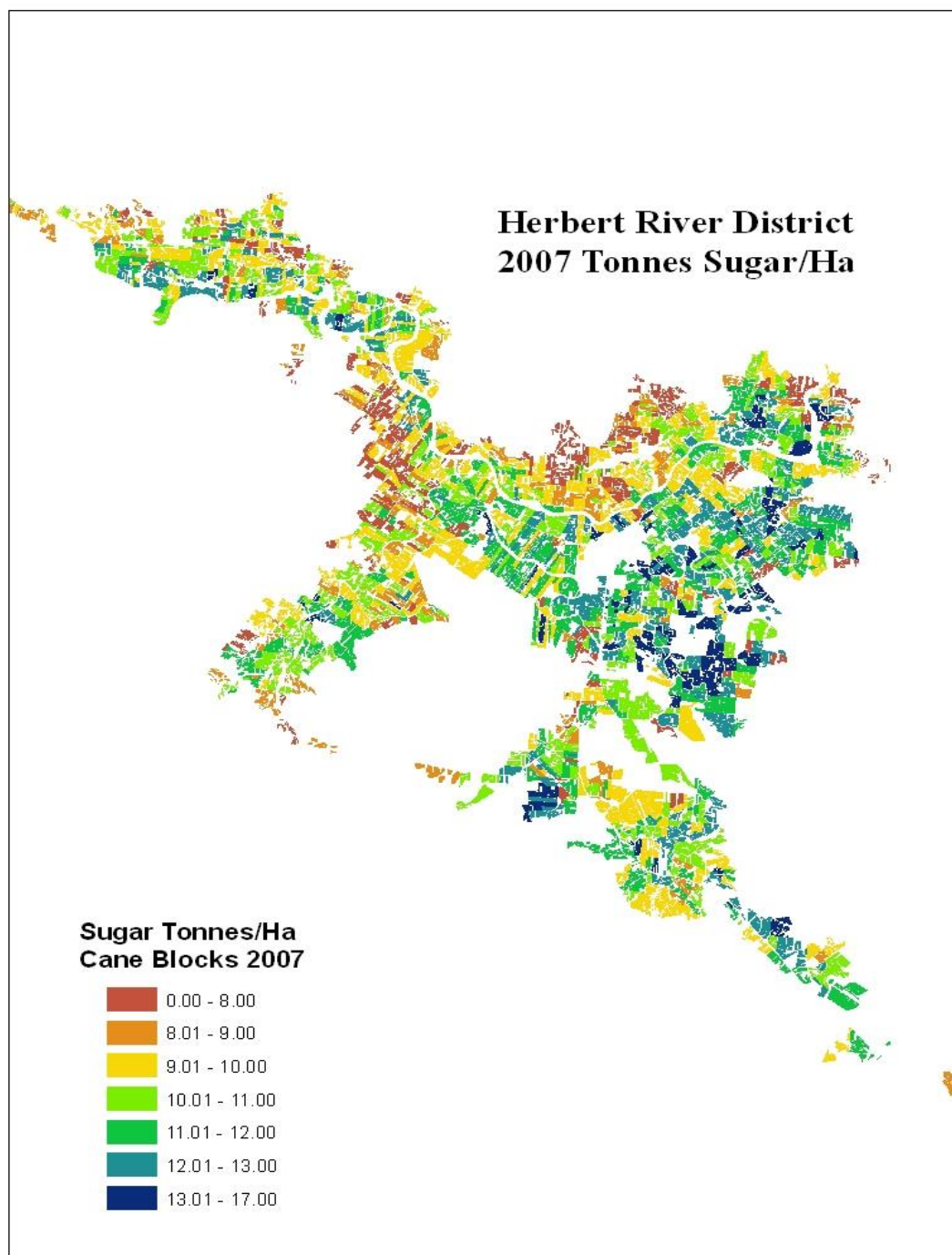


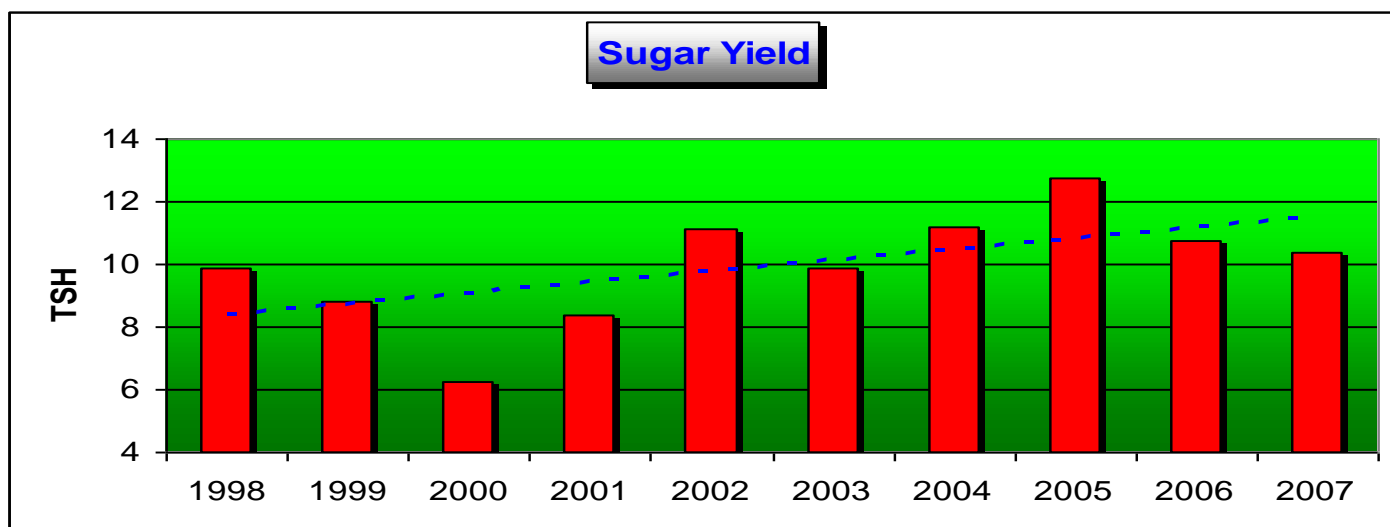


HERBERT PRODUCTIVITY REPORT 2007



This is the sixth Herbert Productivity Report produced as part of the Herbert Cane Productivity Initiative. The excellent level of cooperation from growers and harvesting crews in supplying the block and cane consignment data on which this report is based is greatly appreciated. This report provides details of the 2007 crop and the many projects and initiatives aimed at enhancing productivity and industry profitability. We hope that its contents will be of assistance to you in making decisions on what variety to plant, when to harvest different blocks, and what crop management practices and pest and disease control measures are appropriate for your farm. Much of the material in this report will be explained in more detail at Productivity Forums. We encourage you to attend the forums covering your part of the district and to keep up-to-date with the excellent work that is being conducted in this district.

