240^{ph} comes from the SRA Southern Plant Breeding Program and provides resistance to such disease as smut, RSD, leaf scald and orange rust. It is also intermediate to Pachymetra and chlorotic streak disease therefore block rotation with a resistant Pachymetra variety and using clean seed material is recommended. Q240^{ph} offers a moderate CCS with moderate to high yields and in trials has been shown to suit a wide range of soil types and environments. It is currently recommended for average to better soils in both the wet and dry regions. Material will be available from HCPSL in 2014.

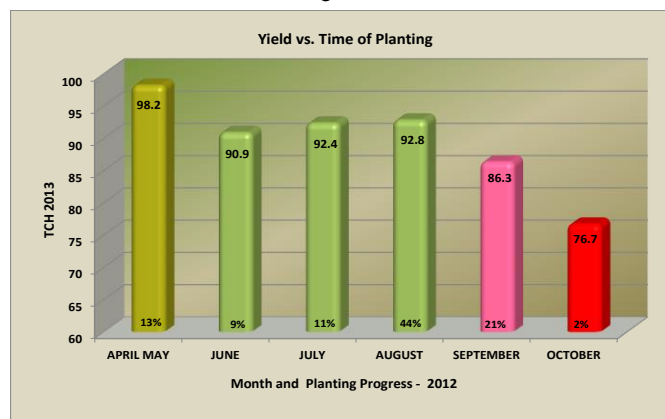
Q242^{ph} (Q170^{ph} x Q150)

2013 release: Q242^{ph} comes from the SRA Southern Plant Breeding Program and has done well in our wet zone trial sites. It could suit wet clays where it shows above average tonnes and slightly lower CCS. Q242^{ph} is resistant to leaf scald, orange rust and Pachymetra and has intermediate resistance to smut and RSD which growers will need to manage through seed material and hygiene. Material will be available from HCPSL in 2014.

Q247^{ph} (Q138 x Q155)

2012 release: Q247^{ph} comes from the SRA Burdekin Plant Breeding Program. It is recommended for the Herbert's fertile and free draining soils although in trials it has handled average soil types with some waterlogging in both wet and dry regions. Q247^{ph} is currently resistant for most major diseases in the Herbert region however using clean seed material is still recommended. Q247^{ph} has high CCS throughout the year however it is recommended that it is harvested before heavy flowering occurs. It has been observed as a slow germinator. Material will be available from HCPSL in 2014.

Information on these three varieties can be found in the 2013/14 Herbert and Northern region Variety Guide, QCANESelect and CaneClips. These resources are available on the SRA website www.sugarresearch.com.au



VISITORS TO THE HERBERT

During 2013 the Herbert cane industry received the following official delegations to view our industry practices first hand:

- Early February - Visit by the Eversis Global CEO to view first hand controlled release trials managed by HCPSL staff and to undertake discussions with industry concerning the adoption of the technology.
- Late February - A visit by Coca Cola and Project Catalyst representatives.
- Early April - Australian Society of Sugarcane Technologists (ASSCT) conference delegates (46 delegates) visited cane and pineapple farms in the Rollingstone and Mutarnee areas.
- Late May - Agronomists from the MSF Group (from Innisfail/ Babinda) visited the region.
- Early June - The Herbert Stakeholder Group consisting of all agriculture commodity groups (cattle, dairy and mixed cropping) and the mining sector operating within the Herbert River Catchment area.
- Arrival of Joana Faure, a French based university student who undertook a 6 week internship with Terrain NRM and HCPSL in early July.
- Mid July - The Australian Pineapple Growers Conference delegates visited cane farms south of Ingham, as a part of their annual conference held at Rollingstone.
- Queensland Government Ministers John McVeigh and Andrew Cripps saw first hand the impacts of Yellow Canopy Syndrome (YCS) in the Helen's Hill area in late July.
- Early August - Wilmar Agricultural Services Group from Malaysia and Sarina.
- Mid August - YCS scientific reference panel visited the region to view first hand the syndrome and oversee the research project activities.
- Early September - A visit from Narendranth Andhra Sugar group India, hosted by the local branch of the Queensland Mechanical Harvester Association.
- Mid September - A visit by a Japanese sugar purchasing company, hosted by QSL.
- Late September - A visit by a Brazilian sugar industry delegation, hosted by John Deere.
- Mid November - Technical and extension staff from numerous Northern Productivity Services Groups and Government agencies attended the Herbert Sustainable Farming Systems Group meeting and Hinchinbrook NRM forum. Over 100 personnel attended both these events. These two events showcased the research and development that the Herbert cane industry is involved with.
- Late November - Wilmar Agricultural Services Group from Sarina.



Ministers John McVeigh and Andrew Cripps

2012 HERBERT SUGAR INDUSTRY AWARDS

Award	Recipient
Grower of the Year (Sponsored by HCPSL)	Zatta, G, AJ, RA & JP
Young Grower of the Year (Sponsored by QSL)	Daryl Larsen
Mangrove Jack Award (Sponsored by Herbert River Catchment Group)	Vince Vitale
QMCHA Harvesting Efficiency Award	Chinotti & Sons
Innovation Award (Sponsored by HRIC)	Alan Lynn
Farm Presentation Award (Sponsored by CAMECO)	S. Fortini Holdings
Improved Farm Layout Award (Sponsored by Canegrowers Herbert River)	Sartor, S & M & Sons
Consistent High Productivity (Sponsored by QSL)	Irlam, GC & JM Kirkwood, RW Zatta, RV & G Finlayson, B & C La Rosa, A & AM Tua, ES & CM
R&D On-farm Co-operation (Sponsored by HCPSL)	Low, TJ & GP Girgenti, A & A Hobbs, AE & W Quabba, R, C & P Lenzo Farming

NEW NRM PLAN AND WHOLE OF REGION WQIP FOR THE WET TROPICS

2014 is a big year for Terrain NRM with the both the update of the Wet Tropics' Natural Resource Management (NRM) Plan and the development of a Water Quality Improvement Plan (WQIP) for the whole Wet Tropics region. The role of the NRM Plan is to identify regional objectives and priorities based on community values and the best available knowledge, facilitate partnerships, stimulate action, attract investment and provide land managers with tools and information to help them manage what is valued in the region. This is not a government plan but fundamentally a community plan highlighting the community's priorities for funding and action in the region.

As a result, the development of the plan requires extensive input from the stewards of the land - the Wet Tropics community. As such, the NRM planning timeline includes a period of intensive community engagement. This is scheduled for the period March to June 2014 and will include workshops, forums and meetings. At the same time as the NRM planning process, Terrain will also be working with research organisations, government agencies, Traditional Owners and regional stakeholders to develop the *Wet Tropics' Water Quality Improvement Plan* (WQIP).

The WQIP is designed to identify the main issues impacting waterways and the marine environment from land-based activities and to identify and prioritise management actions that will halt or reverse the trend of declining water quality within an NRM region. This is done, using a wide range of existing resources and scientific data, identifying the following:

- issues affecting water quality
- waterway uses and values
- management goals and objectives
- ways to monitor and assess effective management

The program will also help to build the long-term partnerships necessary for the implementation of the Plan.



