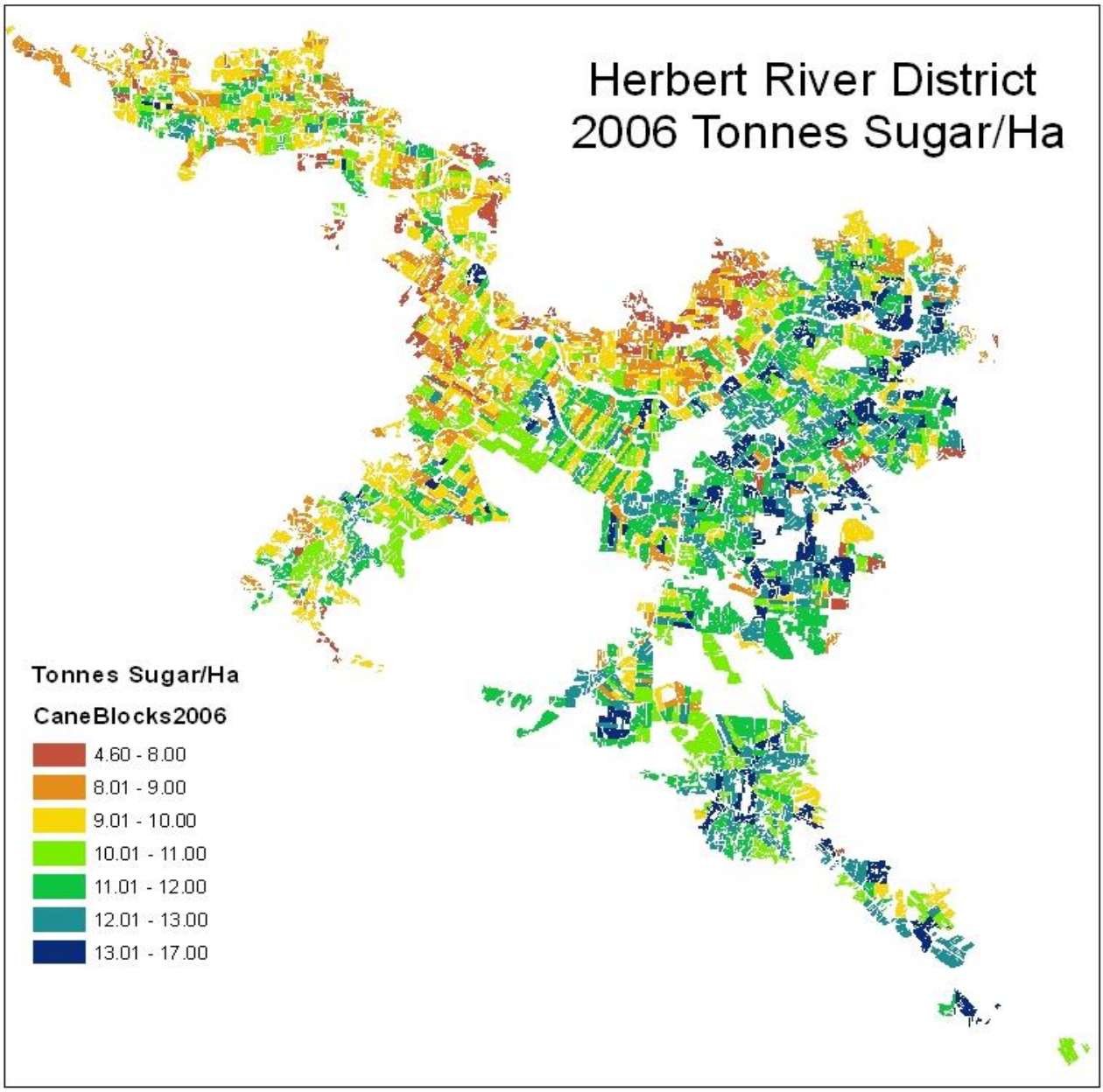
HERBERT PRODUCTIVITY REPORT 2006



This is the fifth Herbert Productivity Report produced under the Cane Productivity Initiative, which is a cooperative venture involving Herbert Cane Productivity Services Ltd., BSES Limited, CANEGROWERS Herbert River and CSR Sugar (Herbert) Pty. Ltd.. 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 2006 crop and the many projects and initiatives aimed at enhancing productivity. It is hoped that its contents will provide you with information that will assist you with farm decisions on variety selection and crop management.