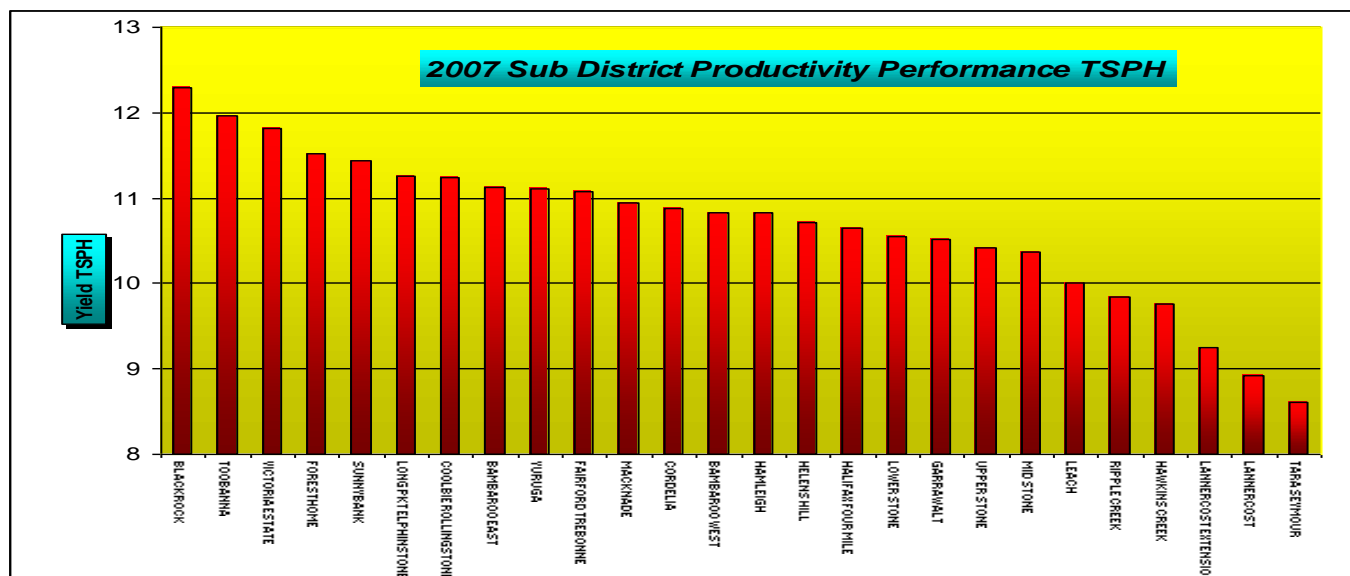
CROP PERFORMANCE 2007



In 2007, the Herbert produced a crop of 4,287,010 tonnes of cane from a harvested area of 57,158 hectares. The cane yield was 75 tonnes cane / hectare which is the same as the 10 year average. CCS was 13.8 which was half a unit higher than the 10 year average. Consequently sugar yields were above average at 10.35 tonnes sugar / hectare. Sugar yields varied across the district with the highest yields in the Blackrock, Toobanna, Victoria Estate, Foresthome and Sunnybank productivity zones. The lowest yields occurred in the wetter parts of the district such as Lannercost Extension, Lannercost and Tara/Seymour.

Rainfall in 2007 was above average across the whole district with February being the wettest month. Prolonged waterlogging, particularly in the lower-lying parts of the district and reduced levels of sunshine over the entire district during January to April restricted crop growth. Above average June rainfall caused the start of the harvesting season to be delayed by about 3 weeks.

Year	Tonnes	Ha Harvested	CCS	Yield Cane	Yield Sugar
1998	4,191,272.31	48,669.90	11.46	86.1	9.87
1999	4,151,741.51	59,955.95	12.73	69.3	8.81
2000	2,802,049.39	58,379.16	13.01	48.0	6.24
2001	3,311,004.97	56,876.94	14.34	58.2	8.35
2002	4,243,591.27	54,892.20	14.4	77.3	11.13
2003	4,051,558.05	56,975.69	13.9	71.1	9.89
2004	4,641,372.86	56,410.75	13.56	82.3	11.16
2005	5,553,359.05	57,078.93	13.11	97.3	12.76
2006	4,900,084.45	57,657.45	12.62	85.0	10.72
2007	4,287,010.00	57,159.40	13.81	75.0	10.35



CANE PRODUCTIVITY INITIATIVE

PRODUCTIVITY FORUMS

Four rounds of productivity forums were held during the year. More than 150 growers attended the first round of forums held in late February which covered the following topics:

- Update on the smut situation
- Recent changes to the Harvest Management System
- Results of MODDUS trials and plans for 2007
- Report by Ron Kerkwyk and Lawrence Di Bella on their visit to TechAgro operations in Brazil and Cuba.

The second round, held in early April, focussed on varieties and covered:

- Which varieties to choose for planting and their smut ratings
- New Variety Guide for the Herbert
- Developing a variety propagation plan
- Accessing seed cane for the new smut resistant varieties Q208[®] and KQ228[®].

The third round was held during the last week of May and included:

- Herbert regional smut management plan for 2007
- Release of Herbert district and subdistrict productivity reports
- New technologies for harvester tracking, cane consignment and yield monitors
- Cost effective fertiliser programs
- Agronomy and economics of new farming systems
- CSR improvement plans for cane bins and locos.



Productivity Forum Field Trip

The final round was held in August and provided growers with:

- A further update on the smut situation
- Details of new projects funded under the government RCP program
- Best practices for cane grub management

RESEARCH AND DEVELOPMENT TEAMS

The **Harvesting** team met twice and conducted the following activities:

- Harvest Best Practice workshop in April with over 50 people attending
- Survey of harvesting equipment
- Harvesting newsletter with details of the TechAgro visit, the Harvest Management System, survey of harvester optimisation, and haulout courses.
- Trials to evaluate yield monitoring and automatic base-cutter systems on harvesters
- Plans for the installation of new technology on harvesters.



Automatic Base-Cutter Trials

The **Soil Health and Crop Establishment** team met twice. Activities included:

- Fact sheets on different legume crops for the Herbert and appropriate inoculants
- Analysis of profitability of different fallow management strategies
- Lime guidelines for sustainable sugarcane and fallow crops in the Herbert
- Updates on Yield Decline trials at Morris's and Raiter's
- Legume workshop in September focussing on legume agronomy, cost reductions achievable with legume fallow crops, fertiliser programs for farming systems with legumes and lime requirements for growing legumes.

The **Variety Adoption** team met five times. Activities included:

- Development of a smut management action plan for the Herbert
- Rapid propagation trial using Smart Sett plants
- Preparation of Smut-Smart Variety Guide for Herbert
- Distribution and importation of Q208[®] and KQ228[®] planting material
- Strip trials with smut resistant and intermediate varieties
- Recommended changes to list of approved varieties for planting in Herbert.

VARIETY PERFORMANCE & RECOMMENDATIONS

Since its discovery in December 2006, smut has continued to spread throughout the district, with all subdistricts now showing smut whips. With the 2008 planting season approaching, growers should again be considering what varieties they have available to plant.

Not surprisingly, the area existing under Q200[Ⓢ] has increased in 2007, from 2% to 5%, and it will increase again in 2008, due to its level of smut resistance, and its proven ability to perform in some areas of the district. Growers should take care not to plant more than 30% of any variety on their farms.

To try to alleviate the total dependence on Q200[Ⓢ] as a smut resistant variety, and the fact that Q200[Ⓢ] will not perform everywhere, KQ228[Ⓢ] and Q208[Ⓢ] were introduced into the Herbert district on a large scale in 2006 and 2007. As data is still being gathered on how these varieties will perform in the Herbert district over a full crop cycle, it is recommended that growers try planting small amounts on their farms to get an idea of performance in their blocks. Intermediate varieties are also an alternative.