WOOLWORTH FRESH FOOD PROGRAM AND LANDCARE PROJECT

HCPSL is one of eleven farming groups across five states to have received a funding boost as a result of a series of recent grants offered in 2012, through the Woolworths and Landcare Australia partnership. The project aim was to develop a more robust sugarcane farming systems that uses sugar mill by-products, such as mill mud and mill ash, more efficiently throughout the Herbert River cane growing region. The project aimed to increase local industry awareness on best nutrient management using both organic by-products and inorganic fertilisers.

Trials were established to assess the impact of reduced mill mud and ash treatments on a range of soils. The trial results are as follows:

Foresthorne Trial

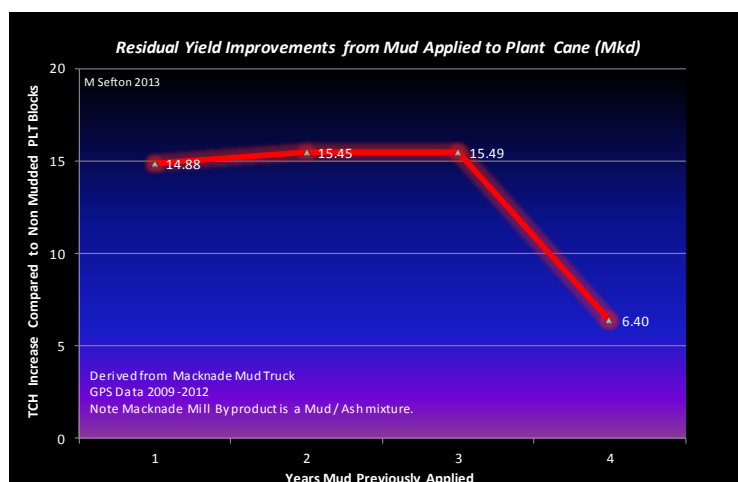
Treatment	CCS	TCPH	TSPH
Zonal application rate @ ~100 t/ha wet weight of mill mud.	14.9	90.58	13.49
Traditional application rate @ ~250 t/ha wet weight of mill mud.	14.8	91.33	13.56

The higher application costs associated with the higher rate applied (in the traditional application rate treatment) would mean that the zonal application rate would be more cost effective because of the lower rates applied in the zonal application treatments.

Hawkins Creek Trial

The zonal application rate had the highest cane yield (tcph) of 61.76, while the traditional application rate had a lower yield of 43.95 tcph. There was no difference in CCS at this site. The zonal application rate had a higher sugar yield of 8.39 tsph compared to 5.97 tsph for the traditional application rate.

Treatment	CCS	TCPH	TSPH
Zonal application rate @ ~100 t/ha wet weight of mill mud.	13.6	61.76	8.39
Traditional application rate @ ~250 t/ha wet weight of mill mud.	13.6	43.95	5.97



On Monday the 2nd of September, 2013 a field day was conducted at Stephen Gileppa's farm at Helen's Hill (south of Ingham). The event was well attended with 54 growers and industry personnel attending the event. Further information about the Woolworths Fresh Food Future program and other recently funded projects can be found on www.landcareonline.com.au

THE HERBERT SUSTAINABLE FARMING SYSTEMS GROUP (HSFSG)

The HSFSG is now a leading group consisting of industry, technical, research, extension, agribusiness, funding providers and governmental agency personnel which provides direction and focus for sustainable farming practices appropriate to the Herbert cane industry. The group encourages innovation and open dialogue between all members, with the aim of ensuring a sustainable Herbert cane industry into the future. The group met twice during 2013 at the HCPSL offices. HSFSG meetings were well attended with between 30- 55 attending.

The incentives and projects that the Group were involved with were:

- The Herbert Water Quality Monitoring Project. The HSFSG is the cane industry reference group for this project, reviewing data and develop strategies to address issues if they occur.
- The Queensland Government Department of Agriculture, Forestry and Fisheries (DAFF) funded Extension and Education (E&E) pilot project. This project built industry capacity within the region and gave extension staff an opportunity to network with extension staff from other industries (like grazing, dairy, timber and mixed cropping) within the Herbert Catchment area.
- The DAFF funded Demo farm project.
- The Everris Controlled Release fertiliser trials.
- Queensland Government funded project to investigate denitrification losses in a green cane trash blanket farming system.
- The Woolworths funded Landcare project into better use of mill mud and ash.
- HCPSL and Queensland Fisheries held a workshop on the maintenance of drains in environmentally sensitive areas.
- Support for SRA (SRDC) Grower Group projects:
 - Soybean variety trials for the Herbert, Burdekin and Central regions.
 - Improvement of internal soil drainage and yield on heavy clay soils in the Herbert.
 - Assessing the impact of compost and biochar in a cane farming system.
 - Investigating alternative feral pig baits and management strategies to manage feral pig populations.
- PA activities in relation to
 - Base station management and auto-steer
 - Yield map generation
 - Precision agriculture course, which was delivered by HCPSL and Farmacist, with funding from Terrain NRM.

All growers and other interested parties are welcome to attend or be involved in future Group activities. For more information contact Lawrence Di Bella - 0448 084252.

IMPROVEMENT OF INTERNAL SOIL DRAINAGE AND YIELD ON HEAVY CLAY SOILS IN THE HERBERT

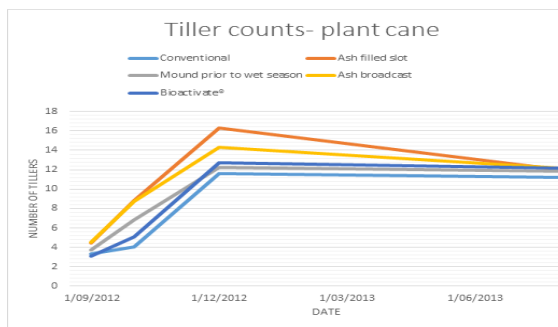
SRA funded the Lumps Grower Group project in the Trebonne/ Hamleigh area to assess different farming practices to improve the internal soil drainage and cane yields on heavy clay soils. The trial site was planted between the 4th and 5th of August, 2012 with KQ228[®].

The trial consisted of the following treatments:

1. Conventional land prep, 2. Ash filled slot and mounded pre-wet season on GPS, 3. Mound pre-wet season and zonal tillage on GPS, 4. Ash broadcast, 5. Mole drain prior to planting at a depth below row, with Bioactivate™ (a soil amendment applied).

Tiller counts

Germination (tiller counts) and establishment was noticeably better on the mill ash treatments compared to the conventional land preparation treatments from plant cane emergence to harvest.



There was a significant difference between some treatments for stalk weight and height (especially when comparing the mill ash treatments and the conventional treatment).

Harvest Results

The trial was harvested on 15/8/2013. The harvest results are as follows:

CCS: CCS levels at harvest - plant cane. The ash filled slot had the highest CCS at 14.48, with the conventional and mound prior to the wet season treatments having the same CCS of 14.3. The Bioactivate® treatment had a CCS of 14.06. The lowest average CCS was experienced in the broadcast ash treatment, with a CCS of 13.9. There was no significant difference for CCS between all treatments.