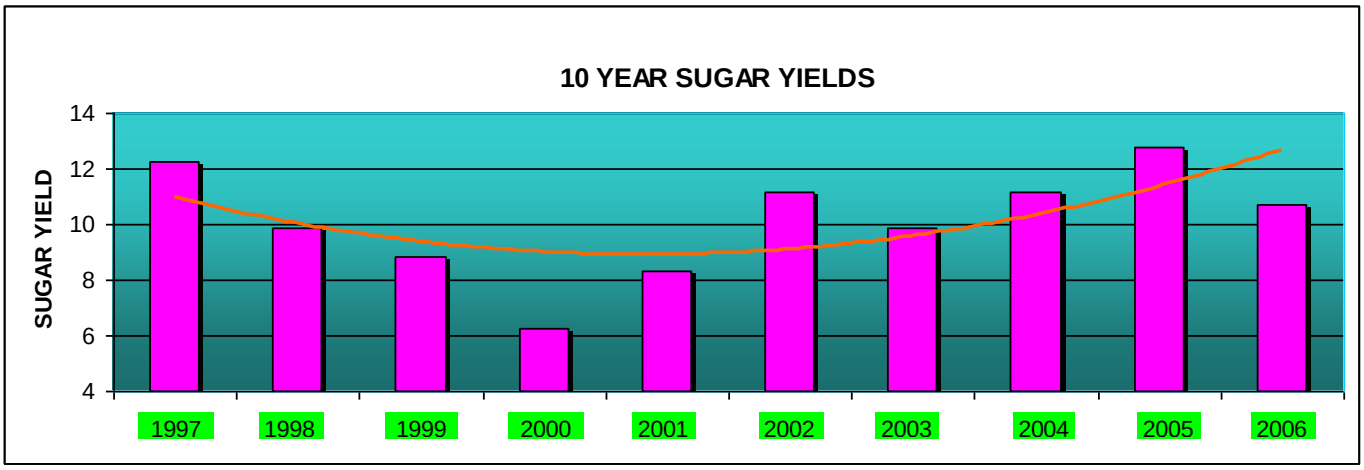
Herbert Cane Productivity Services Ltd.