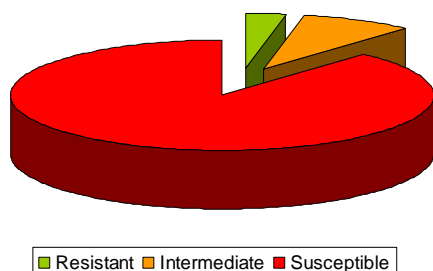
Even though the area under Q157 and Q158 decreased in 2007, the area under Q174[Ⓢ] increased slightly. These three varieties will decrease over time due to their susceptibility to smut. Whilst it is anticipated that Q208[Ⓢ] may ease the issue associated with the removal of Q158 from the poorer quality soils, there is still some concerns by growers that once Q174[Ⓢ] is removed, no early season varieties will exist. This issue may be addressed by KQ228[Ⓢ] and the possible release of KQ91-31405 in 2008.

In December 2007, the local sugar industry submitted an application to the DPI regarding a change in the Approved and Recommended Planting Lists. In the application, varieties with a smut rating of 6.5 – 9 would no longer exist on the Approved Planting List, while varieties rated between 6 and 6.5 would be removed from the Recommended Planting List, but remain on the Approved Planting List. The DPI has acknowledged receipt of this letter and are currently investigating implementation of these changes.

The local sugar industry has also decided to adopt these recommendations on a local level, and the variety guide will be modified accordingly. The Recommended and Approved Planting Lists are as follows –

Recommended	Cassius, Q200 [Ⓢ] , KQ228 [Ⓢ] , Q199 [Ⓢ] , KQ91-31405, Q208 [Ⓢ] , Q172 [Ⓢ] , Q219 [Ⓢ] , Q96, Q231 [Ⓢ] , Q119, Q135, Q233 [Ⓢ] , Q190 [Ⓢ]
Approved	All the above varieties plus Q215 [Ⓢ] , Q120, Q183 [Ⓢ] , Q220 [Ⓢ]

Percentage of Smut Resistant and Intermediate Varieties in the Herbert



BSSES Variety Trials

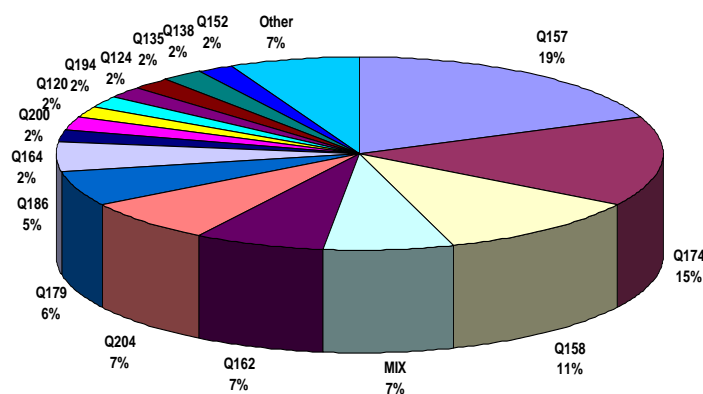
To stay in tune with new farming systems in the Herbert, BSSES Plant Improvement Program has planted one final assessment variety trial and a variety strip trial using 1.8m row spacing in 2007. Whilst improved farming systems are still evolving, it is proposed that future Plant Improvement trials will continue to incorporate new practices starting with at least one more 1.8m single row final assessment trial in 2008.

The Herbert will also benefit from an increase in the number of variety trials as of 2008. A fourth final assessment trial will be planted this year not only to boost the overall new variety effort but also to maximize the results by establishing each of the four trials on different soil groups.

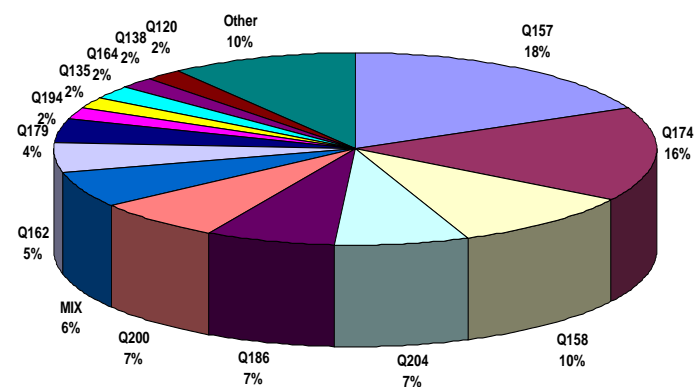
The four sites will be as follows;

- Dry Climatic Zone – Sandy-Loam (Ingham Line)
- Dry Climatic Zone – Clay/Clay-Loam (Stone River)
- Wet Climatic Zone – Clay (Lower Herbert/Hamleigh)
- Wet Climatic Zone – Loam (Abergowrie)

Varietal Composition of the Area Under Cane in 2006



Varietal Composition of the Area Under Cane in 2007



VARIETY PERFORMANCE & RECOMMENDATIONS

NEW VARIETIES

KQ228^Φ (Smut rating – 1.5)

Originating from the Burdekin CSR variety program, KQ228^Φ was distributed to Herbert growers in 2007 via local BSES and HCPSL release plots (128 tonnes) and seed cane transported from the Burdekin (185 tonnes). Current recommendations suggest KQ228^Φ is best suited to fertile soils with good moisture holding capacity. KQ228^Φ produces good early CCS and is therefore recommended for early – mid harvesting. Whilst KQ228^Φ is resistant to Leaf Scald, Red Rot and Brown Rust it has shown low tolerance to some herbicides. Further updates and information will be available to growers in the new variety guide due out by May 2008.

Q199^Φ (Smut rating – 3)

Released originally in Mossman, Q199^Φ will be available to Herbert growers from the 2009 HCPSL approved seed plots. Q199^Φ is currently in BSES variety trials and has limited local data. However information suggests it will be most suitable on fertile soils with reasonable moisture. While northern trials have shown variable results for yield and ratoonability, Q199^Φ generally has good CCS. Q199^Φ is also resistant to Orange Rust and Pachymetra root rot.

Q208^Φ (Smut rating – 4)

Like KQ228^Φ, Q208^Φ was released in Ayr before being distributed to Herbert growers in 2007 through BSES release plots (43 tonnes) and shipments from the Burdekin (176 tonnes). A solid performer in almost all other regions, Q208^Φ is showing a wide range of adaptability. Whilst Herbert growers should still show some caution, Q208^Φ is producing good results for CCS with moderate yields across a range of soil types and environments suggesting potential for it to be widely adopted by the Herbert industry.

Q219^Φ (Smut rating – 4)

Grown on sandy soils in the north, Q219^Φ was introduced into the Herbert by BSES in 2006. Subsequently it was distributed to HCPSL and will be available to Herbert growers via the 2008 approved seed plots. Several growers were also selected to assist with assessing its performance on low fertility soils and adverse environments. Trials indicate that Q219^Φ generally produces lower than average CCS with moderate yields, however it is more tolerant to adverse conditions than most other varieties. Q219^Φ is resistant to Pachymetra root rot, Leaf Scald and Orange Rust. It can produce prolific side shooting that to date has not affected germination. It is recommended that growers read the new Herbert variety guide and seek advice from the BSES or HCPSL before planting larger blocks with this variety.