TCPH: The broadcast ash treatment had the highest cane yield at 102 tcph, followed by the ash filled slot at 87.05 tcph. The conventional and mound prior to the wet season treatments had the lowest cane yields at 73.19 tcph and 72.64 tcph, respectively. The Bioactivate® treatment had a cane yield of 78.51 tcph. The broadcast ash treatment was significantly better than all treatments and the ash filled slot was significantly better than all other treatments, except the broadcast ash treatment.

TSPH: Both mill ash treatments had the highest sugar yield (tsph) of 14.41 for the broadcast ash treatment and 12.6 for the ash filled slot. There was no significant difference between the conventional, mound prior to the wet season and Bioactivate® treatments.

Economic analysis

DAFF staff undertook an economic analysis to calculate the average gross margin for the fallow and plant cane periods for the trial. The trial results highlights that both ash treatments had the best gross margins after the plant cane harvest.

	Convention al Land Preparation	Mill Ash Filled Slot on a Preformed Mound	Mound pre Wet Season and Zonal Tillage on GPS	Mill Ash Broadcast	Bioactivate with Conventional Land Preparation
Fallow	-\$541/ha	-\$680/ha	-\$575/ha	-\$929/ha	-\$541/ha
Plant Cane	\$823/ha	\$1,358/ha	\$890/ha	\$1,759/ha	\$767/ha
Average Gross Margin	\$141/ha	\$339/ha	\$158/ha	\$415/ha	\$113/ha

Discussion

The trials indicate that there is significant opportunities to improve cane and sugar yields on heavy clay soils in the Herbert region through the use of mill ash as a soil amendment. The use of mill ash was found to enhance germination and establishment of plant cane on difficult to manage clay soils. Even though the stalk numbers were not significantly different between both mill ash treatments and the conventional farming treatment, stalk weight and height was significantly different. The use of zonal application of mill ash to the cane row will reduce the costs when compared to broadcast applications of the product.

In this trial the mill ash treatments had the highest gross margin in the plant crop. The Bioactivate™ and BioBoost™ showed no significant difference in CCS, cane and sugar yield. This treatment had a 25% lower nitrogen and potassium fertiliser input than other treatments accessed, however input costs to purchase the products need to be considered. It is proposed to harvest the trial in first ratoon crop to assess the impact of all treatments. For more information on the project contact Vince Russo on 0427 164025.

SOYBEAN VARIETY PROJECT

The final round of trials for the SRDC funded soybean variety project were planted and assessed in 2013. While some trials were badly affected by flooding and had to be abandoned, the results collected from the remaining re-enforced the findings from 2012. The trials were assessed for -

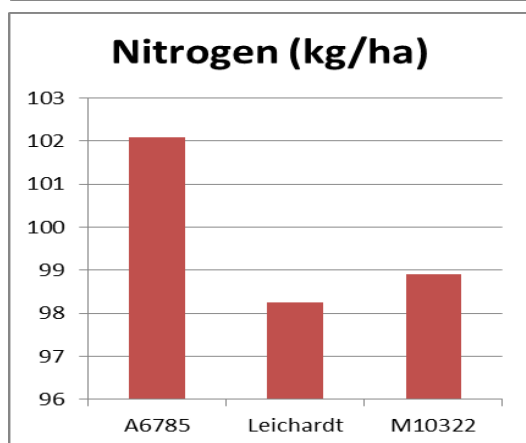
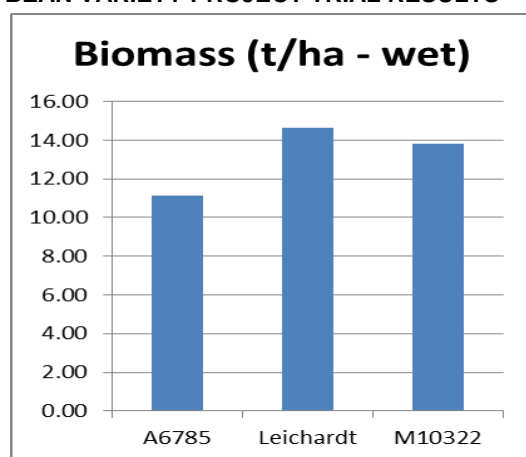
- Biomass production
- Nitrogen production
- Season length
- General crop agronomy (pests, diseases, stress tolerances etc)

Leichardt is still a strong performing variety in the district. M10322 (currently still an experimental variety) performed as well if not better than Leichardt in all trials. The highlight however was the performance of A6785. This short season variety produced 24% less biomass than Leichardt but was 12% higher in nitrogen production. Maturing several weeks earlier than Leichardt may make A6785 a valuable alternative for growers looking to remove their legume crop earlier in preparation for planting their sugarcane crop. Please contact Adam Royle at HCPSSL on 47761808 concerning this project.



Melissa Royle
and Sam Sellick
collecting legume
samples

SOYBEAN VARIETY PROJECT TRIAL RESULTS



INTEGRATED FERAL PIG MANAGEMENT FOR THE HERBERT CANE AREA - (Here Piggy Piggy!)

In 2012, the Grower Group formalised its membership with growers signing up and becoming members of the Grower Group and project. The growers in the project paid a membership fee to be a part of the group. The monies go towards paying for feral pig banana baits and employment of Ray Stallan. Ray was appointed by the project members to undertake the field research activities and to coordinate activities undertaken by the project. The project achieved the following:

- Brought together growers to focus on managing a feral pig population through collective action and developing a regional specific integrated pest management program. Management of a pest population such as feral pigs requires a coordinated approach. Individual farms attempting control have minimal impact on a population
- Assessed "Hog Gone" (sodium nitrite) baits as an alternative to 1080 baiting; as a part of an IPM program.
- Investigated feral pig genetics to determine the structure of feral pig populations and whether there are source areas of feral pig populations.
- Reduced the significant financial losses (greater than \$570,000 annually) and environmental impacts caused by feral pigs.

The Grower Group is working with the Herbert Feral Pig Management Program, HCPSSL, QUT, Animal Control Technologies Australia and the CRC for Invertebrate Pests within the project. For more information concerning this project please contact Ian Kemp - 0418771617.

ASSESSING THE IMPACT OF COMPOST AND BIOCHAR IN A CANE FARMING SYSTEM

This project has brought together the Grower Group, Herbert Cane Productivity Services Limited (HCPSSL), James Cook University (JCU) Cairns campus, SITA Organics and Renewable Carbon Resources Australia. A project site has been established at Geoff Morley's farm at Lannercost in September, 2012.

The aim of the project is:

- Assess the impact of compost and biochar amendment on low CEC soils, which are subject to significant potential nitrogen losses and are generally low in general soil nutrition.
- To investigate the opportunity for carbon sequestration associated with biochar and the opportunities that may arise if a "carbon trading" program is introduced into agriculture.
- Investigate the opportunity to produce biochar from locally sourced materials.