Sugarcane for the future

SUGAR

CANEGROWERS Herbert River

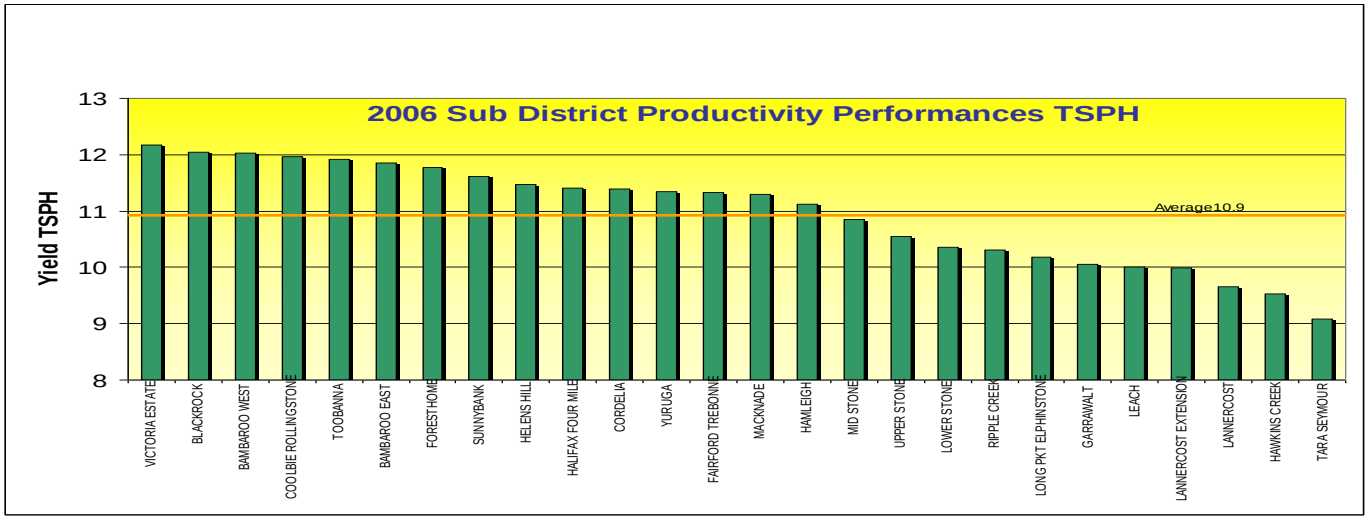
CROP PERFORMANCE 2006



In 2006, the Herbert produced a crop of 4,900,084 tonnes of cane from a harvested area of 57,657 hectares. The cane yield was 85 tonnes cane / hectare, well above the 10 year average of 76.6 tonnes cane / hectare. CCS was disappointing at 12.62, below the 10 year average of 13.25. Sugar yields were above average at 10.72 tonnes sugar / hectare. Sugar yields varied considerably across the district with the highest yields occurring in the eastern and southern parts from Halifax south to Coolbie. The lowest yields occurred in the northern parts of the district from Abergowrie to Lannercost, Hawkins Creek and Seymour.

Rainfall in 2006 was well above average, with 1800 – 2200 mm in the high yielding areas and 2200 – 3300 mm in the low yielding areas. Excessive rainfall from April to June delayed the start of the harvesting season by almost 3 weeks and resulted in wet harvesting conditions for much of the early part of the season. Falls of up to 800 mm in September again disrupted farming and harvesting operations, resulting in a very late finish to the season.

Year	Tonnes	Ha Harvested	CCS	Yield Cane	Yield Sugar
1997	5,272,421	57,328	13.37	92.0	12.29
1998	4,191,272	48,669	11.46	86.1	9.87
1999	4,151,741	59,955	12.73	69.3	8.81
2000	2,802,049	58,379	13.01	48.0	6.24
2001	3,311,004	56,876	14.34	58.2	8.35
2002	4,243,591	54,892	14.4	77.3	11.13
2003	4,051,558	56,975	13.9	71.1	9.89
2004	4,641,372	56,410	13.56	82.3	11.16
2005	5,553,359	57,078	13.11	97.3	12.76
2006	4,900,084	57,657	12.62	85.0	10.72



REGIONAL ISSUES

HARVEST MANAGEMENT SYSTEM

The harvesting of the 2006 crop proved to be a difficult time for all concerned. The usual problems were encountered, as well as lingering wet field conditions. The 2006 harvest saw the use of GPS data loggers in the Herbert. This was the first whole of systems approach for harvesting in the Qld Sugar industry. The use of this technology reduced the consignment errors significantly, providing us with far more useable productivity information, vital for varietal selection over different soil types.

GPS harvester tracking and data transfer from cards worked effectively in most cases. Some of the cards were not returned in a timely fashion, particularly towards the end of the season. This created significant difficulties and this will be addressed in 2007.

Associated with this project was the installation of a community network of 2 cm accurate GPS base stations. Ultimately this signal will be also be used by cane harvesters. An increasing number of contractors are utilising the GPS radio signal for auto guiding tractors and planters. We all had to work together to overcome the initial difficulties and lack of knowledge. Over time, using this technology will become the normal thing to do.

All this constituted a major learning curve for HCPSL staff and the users of the technology. The Herbert sugar industry now leads the way towards information rich agriculture using GIS and GPS technology. So 2007 will bring further advances in new technology, with the fitting of yield monitors to the majority of harvesters, over a two year period. The harvest management team would like to thank all contractors, growers and millers for their level of assistance and co-operation.

YIELD MONITORING AND PRECISION AGRICULTURE

Late in 2006, HCPSL were successful in obtaining a grant from RCP3 to test and develop yield monitoring. It is planned to fit yield monitoring/mapping devices to all harvesters by the 2008 crush. Data gathered will be used to produce yield maps and lead towards precision application technology. This method of precision agriculture has significant environmental benefits for our industry and will lead to best management practices.

These monitors will also value add to a harvesting contractor's business. Yield maps will illustrate variation in crop biomass within a field. The monitors will also help with producing accurate consignment. This technology is widely used in the Brazilian sugar industry, in Australian broad acre agriculture and wine industry, to minimise input costs of production.

SMUT SITUATION

Following the discovery of sugar cane smut in Bundaberg, the entire sugar industry responded by conducting inspections of susceptible varieties. These regional inspections were tailored to best suit local conditions, but with a common goal – to determine whether or not smut was present.

As we now know, the disease is confirmed in the Mackay and Herbert sugar districts. Immediately upon this confirmation, the Smut Response Plan was activated in the following way.