Disease Rating		Description
1 - 3	Resistant	Varieties with this rating will generally show "NO" adverse effects in yield from disease.
4 - 5	Intermediate	Varieties with this rating are capable of resisting most of the adverse effects from a disease. However, as disease pressure increases so does the risk of yield losses.
6 - 7	Intermediate – Susceptible	Varieties with this rating are "LESS" capable of resisting the adverse effects from a disease. As disease pressure increases so do potential yield losses.
7 - 9	Susceptible	Varieties with this rating will generally show "HIGH" levels of adverse effects on yield from the disease, possibly leading to total yield loss.

Q231^Φ (Smut rating – 5)

Originally from the Tablelands, Q231^Φ was planted into a BSES propagation plot and in 2007 a handful of growers received several hundred stalks in an effort to assist BSES variety trials and find a suitable recommendation for Q231^Φ in the Herbert. Current information suggests that Q231^Φ is best suited to fertile clay soils where it produces moderate yields and good CCS, especially earlier in the season. Resistant to Orange Rust, Leaf Scald and Pachymetra Q231^Φ should be available to Herbert growers in 2010 from the HCPSL approved seed plots.

Q233^Φ (Smut rating – 5.5)

Introduced from the BSES Central District plant improvement program, Q233^Φ produced promising results in local trials particularly on loamy soils. Due to limited material, Q233^Φ was only distributed to the HCPSL in 2007 and will be available to growers in 2008 via approved seed plots. Good yields and CCS on suitable soils along with resistance to Leaf Scald, Pachymetra root rot and Orange Rust make Q233^Φ a viable option where growers have low smut infestations.

PROMISING VARIETIES FOR THE FUTURE

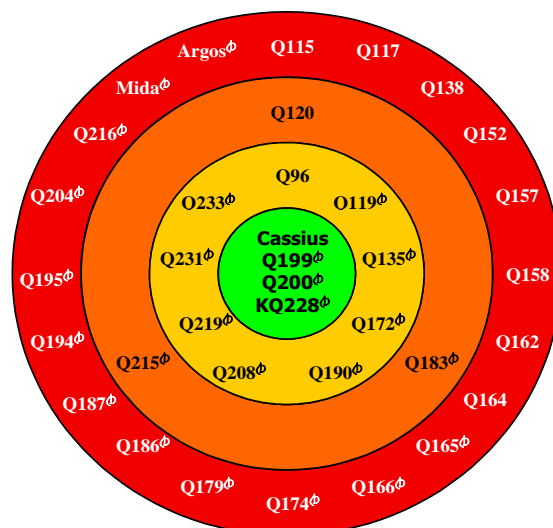
KQ91-31405 (PBR pending) (Smut rating – 3)

Introduced from the Burdekin CSR variety program, KQ91-31405 will be distributed to Herbert growers in 2008 via a limited release plot. BSES Limited have also initiated a rapid multiplication of KQ91-31405 using tissue culture techniques which will assist in producing approximately 400 tonnes of seed cane in 2009 when combined with HCPSL approved seed plots. KQ91-31405 has moderate yields with exceptionally high early CCS and is currently displaying a wide adaptability to most soil types and environments.

MQ93-538 (PBR pending) (Smut rating – 1)

A product of the CSR variety program at Macknade, MQ93-538 is a high yielding, low CCS variety suitable for lower fertility soils. MQ93-538 is currently being assessed for millability and is still progressing through the final stages of assessment. Further information on the possible release of MQ93-538 will be made available to growers once it has passed its final assessments.

Targeting Your Varieties to Combat Smut



PESTS AND DISEASES

PESTS – ANIMALS AND INSECTS

Losses due to animal and insect pests were generally low in 2007, with the exception of feral pigs. The table below details those losses.

Pests	Tonnes Lost	Hectares
Wireworms	6000	580
Cockatoos	4097	405
Greyback Grubs	8720	332
Rats	13071	2360
Frenchi Grubs	480	14
Wallabies	615	131

There appeared to be two distinct beetle flights; a substantial flight in December 2007, and a smaller flight in January 2008.

The damage from cane rats was average due to good in-crop weed control. There is a direct correlation between weed content and rat damage.

Damage levels from feral pigs continue to rise, and is a concern. Cane losses and cane value are given below.

Year	Tonnes Lost	Value (\$)
2001	11,870	474,800
2002	13,152	526,080
2003	11,000	440,000
2004	9,800	392,000
2005	9,400	376,000
2006	20,300	812,000
2007	30,165	1,206,600
Total	105,687	\$4,227,480



Severe feral pig damage in a field of Q200

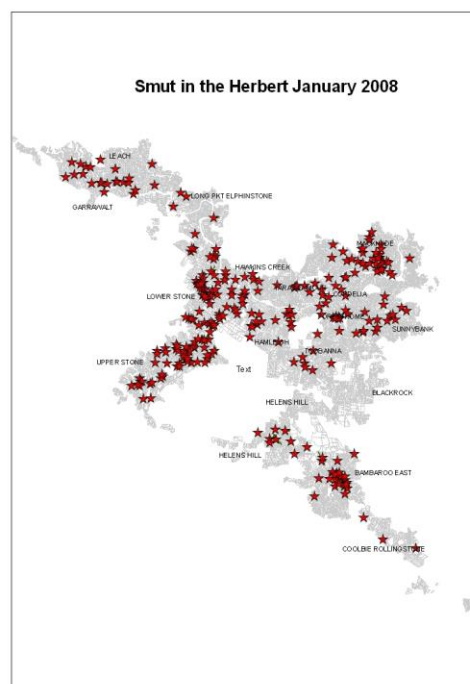
DISEASES

Over the last few years, levels of ratoon stunting disease (RSD) have declined. Good farm hygiene is one reason for this decline. Another reason is the uptake of clean planting material for new varieties to replace smut susceptible clones.

Chlorotic Streak (CSD) - This disease is spread by water. Improved surface drainage across 30,000 hectares in the Herbert, has no doubt assisted significantly in reducing the incidence of CSD. Varieties like Q135 are highly susceptible to this disease.

Sugar Cane Smut continues to increase, with new infections confirmed on a daily basis. At time of writing, 433 blocks with smut were confirmed on 192 farms. The table below highlights the major varieties involved. The smut map indicates the location of infected farms. Recently smut was found in Innisfail.

Variety	Smut Rating	No of Blocks
Q174	9	139
Q158	8	137
Q157	8	48
Q204	9	18
Q186	8	13
Q162	8	8
Q194	9	8
Other		51



Each star represents a block

All varieties rated 6.0 and above, were removed from the BSES recommended list, effective for planting in 2008.



A typical smut whip in young ratoons

FARMING SYSTEMS

CONTROLLED TRAFFIC TRIAL RESULTS – 2007 UPDATE

The trial established at the Herbert BSES Station (Fairford Rd, Ingham) was again harvested in 2007 (1st ratoon crop). The trial was established in 2004 on a 3.6ha fallow block with a silty clay soil. The aim of the trial is to evaluate the agronomy and economics of different farming systems in the Herbert region. The trial consisted of three treatments and two replications. The treatments assessed were:

- Conventional system @ 1.6m single row, furrow opener planting
- Pre-formed mounds @ 1.6m single row, double disc opener planter
- Pre-formed mounds @ 1.8m dual row, double disc opener planter

All treatments were planted with the variety Q174[®]. The single and dual row treatments at the trial site in September 2007 are shown below.