Harvest Data

The trial was harvested on 9/9/2013. There was no statistical difference between any treatments for TCPH, CCS or TSPH for the plant cane crop.

Plant Harvest Data

Treatment	TCPH	CCS	TSPH
No fertiliser applied	35.24	13.7	4.83
Compost @ 30.2 t/ha (nutrients supplied by the compost)	45.13	13.82	6.23
Biochar + supplementary fertiliser (58kgN/ha, 29.8kgP/ha, 90kgK/ha, 17.5kgS/ha)	57.44	14.07	8.08
Compost + biochar (nutrients supplied by the compost and biochar)	46.22	13.7	6.33
Conventional fertiliser application (123.6kgN/ha, 29.8kgP/ha, 90kgK/ha, 17.5kgS/ha)	48.40	14.0	6.76

Greenhouse gas emission results

Analysis of the current data sets shows no significant differences between treatments for Carbon dioxide and Nitrous oxide emissions for the samples taken in the trial.

For more information on the project please contact Geoff Morley on (07) 47774253.

HERBERT DEMONSTRATION FARM (2009-2013)

The Herbert Demonstration Farm was established in 2009 on the Marino Family's property at Trebonne. The project monitored agronomic, economic, and water quality aspects of two different farming systems. Located side by side, the first system is based upon Best Management / Improved Practices and the second is a system based upon Conventional practice. The site has gone through three harvest cycles and the trial has now been completed.

The results of the analysis indicate that the conventional management system benefited from lower legume fallow crop costs and a higher sugar yield in plant cane. On the other hand, the improved management system incurred lower plant cane growing costs and a higher first and second ratoon sugar yield. Overall, the average gross margin of the improved management system was \$72 per hectare (or 7% in relative terms) higher than the conventional system.

Gross Margin Comparison - Conventional Vs Improved System (\$/ha)

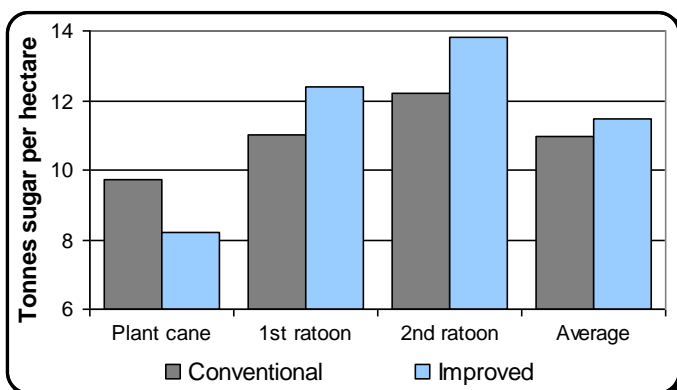
	Conventional site	BMP/ Improved site
Fallow	-\$638/ha	-\$714/ha
Plant cane	\$577/ha	\$277/ha
1st ratoon	\$2,040/ha	\$2,398/ha
2nd ratoon	\$2,128/ha	\$2,434/ha
Average Gross Margin	\$1,027/ha	\$1,099/ha

The trial data indicates that the improved management system has provided modest net economic benefits, even though at this stage the analysis lacks successive ratoon data. It is important to note the limitations of these results; this analysis involves a single-replicate trial that includes plant cane, first ratoon and second ratoon harvest data and both treatments produced historically low plant cane yields (t/ha) due to adverse effects from Cyclone Yasi. Additionally, the improved management system's plant cane yields were thought to be reduced by heavy weed pressure resulting from suspected herbicide treatment failure due to environmental conditions.

Sugar Yield Comparison - Conventional Vs Improved Systems

	Conventional site	BMP/ Improved site
Plant cane (ts/ha)	9.71	8.19
1st ratoon (ts/ha)	10.99	12.41
2nd ratoon (ts/ha)	12.20	13.80
Average (ts/ha)	10.97	11.46

Sugar Yield Comparison – Conventional Vs Improved Systems



The key learnings from the Herbert Demo farm project are -

Yield

- Differences in yield between sites are difficult to quantify due to the nature of the project design i.e. lack of replication and multiple variables, however the wider row spacing of 1.83m appears to have no negative impact in ratoons.

Legume management

- Pre-formed mounds are critical to ensure establishment and growth of legume fallow crops.
- Retaining the legume on the surface, rather than incorporating it, was successful in delaying the availability of the N in a more mobile form until the cane crop was mature enough to utilise the available N.

Nitrogen and phosphorus loss

- Nitrogen and phosphorus were detected in water samples collected from the site.
- The majority of runoff loss is associated with the first few rainfall events after application of fertilisers.
- N and P loss to runoff was lower than expected and within the acceptable range.

Pesticide loss

- Pesticides were found in runoff from both sites.
- The most significant factor affecting pollutant runoff is time between application and rain. Undertaking risk assessments in regards to proximity to rainfall events reduces risk of potential losses.

Extension

- The site has proven to be a valuable resource to demonstrate new farming and environmental monitoring systems. The site has allowed for significant discussions to occur concerning sugarcane sustainability and raising concerns about environmental issues pertaining to the industry.

Conclusions

The Herbert Demo Farm project has provided worth exceeding the expectations of all parties involved with the project. The number of people who have visited the site and the discussion concerning sugarcane farming practices and sugarcane sustainability are all positive indicators of the success for the project.

The Herbert Demonstration Farm was funded by the Queensland Government Department of Agriculture, Fisheries and Forestry with support from Terrain NRM and HCPSL. For further information please contact Rebecca Walther on 0477301419.



The Herbert Demo Farm site at Trebonne

CONTROLLED RELEASE FERTILISER TRIALS

The USA based fertiliser company Everris™ approached HCPSL to assess its products in the Australian cane industry in mid-2011. HCPSL staff established the first trials in 2011. HCPSL, Farmacist and DSITA established additional trials in the Herbert, Burdekin and Mackay areas in 2012 and 2013. An Australian industry group (consisting of Lawrence Di Bella, Ash Benson, Greg Shannon, Peter Mc Donnell, Mark and Allan Poggio) also had the opportunity to review research trial and commercial use in Florida in February, 2012 on their agricultural study tour.

Research Findings

Two years of research trials in the Herbert Valley have shown significant increases in productivity and N-efficiency (t cane/kg N applied) with CR N compared to urea. Improvements in N-efficiency have been measured in seasons with both wet and dry conditions in the first two months following fertiliser application, and on heavy clay and solodic soils. In 2013, significant increases in efficiency were also measured on a flood-irrigated Burdekin-delta soil. Results from these trials indicate that not only was there an improvement in N-use efficiency, but there is also the potential to reduce N rates applied to the field without compromising productivity.

Due to the higher cost of controlled release N compared to urea, application of straight (100%) controlled release N fertiliser is unlikely to be viable. However, blends containing 15% to 40% controlled release N (80% N release over four months) with urea significantly increased net margins in the Burdekin and Herbert sites, with increased net margins of up to \$460 /ha (measured in the Burdekin). Blends with conventional urea may also improve early season growth, particularly in drier seasons. For example, sugarcane at the Wharps site appeared to show a more immediate growth response to conventional urea in the dry growing conditions, even though by harvest cane yield was significantly ($P \leq 0.05$) increased by CR N on the solodic soil at both the 120 kg N and 160 kg N/ha rate. Nitrogen is required by the crop early in the season, and therefore a blend of CR N with some uncoated N may increase early-season growth compared to CR N alone.

Nitrous oxide is a greenhouse gas and a by-product of the denitrification process. Results from the Hamleigh trial highlight the significance of the opening wet season rainfall events to denitrification. When the N fertilisers were applied in October, the soil was drier than field capacity and there were no measurable N_2O emissions. However, following rainfall events in late December, a flush of denitrification occurred. By the onset of the wet season in late-January, emissions had dropped to negligible levels, presumably because of the low levels of soil nitrate present at the time. Although the N_2O emissions from CR urea were not significantly higher than those from urea, the higher apparent trend suggests that more research needs to be done to better align mineral N release with crop demand. Conditions during the wet season in terms of water-filled pore space in the soil are conducive to denitrification, so mineral-N supply needs to be in close accord with crop requirements. An indication from this work is that technologies that increase inorganic N levels in the soil (e.g. by slowing N release rate or reducing leaching or runoff losses) may be unlikely to reduce nitrous oxide emissions.

Significant N is removed from the sugarcane farming system in harvested cane and crop residues. Thus, by increasing N-use efficiency (productivity per unit N applied) growers can reduce environmental losses because more N is taken up by

the crop and converted to cane. Future projects should measure N loss via deep drainage, runoff and denitrification from fields treated with CR N so a whole N budget can be obtained. Although N-use efficiency was increased by using CR N, and environmental losses likely reduced, the major N-loss pathways that are affected by CR N have not been identified. This work is essential to determine whether the use of CR N will improve water quality and reduce impacts on the Great Barrier Reef.

For further information concerning the Everris controlled release fertiliser products, contact Sam Stacey (Everris) - 0409970695.



Controlled Release Fertiliser Products being assessed in the Herbert

PROJECT CATALYST

Seven Catalyst trials were harvested with some very encouraging results. This is only one year's information and most of these trials have been repeated to verify these results. Two more trials were established this year for harvest in 2014.

Skip Row trials have shown that dollars return per hectare are slightly lower than conventional planting. These trials are continuing to evaluate potential benefit in older ratoons and possible benefit when skipped rows are planted.

Variable Rate Nutrient Application within blocks has shown cost savings with no loss of productivity in plant cane. This has been repeated in 1st ratoon crop and will be harvested in 2014.

A trial to assess minimal tillage practices of existing control traffic beds prior to planting with dual row disc opener planter showed that despite large variations in shoot counts at 8 weeks post planting, all plots harvested the same tonnes sugar/ha. Cultivation methods trialled varied from 2 passes of wavy disc cultivator to disc bed renovator followed by rotary hoe.

For further information on Project Catalyst, please contact Michael Waring at Terrain NRM on 0428771361.



Applying Variable Rate Nutrient Application within a block

SOUR GRASS MANAGEMENT IN THE HERBERT

Sour Grass (*Paspalum conjugatum*) is a creeping perennial grass that forms dense mats, but can grow to 60cm tall. This grass is thought to be a native of the tropical Americas, but is now found throughout tropical regions of the world. It is a problem on heavier soils in the wet tropics cane growing region from the Herbert to Mossman. It is also referred to as **Johnston River Grass, Yellow Grass or Hilo Grass** in various areas or in other countries. Sour Grass will compete vigorously with cane crops on heavy soils that tend to water log for some periods of the year and will actually "kill out" patches of cane, in particular Q208^Φ



Herbicide situation

There were no herbicides registered for control of sour grass, so HCPSL conducted a series of herbicide screening trials to develop a management strategy and herbicide control options for the fallow as well as in crop situations. Seek advice on best management options as herbicides are not always effective if used under conditions where the sour grass is badly stressed in extreme conditions.

Management Recommendations

Fallow

One or more herbicide applications may be necessary to kill the existing sour grass population in the old ratoons going into a fallow, as well as stem, stool regrowth and seed germination. The following options proved very effective:

- Roundup® Attack™ 570 4L/ha + Starane® Advanced 1L/ha or
- Roundup® Attack™ 570 4L/ha + 2,4-D Amicide® Advance 700, 0.8L/ha

In crop management

- Cultivate heavily infected areas in ratoon blocks (eg with ratoon discs) to allow cane to recover in dry conditions as herbicides may not be effective
- Apply herbicides when sour grass is not stressed and is actively growing
- Consider not planting Q208^Φ in blocks with a history of heavy sour grass infestation.
- Plant a variety with a better crop canopy and a heavier trash blanket to assist with sour grass management.

Herbicide options (directed application)

- DalaPon 740, 5-10kg/ha + Daconate® 3L/ha
- DalaPon 740, 10kg/ha
- Soccer® 700 WG, 2.2kg/ha + Balance® 750 WG, 200g/ha + Daconate® 3L/ha
- Krismat® WG, 2kg/ha + Daconate® 3L/ha

Roundup® Attack™ 570 and DalaPon 740 can be used in crop through Shielded or hooded sprayers.

NAVUA SEDGE MANAGEMENT IN THE HERBERT

Navua sedge (*Cyperus aromaticus*) is a clump forming perennial sedge that can be spread by seeds or from sections of the clump and attached rhizomes being transplanted. It can grow to 1 metre tall in cane crops. It was reported on roadsides in the Mulgrave district in the late 1980's and is now found from Mossman to the Herbert. It has become established in cane blocks in the wetter areas of districts and causes problems with stalling basecutters while mechanical harvesting. Seeds may remain viable for over 5 years.

A replicated field trial was established in ratoon cane during the 2011/12 wet season. A range of herbicides and tank mixtures were applied to established Navua sedge (approximately 15-100cm tall) in a third ratoon block of Q204^Φ. The cane crop was between 75-125 cm tall at the time of application. Li 700® @ 250ml per 100L of spray volume was added as the adjuvant. A number of herbicides with known sedge control potential were selected as well as products with wide spectrum grass and broadleaf control ability.

Sempra® @ 130g/ha and Hero® @ 250g/ha treatments as well as Hero® @ 250g/ha plus Actril® DS @ 1.5L/ha all gave a complete kill of small clumps of Navua sedge. However even though the ratings improved over time for the larger clumps of Navua sedge, later inspections revealed regrowth and a second application would have been required for satisfactory control.

All treatments that included Krismat® achieved excellent control of smaller clumps and seedlings less than 15-20 cm tall as well as acceptable control of even taller clumps. The addition of Daconate® improved the initial knockdown achieved as well as the overall performance of Krismat® @ 2Kg/ha plus Daconate® @ 3L/ha plus Actril DS @ 1.5L/ha as well as Velpar® K4™ @ 2L/ha plus Daconate® @ 3L/ha gave acceptable control of all size clumps of Navua sedge. Navua can be effectively controlled in fallow situations with a blanket application of herbicides. Management in crop can be achieved with a directed application of herbicides under the crop canopy in ratoon cane, as required.