First ratoon single row @ 1.6m

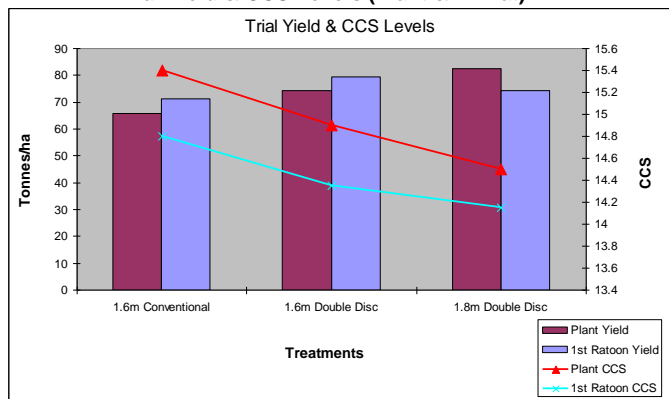


First ratoon dual row @ 1.8m



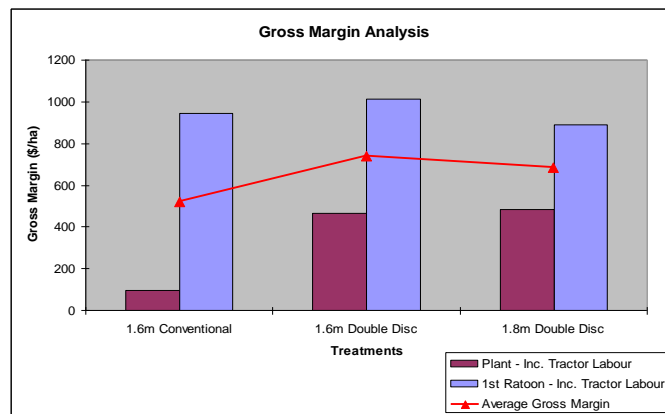
During the trial period information on productivity and the economics of all three treatments were collected. The graph below displays the productivity results for plant and 1st ratoon. The plant and 1st ratoon crops were harvested in August 2006 and July 2007 respectively. Yield and CCS data were collected from each treatment using mill data. The yield across each of the treatments has been similar over plant and 1st ratoon crops, however a trend of lower CCS in dual row configuration is a factor that warrants further monitoring over the remaining crop cycle to see if this continues.

Trial Yield & CCS Levels (Plant & 1st Rat)



An economic comparison of each treatment in plant and 1st ratoon is shown below. The cost of tractor labour hours at \$20/hr is also taken into consideration in the gross margin analysis. A summary of the average gross margin to date for each treatment is shown below. Overall the 1.6m single row DDOP treatment produced the highest average gross margin of \$739/ha. This is \$219/ha higher than the conventional treatment (\$520/ha). The 1.8m dual row DDOP treatment had the second highest average gross margin at \$686/ha, resulting in a \$166/ha increase over the conventional treatment.

Gross Margin Analysis



Average Gross Margin for Plant and 1st Ratoon

Conventional System	New System 1.6m	New System 1.8m
\$520/ha	\$739/ha	\$686/ha

The Herbert BSES farming system trial is still in the early stages of analysis with only plant and 1st ratoon data collected to date. The new farming system treatments have displayed positive economic benefits over the conventional treatment during the current trial period. The 1.6m single row disc opener planted cane provided the highest and most consistent gross margin, with an improvement over the conventional treatment of \$219/ha. The 1.8m dual row disc opener planted cane had a \$166/ha improvement over the conventional system treatment, however the reduced CCS levels in plant and 1st ratoon has impacted on the overall benefit realised from the dual row system. Caution should be taken when interpreting the productivity results from this trial because of the limited replication. The trial has provided some valuable information on the new farming system and has highlighted some potential issues which warrant further investigation in future years.

FARMING SYSTEMS DEVELOPMENT ISSUES

- Suitable varieties for the varying row configurations are still being tested
- Legumes for each region and farming system are being assessed.
- Herbicides for broadleaf management in fallow legume crops as well as herbicides for specific legumes need to be evaluated
- Land preparation requirements for varying farming systems and soil types are still being determined
- Bed formation pre and post planting for various soil types and moisture levels and potential lodging issues with shallow planting depths is being considered

HARVEST MANAGEMENT AND COMMUNICATION PROJECTS

HARVEST MANAGEMENT AND DATA TRANSFER SYSTEMS CONCERNING THE HERBERT HARVESTING SECTOR FOR 2008 AND BEYOND

HCPSL has taken a leading role in establishing systems to transfer data and add value to the value chain in the region. The data will be used for multiple uses throughout the industry by various industry stakeholders.

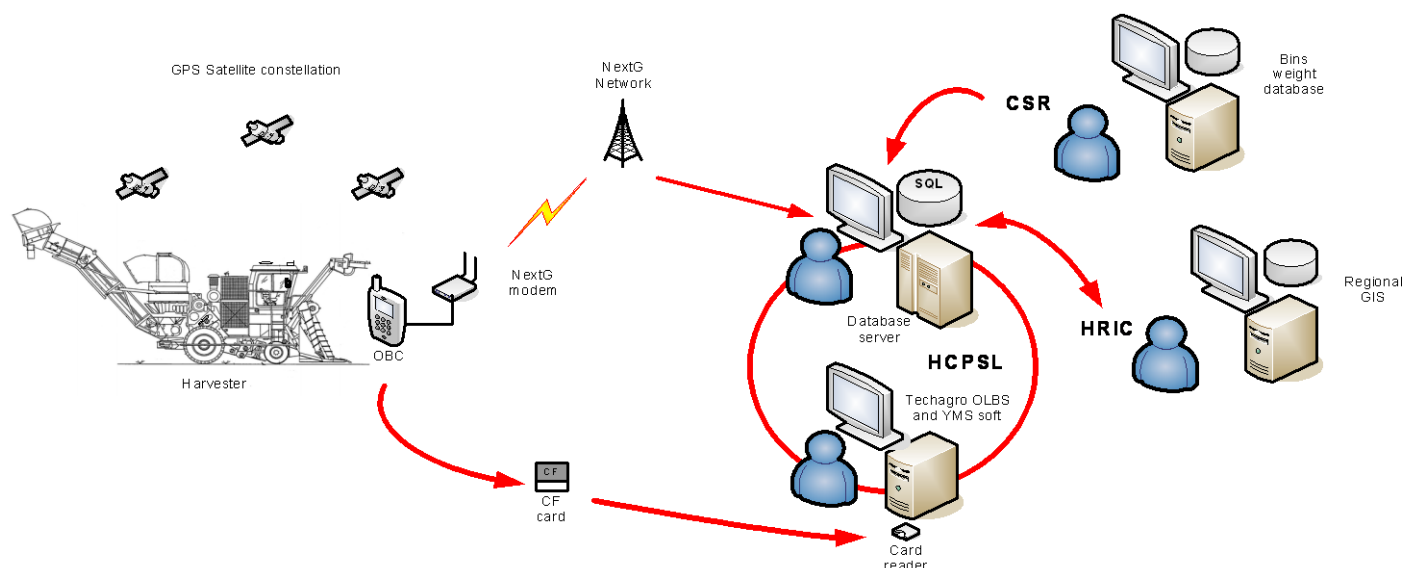
In 2008 all harvesters will be fitted with an Onboard Computer and Next G modem to enable communications between the harvester, the Mill and HCPSL. This technology will allow harvesters to be tracked live or in real time.