HARVEST MANAGEMENT SYSTEM

Our district has shared in the success of our web based geographic system and real time GPS tracking. It sets us apart from other sugar growing regions. This system provides our district with enormous amounts of data opportunities. Importantly, previously unseen productivity trends are emerging as a result of mining this data and undertaking spatial analysis. This work will be presented to the industry in 2014.

The HRIC and its structures are vital to the Herbert's geographical systems which also include the Harvesting System. The Board of Directors of HCPSSL and HRIC manage these systems and make the critical decisions affecting growers who are now reliant on them operationally and for future opportunities.

The Harvest Management System was supported this year by improved visual checking – many thanks to Peter Luke. A few sets of eyes in the field around estimating towards the finish can improve the remains and finish predictions, easing the concern of larger harvesting groups and allowing for orderly mill finishes.

The estimate at 98% actual/original was one of our better ones. A close estimate always means a smoother season and many groups held their estimate from 4 weeks out right to the end. Many thanks to the groups doing long hours and some massive quotas like 300 bins – who would have thought it possible 10 years ago.

Accuracy of cane consignment and subsequent productivity data improved in 2013. Contractors and growers are to be congratulated and thanked for their commitment to this vital task. GPS tracking assists in trapping errors and therefore further improves accuracy of consignment. The spatial systems we rely on in the Herbert are now more critical than ever for harvest management, productivity and Precision Ag.

Harvesting Best Practice

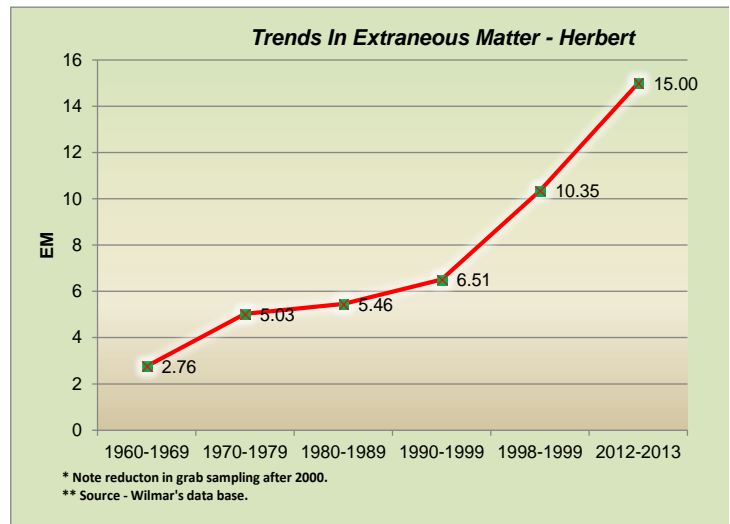
There will inevitably be discussions at forums in 2013 surrounding harvesting speeds and pour rates. Spatial analysis of pour rate data obtained from harvesters in the Herbert over two years and compared with subsequent productivity has been analysed to show the relationship between productivity and pour rates. Although many harvesting groups are doing an excellent job, the data shows that high pour rates / speeds have (on average) a negative impact on subsequent yields and that since poor root systems have characterised the district, the problem has worsened. In some cases due to high harvesting speeds & pour rates, up to 40% of yield in the following crop is lost. When this occurs for example in crop classes such as plant and first ratoons, the negative impact on the shared asset (our crop) is massive.

This is sensitive data. However the Herbert is recognised as a leader in innovation and is comfortable with spatial information. There is however, a challenge for the district to see this new information as an opportunity as opposed to a threat and to capitalise on it in innovative, constructive and mature ways.

Other discussions are likely to surround extraneous matter. Although cane loss is important, extraneous matter for the Herbert is now around 15% as confirmed from grab samples at Macknade. This EM as well as increased biomass has an exponential affect in lengthening the season (several weeks) in that it also substantially reduces the crushing rate. From a growing point of view growers are impacted by several weeks of increased season length, lower CCS and higher harvesting costs.

The following basic example shows the impact of “trash is cash” on the grower - EM Case Study

A grower sends in 100 tonnes of cane at 13 CCS. He would get paid - $100 \times \$400 \times .009 (13 - 4) + .6353 = \3304 . As well as 100 tonnes at 13 CCS = 1300 CCS Units, he also sends in an additional 8 tonnes of tops and trash @ 2 CCS = 16 CCS Units. The total delivery of 108 tonnes has an average CCS of $1316 / 108 = 12.19$ CCS. The grower would therefore get paid $108 \times \$400 \times .009 \times (12.19 - 4) + .6353 = \3253 . As well as losing \$51, he must pay an extra 8 tonnes x \$8 per tonne harvesting cost or **\$64** to harvest the tops and trash.

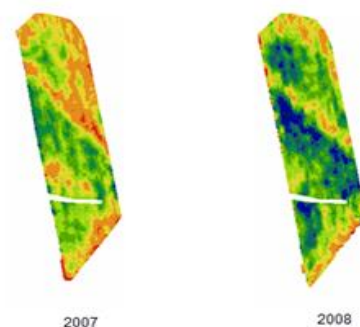


Yield Monitoring

HCPSSL's yield monitoring program continued throughout 2013 and will continue to add value to productivity. The data for these maps is sent wirelessly from the harvesters with yield monitors, stored on the HRIC server and generated into yield maps automatically. The Herbert has some of the most extensive and fast deliveries of yield mapping anywhere in the world. The yield maps are reliant on local Canegrowers, HCPSSL, and Wilmar's Board of Directors continued funding for the HRIC.

Experts in yield monitoring Dr Troy Jensen and Dr Rob Bramley will conclude a comprehensive study of yield monitoring technologies this year. This trial involved multiple yield sensors on Trevor Smith's harvester and many innovative trials on the Tabone farm. Many thanks to these collaborators for assisting with this important research

Automated Yield Mapping @ HRIC



PRECISION AGRICULTURE

Base Stations

GPS Auto steer has been rapidly adopted by many Herbert growers and has now reached critical mass. The GPS base stations performed well transmitting a strong clear correction signal. The bases utilise both GPS and Glonass satellite constellations. This signal is similar to that used by much of the mining, surveying, road construction and agricultural industry. Many areas are able to obtain signal from more than one base station with built in redundancy a feature of our system.

A continuous improvement program should see signal improved in 2014 with new high power digital radios planned for some of our Bases. A repeater in Lannercost will be moved to a more central location. Settings in the HCPSL bases change from time to time based on current best practice thinking and the need to accommodate multiple vendors. HCPSL is currently weighing up the benefits of a new GPS correction language. Currently CMR+ is used, however a new protocol called RTCM3 may offer significant benefits such as improved Precision Ag options, better signal, more satellites and vastly improving vertical accuracy. Improvement in vertical accuracy requires more satellites than for steering. The trend towards using GPS rather than laser for land surveying and levelling will continue due to cost benefit advantages. A technical article on the RTCM3 can be found at:

http://www.hayeshelp.com/gps/documents/topcon/rtcm3_v_cm+pdf

Frequency changes are likely again this year as two new frequencies purchased last year were not compatible with all rovers. Dealers and growers will be kept abreast of any impending changes.

Auto Steer Systems

Tips

- Many operators don't change channels due to convenience. For best practice use the nearest base station.
- The HCPSL web site (www.hcpsl.com) has a list of Base locations and frequencies.
- In theory, GPS accuracy degrades one millimetre each kilometre further from the base.
- If you require a repeater due to terrain blocking a signal then HCPSL has a couple we can loan out.
- Place the repeater high and where it can receive the base signal. Only a few growers required the repeater in 2013.

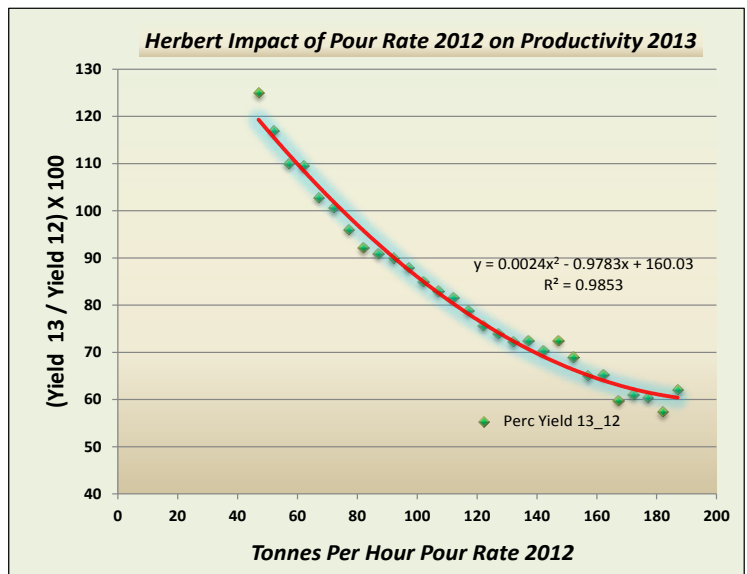
Considerations

- One of the first things you can do with your rover is use it to standardise your blocks for drill direction and row width. Choose geographically different parts of the farm and pick a **heading / bearing** and stick to it. Maybe choose parallel to a boundary. This may be part of a long term plan to join blocks together for longer drills and improved harvest efficiency.
- Record block headings in a book or on a memory stick and provide to contractors when they Rip, Harvest, Spray, Fertilise etc.
- Ripping and cultivating along the same heading should assist planting contractors to plant dead straight.

- If you are achieving optimal productivity with certain row widths - standardise these. It will assist contractors who come onto the farm for operations like spraying and multi row fertilising and harvesting
- Lengthen drills where possible. The reconfigured longer drills help with harvesting and farming efficiency.
- Harvesters with GPS can pick up more cane if the harvester driver knows the Heading and the row spacing is even.
- Once the farm is standardised, the next step is the zonal cultivation. The application of such things as Mill Mud and Ash which always get placed in exactly the same position eliminates waste of expensive products. (See Page 7 of this report)
- Using the GPS as a data logger to record underground cables, pipes, drains, rocks, holes, power poles and overhead lines can help with planning and safety and save time and money.
- GPS is ideally suited for setting up permanent preformed beds as a farming system. Consider this farming practice **if it suits your** area and gives you more options.
- Variable rate is an aspirational goal for many farmers with GPS. It involves such things as electromagnetic mapping and control gear.

Standard Drill Spacings in the Herbert

For efficiencies in growing, planting and contracting, please use 1.68m, 1.70m, 1.83m or 1.90m.



This year spatial analysis was run in the Herbert and other mills using data acquired from harvesters. It shows strong relationships between pour rate in one year and subsequent block productivity. The above data from 10,000 cane blocks shows what happens on average. In the graph it can be seen that at an elevator pour rate of 140 tonnes per hour, there will be 30% less cane in the following year than at 80 tonnes per hour pour rate. There is evidence that YCS has meant the cane is somewhat less resilient to mechanical harvesting than previous healthy cane crops.

The challenge for the district apart from more work in this area is to take leadership and deal with the many complex harvesting issues in a mature and constructive manner. The crop is a shared asset and various reports over the years have shown that its health, volume and quality of our crop are by far the most important factors in the industry's survival.

REEF WATER QUALITY GRANTS (RWQP) FORMALLY REEF RESCUE

Located in tropical north eastern Queensland, the Wet Tropics NRM region is an expansive area of some 2.2 million hectares. The area extends from Bloomfield in the north, south to Ingham and west to Mount Garnett and includes the Atherton Tablelands. Ten river catchments lie within this region.

In 2008 the Australian Government committed \$200 million to Reef Rescue, a component of the *Caring for our Country* initiative, which improves the quality of water flowing in to the Great Barrier Reef lagoon by encouraging land management practice change.

In April 2013, the Australian Government announced their commitment to a further \$200 million to fund the program for another five years under the new name, the 'Reef Water Quality Program' (RWQP).

Terrain and partners, on behalf of the Federal Government, are again offering grants to assist farmers who meet the criteria for the period 2013-2016.

Anyone interested in applying must contact their industry Grants Officer to register a project application. Applicants must then work with the industry Grants Officer to submit a completed application. The next round of applications will not be held until January 2015. For the Herbert region, the cane industry's Grants Officer is HCPSSL's Linda Di Maggio who can be contacted on 4776 5660.

As a carryover from the previous phase of Reef Rescue, the new rounds of funding will work off the Cane Priority Practice Investments table; some of the criteria has changed and there has been some new additions added to the table.

The Reef Water Quality Grants aim to reduce the discharge of **nutrients**, **sediment** and **pesticides** into the Great Barrier Reef lagoon by increasing the voluntary uptake of improved land management practices by landholders within the Great Barrier Reef catchments.



Reef Rescue Grants Officer, Linda Di Maggio assisting Malcolm Giorcelli with his Reef Rescue Application

THE HERBERT PRODUCTIVITY REVIEW

The review was initiated by the Herbert Cane Productivity Services Limited (HCPSSL) in order to identify the major reasons for highly variable productivity in recent years. Dr Alan Garside was employed to undertake the review.

The review encompassed the collation and analysis of productivity data held by HCPSSL, interpretation of the analyses, and interviews with growers. In general the outcomes clearly indicated that water management (seasonal conditions, drainage, water logging), various aspects of harvesting (groups too big, harvesting too fast, not enough adjustment for seasonal conditions/ geographic harvesting, cane loss) and season length (the harvest season being too long) were the main factors influencing productivity in the Herbert.

Suggestions are made as to how these issues may be addressed. Although it is acknowledged that varieties are an important part of any production system it is demonstrated that their influence on the large season to season variability in productivity is relatively minor.

The following recommendations are made:

Recommendation 1: The large amount of variety performance data on different soil types in different seasons held by HCPSSL warrants collation and analysis in order to objectively assess whether different varieties are suited to different soil types and regions.

Recommendation 2: The importance of seasonal conditions in November as they affect the subsequent crop needs to be fully appreciated and strategies adopted to minimise their impact.