The Techagro Onboard Computer was selected because it has the potential for multiple uses which include:

- Harvest management
- Next G communications
- Yield monitoring system (optional)
- Automatic basecutter system (optional)
- Harvester performance reporting system (optional)
- Adjusting forward speed to achieve constant cane flow through the harvester

Over time the old AgGuide datalogger system and data cards will be phased out and replaced by the real time communication system that will be implemented.

The diagram below highlights the system that will be implemented in the Herbert region from 2008 onwards. It is hoped that one day we will have better harvesting and transport systems as a result of this major HCPSL initiative.



SEASON LENGTH OPTIMISATION

NITROGEN RATE TRIAL FOR EARLY HARVESTED CANE

In 2007, the Bambaroo trial was harvested again to investigate reduced nitrogen rates for early harvested cane. The results of the trial indicate that the lower nitrogen rate gave the greatest monetary return over the duration of the trial. Other trials conducted in 2005 returned the same results. The table below shows the results of the Minato early harvested nitrogen rate trial over the 3 year period.

Nitrogen rate (kgN/ha)	CCS 1 st ratoon	CCS 2 nd ratoon	CCS 3 rd Ratoon	TCPH 1 st ratoon	TCPH 2 nd ratoon	TCPH 3 rd ratoon	\$/ha minus N fertiliser cost 1 st ratoon	\$/ha minus N fertiliser cost 2 nd ratoon	\$/ha minus N fertiliser cost 3 rd ratoon	Average \$/ha
100	14.00	12.25	14.8	78	90	62	1260	1954	1109	1441
150	13.95	12.4	14.1	79	86	71	1227	1841	1118	1395

Variety: Q157

Assumptions used for 1st ratoon
 Sugar price- \$270/ton
 Harvesting and levies- \$6.80
 Nitrogen value- \$1.24/kg of nutrient
 Date harvested- 23/6/05

Assumptions used for 2nd ratoon:
 Sugar price- \$400/ton
 Harvesting and levies- \$7.00
 Nitrogen value- \$1.24/kg of nutrient
 Date harvested- 29/6/06

Assumptions used for 3rd ratoon:
 Sugar price- \$285/ton
 Harvesting and levies- \$6.80
 Nitrogen value- \$1.24/kg of nutrient
 Date harvested- 24/7/07

SEASON LENGTH OPTIMISATION

THE 2007 HERBERT MODDUS® PROGRAM

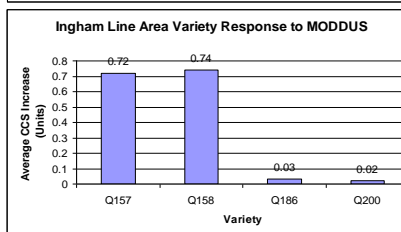
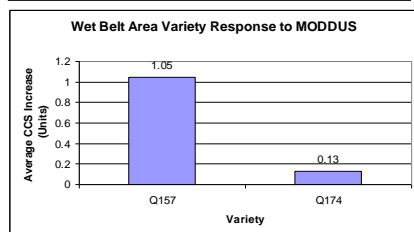
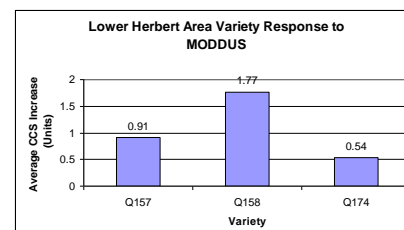
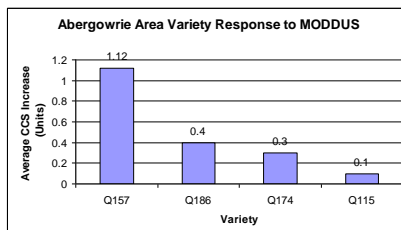
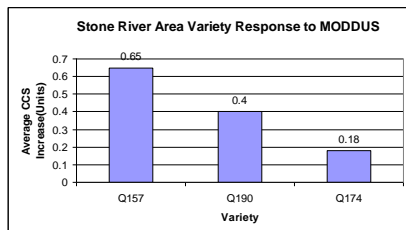
BSES and Syngenta conducted the Herbert MODDUS® program again in 2007. Q157 and Q158 showed the greatest average responses of 0.7 and 1.4 CCS units respectively. Higher CCS varieties Q174^b, Q186^b and Q200^b were less responsive.

The district average results showed an average increase in CCS of 0.56 in 2007 for early harvested cane. This was lower than the 0.7 increase experienced in 2006. The reason for the lower response could be possibly being attributed to the high CCS experienced early in the year and relative maturity of the crop.

Average CCS Increase	Average Yield TCH	Average TSH Increase
0.56	84	0.47

Comparing MODDUS against unsprayed areas for the 2007 Benchmark Trials

The average increase in CCS level is shown in the graphs below from the Benchmark Trials conducted in 2007 in the Herbert region.



To date there has been no statistically significant differences for cane yield for early harvested cane which was harvested within the prescribed time period. It is anticipated that the program will occur again in 2008.

WHAT IMPACT DOES TIME OF HARVEST HAVE ON SUGARCANE CROPS IN THE HERBERT RIVER DISTRICT?

As a part of the SRDC funded project BSS264, four trials were planted in areas within the Herbert River district where climatic and soil conditions might allow early harvest of cane. These areas could be harvested earlier in most years due to drier field conditions and higher CCS levels. Plant and first-ratoon crops were harvested at all sites and a second ratoon was harvested at the Crystal Creek site. The Crystal Creek, Helens Hill and Wharps sites were harvested at three different harvest times: early (June-July), mid (mid August-September) and late (mid November-December). Crops at the Blackrock site were harvested at early and mid season. Ratoon crops were harvested as close as possible to 12 months after the previous harvest. Trials contained commercial and advanced experimental varieties.

The trials indicated that the optimum time to harvest plant cane in the Herbert was mid season – this gave the highest CCS, cane yield and sugar yield. The trial results clearly indicate that harvest times have a significant effect on cane yield for ratooning cane late in the season. The average loss for all ratoon crops comparing the mid season harvest schedule and the late harvest schedule was 17 t/ha of cane, while a yield loss of 28 t/ha of cane occurred at the Crystal Creek site. The optimum time to harvest cane in the Herbert is mid season. Mid season is where the highest CCS, cane yield (TSPH) and sugar yield (TSPH) is achieved. However, it is not possible to harvest the entire crop at the optimum time due to mill crushing capacities and volume of cane to harvest during a particular season.

Should there be a need to alter or extend the harvesting period, an earlier start to the crushing appears to be a better proposition than a later finish, for the higher yields of earlier ratooned cane would outweigh the disadvantages of lower sugar content due to an earlier start of crushing. The results clearly support this. Harvesting of cane through mid November and December also limits opportunities to improve surface drainage and establish legume crops during the fallow period.

The effect of time of harvest on Q200^b



Left: Cane harvested early the previous year

Middle: Cane harvested mid season the previous year

Right: Cane harvested late the previous year

Samples taken at June the following year

Average cane yield (t/ha) for all time-of-harvest trials

Crop class	Early harvest	Mid harvest	Late harvest
Plant cane	109.8	119.3	106.3
1st ratoon	95.0	83.9	68.3
2nd ratoon	75.0	73.0	45.0
Average	99.3	98.4	81.3
Av-1R & 2R	85.0	78.5	56.7

Average CCS levels for all time-of-harvest trials

Crop class	Early harvest	Mid harvest	Late harvest
Plant cane	12.02	13.96	13.71
1st ratoon	13.76	15.71	16.01
2nd ratoon	14.15	18.07	16.9
Average	13.03	15.19	15.15
Av-1R & 2R	13.96	16.89	16.46

Average sugar yield (t/ha) for all time-of-harvest trials

Crop class	Early harvest	Mid harvest	Late harvest
Plant cane	13.0	16.4	14.5
1st ratoon	13.1	13.2	11.0
2nd ratoon	10.7	13.2	7.7
Average	12.8	14.6	12.0
Av-1R & 2R	11.9	13.2	9.3

YIELD MONITORING AND PRECISION AGRICULTURE

GPS BASE STATIONS

HCPSSL operates a network of GPS base stations. When the community base station idea was conceived there were no agricultural community base station programs in operation throughout Australia. The purpose of the project was to:

- Decrease the capital costs associated with setting up a base station network
- Reduce the number of base stations required throughout the region.
- Increase the adoption of GPS and precision agriculture throughout the region.

A great deal of work by HCPSSL staff involved in this project was required managing establishment issues, radio signal coverage and industry perceptions. Opportunities to improve signal coverage are still being investigated and relocation of base stations and repeaters may be required in the future.

The concept of sharing a base station network pioneered in the Herbert has changed the game forever and has the potential to save farmers around Australia millions of dollars. Currently AgGuide and Trimble are using the open standard CMR+ correction signal sent out by our bases. The leading edge but potentially contentious multi base frequency was removed in 2007 and signal coverage improvements were observed as a consequence.

AUTO STEERING

During 2007, 22 tractors were fitted with auto steering kits to undertake cultivation, land preparation and planting operations throughout the district. These units have been purchased by growers or contractors. The companies which have supplied units in the Herbert are: AgGuide, Trimble, GPS-AG and BeeLine John Deere. The majority of the units are utilising the GPS base station network established by HCPSSL, while a few operators established their own base stations.

The first harvester fitted with auto steer was fitted and purchased by the Tabone family. The AgGuide system has been successful in steering the harvester in cane blocks previously planted under guidance. Note – The decision to buy a guidance system needs careful thought. There are many things to consider in the decision making process.



GPS unit fitted to a planting tractor

AUTOMATIC BASE-CUTTER HEIGHT SYSTEMS

During the 2007 harvesting season the automatic base-cutter control system was made commercially available in Australia by TechAgro Pacific. Several harvesters were fitted with the system and evaluations were made in the Herbert and Tully districts.

A total of 12 harvesters, including Austoft, Cameco and new John Deere machines, were fitted with the system during the 2007 harvesting season. There were six at Tully, five at the Herbert and one in the Burdekin.

Shown below is shows the on board computer that controls the automatic height of the base-cutter system.



On board computer of the automatic base-cutter system

Trials were conducted under several field conditions, which included light sandy soils to heavier alluvial soils; fields with dual and single rows; plant and ratoon crops; and different row profiles.



Evaluation of manual (left) versus automatic (right) base-cutter system in the Lannercost area

YIELD MONITORING AND PRECISION AGRICULTURE

AUTOMATIC BASE-CUTTER HEIGHT SYSTEM (CONT'D)

Evaluations included field measurements of stool damage, stubble height and estimated losses. Replicated blocks of 10 m and two adjacent rows were randomly selected across the fields for stool damage assessment according to BSES methodology. Trash was removed and stubble height measured in mm. A total of 20 cane stalks were randomly selected and hand cut from each treatment and weighed; stalk length was also recorded. This allowed an estimate to be made of the weight of 1 cm of cane and thus the weight of cane left behind after harvesting. Each treatment (manual and automatic) was consigned in different rakes, to allow the collection of consignment quality data at the mill, such as fibre content, CCS, juice purity and soil content. Results of the field trials are summarised below.

Comparison of the effect on six attributes of sugarcane of harvesting with automatic and manual modes for control of base-cutter height. Data are the means of 12 harvesters in three districts.

Attribute	Automatic	Manual
Damage (%)	64.5	70.3
Stubble height (mm)	11.3	33.8
Cane losses (t/ha)	1.2	2.9
Fibre (%)	15.6	15.7
Juice purity (%)	89.1	89.2
CCS	13.6	13.5

Difficulties were experienced in controlling the basecutter height in rocky conditions. Under these conditions the operator usually wishes to lift the base-cutter out of soil and rocks, hence the system does not operate effectively because it is required to skim the soil surface to determine a pressure reading. Further research and development is planned for 2008 to address some specific issues experienced in the Australian industry. The trial results indicate the system **offers significant opportunities** to the industry through the reduction in stool damage, cane loss, reduction in harvester operator fatigue and improvements in cane quality and dirt intake.

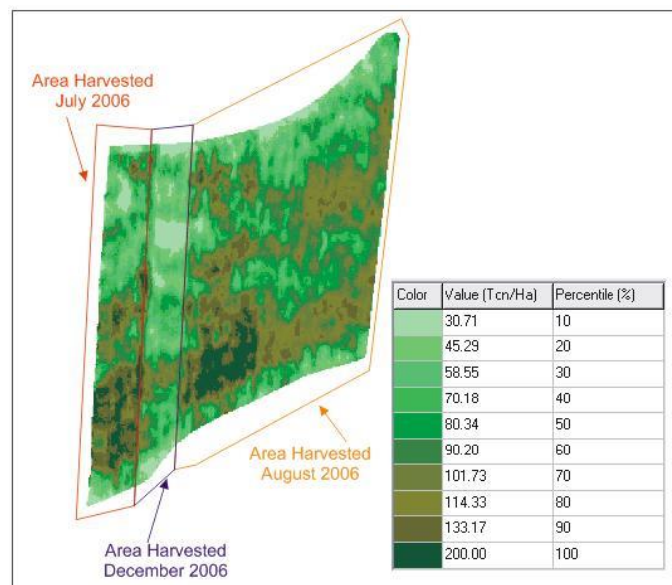
YIELD MONITORS ON HARVESTERS

Late in 2006, HCPSL were successful in obtaining a government grant to test and develop yield monitoring systems. In 2007, 30 AgGuide and 5 Techagro units were fitted to harvesters. Data gathered has produced yield maps allowing the industry to move towards precision agriculture and site specific block management. Precision agriculture has the potential to contain or reduce input costs and will lead to the application of best management practices within cane blocks.

In 2007, yield maps were generated from Herbert cane harvesters fitted with the Techagro and AgGuide systems. Discussions with growers who managed the farms with yield maps, could identify why specific trends occurred within cane blocks.