Recommendation 3: The difference in climatic regimes between the Ingham Line area (and Upper Stone) and other areas needs to be recognised and if necessary different production strategies put in place.

Recommendation 4: The most suitable varieties for Ingham Line may well be different to those for other areas and this should be taken into account within the variety evaluation program

Recommendation 5: Emphasis should be placed on the development of mound planting for the wetter areas.

Recommendation 6: The analysis of harvesting losses in the current crop and harvesting practices on the productivity of the next crop needs to be continued and expanded. It is a critical area of investigation.

Recommendation 7: The harvest season should be adjusted to aim for the crushing to finish by the end of October with the current practice of setting a starting date to be replaced by setting a finishing date. This recommendation will obviously require an earlier starting date and probably staggered harvesting based on geographical and equity considerations but should not be dismissed out of hand.

To obtain a copy of the report go to www.hcpsl.com or contact Lawrence Di Bella (HCPSSL Manager).

GROWER PRODUCTIVITY FORUMS

Three forums were held during 2013 which were once again well attended. The first 2 forums were run in a different format to previously undertaken, while the 3rd forum was the traditional shed meeting format.

The first forum was the *Herbert Cane Industry Walk and Talk Day*. HCPSSL, BSES PEC and DAFF joined together to deliver the event on the 30th of April, 2013. The event was a huge success with about 150 growers, advisors and community attending throughout the day.

The following activities were undertaken on the day:

Field demonstrations -

- New varieties
- New tillage equipment
- New herbicide technology
- Herbicide management strategies

Presentations -

- Dr. Alan Garside - Findings from the Herbert Cane Productivity Review
- Dr. Andrew Ward - An introduction to the BSES PEC program
- Adam Royle - The results of the 2012 Controlled Release Fertiliser trials
- Ash Benson and Phil Ross - Duiron and its use

The 2012 industry awards were also presented on the day.

The second forum for the year was the *2013 AGRI ROADSHOW - Managing Rural Assets*. The 2013 AGRI ROADSHOW was held on Wednesday 8th of May, 2013 with 26 people attending the event. The following groups partnered to deliver the road show:



The following presentations were made:

- Ways to improve farm productivity and sustainability
- Manage your rural assets effectively and efficiently
- Plan for a secure future
- Perform a business health check
- Protect your income

The third forum was held the 2nd and 3rd of October, with approximately 130 attending. The topics covered were:

- The results from the Herbert Water Quality Project
- Management of Duiron and water quality related issues
- Management of problematic weeds like Sour, Hamil, Guinea and Para grasses
- Feral pig management in the Hinchinbrook Shire
- New varieties and the SRA planting breeding changes
- The results from the SRA funded Grower Group project - Improvement of Internal Soil Drainage and Yield on Heavy Clay Soils in the Herbert.

PHOTOS FROM THE WALK AND TALK DAY



HCPSL YEAR IN REVIEW

2013 for HCPSL was a year of business development to meet the Herbert cane industry needs.

HCPSL undertook the following activities during the 12 month period:

- Became the leading research, development and extension group for the Herbert cane region.
- Delivered an accurate crop estimate and a high quality harvest management system to the industry.
- Funded and establish the Regional Variety Trials (RVT's) to compliment the SRA Plant Breeding effort.
- Undertook the Herbert Productivity Review, led by Dr. Alan Garside.
- Further developed its GPS basestation network to service the industry.
- Continued the yield mapping of approximately 20,000 hectares annually.
- Conducted 3 grower forums, 1 field day and numerous other meetings throughout the year.
- Supplied Approved Seed cane from its Stone River Farm for the first time.
- Leased the Macknade Technical Field Department offices, sheds and farm to undertake local research activities and grow approved seed cane for purchase by growers.
- Undertook 847 seed inspections for growers.
- Sold 660.4 tonnes of cane to growers through its Approved Seed Plots. This is the largest amount of cane sold by HCPSL in its history.
- Treated 168 tonnes of cane through the hot water treatment tank facilities.
- Made investment into feral pig management.
- Represented the industry at various meetings and arenas.
- Undertook research on the following:
 - Undertook research as a part of the SRA led YCS project
 - Alternative herbicides to Duiron for the control of problematic weeds
 - Managed four SRA funded Grower Group projects
 - Undertook research as a part of the Herbert Demo Farm project
 - Managed one Woolworths/ Landcare funded project
 - Undertook research into Controlled Release Fertiliser and nitrogen loss pathways
 - Undertook research into biochar through a James Cook University led project.

The above list is only some of the activities that HCPSL has achieved on behalf and for the Herbert industry.

The HCPSL Board and staff would like to sincerely thank its members for their continued support in 2013 and look forward to providing a high quality service again in 2014.

THE HERBERT PLANT BREEDING REVIEW

On the 23rd of April, 2013 a review of the Herbert Plant Breeding activities was undertaken. The following organisations were represented at the review: SRA, HCPSL, Wilmar Sugar and Herbert River CANEGROWERS.

The growing and milling sectors of the Herbert industry raised the following concerns:

- The Herbert is in 'crisis' concerning varieties - this was the growers view point.
- Concerns that current varieties are failing in ratoons.
- The loss in ratooning is impacting on industry profitability.
- Concern that variety options are lacking on difficult soils and conditions.
- Impact on varieties caused by Yellow Canopy Syndrome.

Frikkie Botha (SRA) made a presentation on the current structure of the overall BSES plant breeding program and then specifically the Northern/Herbert program. There was considerable discussion if the program was adequate to meet the Herbert industry's needs.

It was decided that SRA will retain Progeny Assessment Trials (PATs) and Clonal Assessment Trials (CATs) at the SRA Meringa site. Selection efficiency means that the industry gets the greatest potential economic gain from four PAT/CAT combinations (Meringa, Burdekin, Central and Southern). The Herbert FAT program will remain at four FAT trials, augmented by two Regional Variety Trials (RVTs) established by HCPSL in conjunction with SRA.

From 2014, the FAT trials will be moved to different sites / environments each year, whilst the RVTs will target difficult and extreme environments (wet, dry, heavy clay soils, etc). This combination will mean that any future varieties released commercially will have been tested in a minimum of nine individual Herbert environments, compared with four in the past.

During the review there was also discussion that potential varieties from other regions were not being tested early enough in the Herbert region. This is not the case with 310 clones in the 2013 Herbert FATs being sourced from many sources and this will remain the case into the future.

Wilmar staff asked about the use of introgression material in the general breeding program. SRA considers introgression material as highly valuable in broadening the genetic base of Australian varieties. It is planned to continue use introgression material into the future in the SRA program.

In 2013 SRA had:

- 159 introgression parents from the Wilmar program, water – efficiency and biomass research programs
- 53 introgression crosses currently in Meringa PATs from both the SRA and Wilmar crosses
- 47 clones being tested for possible inclusion in the 2015 FATs.

SRA commenced a review of weightings given to different traits in the selection system in mid-2013. This review will most probably lead to changes to the SRA plant breeding selection system in the future.

The changes to the Herbert selection program should help drive the change desired by the Herbert industry and lead to productive varieties being released.