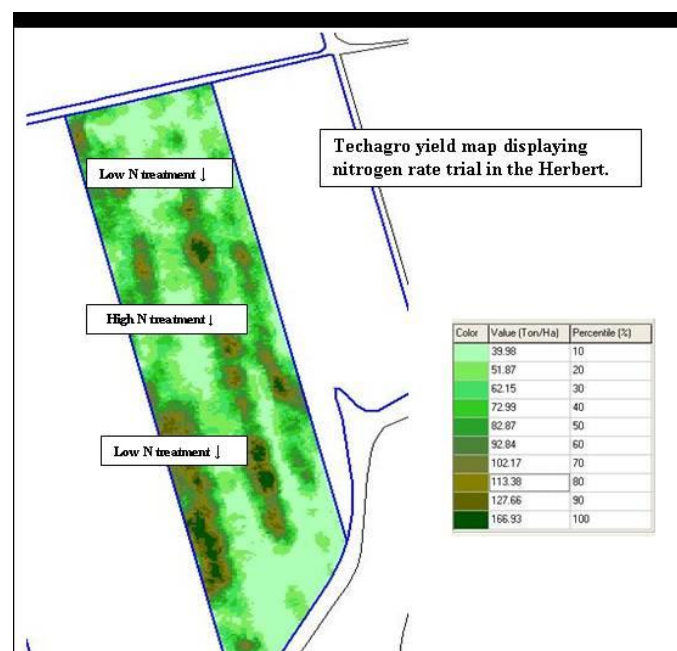
Examples:

In the map above there is a noticeable zone of lower yielding cane in the block with the same variety. After some discussion the grower indicated that the lower yielding area was harvested late the previous year and did not grow to its full potential, due to adverse environmental conditions and waterlogging experienced during the growing period.



Field with lower yielding area due to time of harvest

The map below highlights the differences in cane yield for a nitrogen rate strip trial. Each nitrogen rate treatment can be clearly identified by the Techagro yield map.



Techagro yield map for a Herbert nitrogen rate strip trial

Yield monitoring data should not be used in isolation but should be used with complementary information such as soil and plant tissue analysis data, soil and topography maps, aerial photos and remote sensing data where possible when developing site specific crop management. In other industries (like cotton and wheat) yield monitoring and use of other data has allowed these industries to move towards variable rate herbicide, fertiliser, lime and gypsum applications. In the Burdekin variable rate technology is already in use to apply gypsum. This technology is new to the sugar industry and offers significant opportunities to reduce overall inputs.

Considerations

Many growers are very interested in yield maps, however what the Herbert hasn't got is the ability to distribute and display these data via the internet yet. This is now an important issue for the district to deal with.

REGIONAL INITIATIVES

THE VALUE OF SOIL SAMPLING

For the past few years, HCPSL has had a subsidised soil sample analysis arrangement with Incitec Pivot. Cost of analysis is approximately half price. This is possible because growers take their own samples and HCPSL staff conduct the interpretation of the soil test results and provide the grower with the nutrient recommendations.

The benefits of this service are now more valuable to growers than ever before, due to significant increases in fertiliser costs, particularly Urea and DAP. A significant number of soil analyses are coming back, where no phosphorus (P) is required for a full crop cycle or longer.

Real dollar savings can result from this knowledge by using mixtures, where appropriate, without P. The cost to have a soil sample analysed is \$80.00 (including GST) and a tax invoice is provided as part of the service. Soil augers and sample bags are available from the HCPSL office. Samples must be paid for prior to despatch to the laboratory.

2007 AWARDS NIGHT

The 2007 productivity awards night was held at the Shire Hall on 31st March. This was the third year of this event. The guest speaker was Eric Schmidt from the NCEA (National Centre for Engineering in Agriculture), who gave a compelling presentation on Precision Agriculture to a captivated audience. A number of significant achievements were recognised including such things as Harvesting Efficiency, R&D, On-farm Co-operators and Farmer of the Year. All seven perpetual trophies are on display in the BSES foyer. This year's event will be less formal, less serious but hopefully a fun night, and will continue to celebrate and acknowledge such things as productivity, environmental stewardship, R&D and best practice. This year's event will be held on 7th May. It is hoped the growing and harvesting community will support the event in the spirit of both fun and achievement and also be a part of it by nominating people for certain awards.

ENHANCING EFFICIENCY AND INTEGRATION FROM FIELD TO FACTORY IN THE HERBERT

This SRDC funded project commenced in the Herbert in July 2006 with the following objectives:

- Investigate and develop tools for industry to manage the harvesting and transport interface to improve efficiencies and maximise monetary returns.
- Investigate opportunity to maximise returns from the harvested crop through improvements in scheduling a harvest within a farm, within a harvesting group and within a region.

Ten pilot harvesting groups are participating in the program to investigate alternative harvest schedules maximising the returns for individuals within the harvesting groups, under prevailing weather, soil and variety constraints.

The SugarMax model has been developed to determine optimum harvest schedules. It can be used to schedule farms within a harvesting group, varieties within a farm, varieties within a sub-district, soil types within sub-districts, crop classes within farms and districts within the region, to optimise net dollar return.

Once training is completed individuals and/or groups will have the ability to organise the harvest schedules best suited to the seasonal conditions as well as modify schedules after major events like rainfall to optimize the returns from the proportion of the crop remaining. This training and scheduling will be trialled with the groups in the project this season.

NEW PLANTER TECHNOLOGY

Two new planters were developed in the Herbert throughout 2007, in an effort to fine tune cost effective and efficient plant establishment. Each planter operates under minimum tillage principles, with wide throat billet delivery an option, and can be adapted to plant from 1.52m to 1.9m row spacings, therefore allowing for controlled traffic to be implemented where requested.

One planter was developed by PAD farming and is partly funded through an SRDC Grower Group Innovation Project (GGIP), while the other was developed by Paul Mizzi and is funded partly through Landcare funding. Both BSES and HCPSL staff are assisting in the analysis and effectiveness of each planter, across a range of soil types and situations. The development of such planting technology is critical to the future development of the Herbert sugar industry.

HRIC

The Herbert Resource Information Centre is a highly successful strategic partnership between CSR Sugar (Herbert River Mills); CANEGROWERS (Herbert River District); Herbert Cane Productivity Services Ltd; BSES Ltd; Hinchinbrook Shire Council; and Terrain NRM. The role of the HRIC is to source, collate, analyse and share spatial information. It aims to improve the access to spatial information for the sugar industry and its other joint venture partners, and help them with their capacity to use that information in GIS. HRIC also aims to identify opportunities for its partners to work together.

There needs to be a centralisation of the sugar industry GIS to avoid the disadvantage of data streams and duplication of services. The HRIC is currently working on a plan to implement an 'Enterprise GIS' solution to the sugar industry to allow for a more integrated, holistic, and scaleable approach to the GIS. An Enterprise GIS will promote greater Accessibility, Reliability, Security, Accuracy, Scalability and Cost Efficiency to the sugar industry GIS as it provides a common infrastructure on which to deploy and build GIS applications. It delivers business value across organisations and partnerships. This enterprise and web-based system will ensure that data (such as cane block, productivity, harvest monitoring, and yield monitoring information) is delivered to the people and organisations who need it, in a format and timeframe they require.