- Detailed inspections of fields of Q158, Q157, Q204 and Q174 ratoons.
- Quarantine of farms where smut was found.
- Spray out of infected stools.
- Ploughout of fields with severe, greater than 10% of stool infection.
- Voluntary re-establishment of the old quarantine area from Cardwell range in the north to Rollingstone in the south.
- Identification of the smut type or species.

It is now known that all the smut in Australia in sugar cane is the same strain as found in Indonesia. It is assumed that the disease probably arrived here on the wind. There is no relationship between machinery movement and location of local smut infections. There is no importance placed on method of arrival as we have to manage the smut situation irrespective.

A common factor in many Herbert infections is the proximity of infected stools to headlands, either in the outside few rows, or ends of rows. Level of infection is generally light, Q158 the main variety found infected, and mostly old ratoons are involved. Management of the disease includes the introduction of resistant varieties, including smut resistance in the variety selection program on farm.

The introduction of spore traps will help determine spore loadings across the district, essential knowledge for the process of varietal selection for planting. Research is planned to determine rate of spread of the infection within and between blocks.

In all other countries where sugar cane smut has been present, resistant varieties have been the answer. The Ord sugar district in northern W.A. has overcome the smut problem there in the same way, and here in the Herbert the same will occur over the next few years.

NEW HARVESTING TECHNOLOGY FROM CUBA

Engineers and technical staff from the Cuban company Tech-Agro made two visits to the Herbert during 2006. They visited briefly in March and gave a presentation to the industry on their harvesting automation and precision agriculture technology. They returned in September and fitted some of their products to Robert Lyons' harvester including an automatic base cutter height sensor, an onboard computer and electronic log book, sensors to measure base cutter pressure, chopper pressure, primary extractor speed and the flow rate of harvested material passing through the harvester. Using these sensors they were able to produce maps showing variation in cane yield across paddocks. Growers and technologists were able to inspect the operation of these products at a field day held on Robert Lyon's farm in late September.

VARIETY PERFORMANCE & RECOMMENDATIONS

VARIETY PERFORMANCE AND RECOMMENDATIONS

Over the past few years there has been a significant change in the varietal composition of the area harvested (Figures 1 and 2).

Since the confirmation of sugar cane smut in the Herbert district, growers need to consider planting smut resistant varieties as a mater of urgency.

The impact that smut may have in the Herbert is not yet fully understood, however overseas experiences with the disease indicates that the only way to overcome the disease is through the planting of resistant varieties. Currently, 7.1 % of the varieties planted are smut resistant and a further 5.9 % of varieties are intermediate to the disease.

Growers should consider not planting varieties highly susceptible to smut like Q157, Q158, Q174$^{\phi}$ and Q204$^{\phi}$ (to date most infections have been found in these varieties). The lesser the level of resistance the higher the spore loading is likely to become, resulting in potential economic losses due to crop yield reduction and ratoon loss. Growers should consider planting a proportion of smut resistant varieties in an attempt to manage the disease.

Q200$^{\phi}$ consisted of 2% of cane supplied in 2006 and is expected to increase in 2007, due to its smut resistance. The variety has performed well on a range of soil types throughout the district. However there are some limitations on very heavy clay soils and soils prone to drought stress. Q200$^{\phi}$ consistently sits above the mill average for CCS throughout the season (Figure 3). It appears that the variety requires adequate calcium, magnesium and zinc levels to ensure the full yield potential of the variety is realised.

Q135 represented 2% of cane supplied in 2006 and is intermediate to smut. The variety continues to perform on well drained fertile soils throughout the district, with good CCS between late August and late November. Due to the prolonged wet weather experienced during the year the variety did not perform as well due to infection with chlorotic streak disease.

In 1998, BSES began to screen its varieties for smut resistance and modified its plant breeding program to select varieties with resistance to sugarcane smut. Up until this stage it was difficult to justify screening of Australian varieties for the disease, as smut was not present in the country.

The table opposite highlights variety resistance levels to smut and should be considered when selecting varieties to plant this year. The following issues should also be considered when selecting which variety to plant:

- Soil suitability
- Time of harvest
- Environmental factors like drought and waterlogging
- Nutrient management
- Time of planting
- Pest problems like pigs and cane grubs
- Other diseases like Pachymetra root rot, orange rust, ratoon stunting disease and chlorotic streak disease.

It is essential that all these issues are considered and that the best variety is planted to each field. If you require further assistance with selecting the correct variety for your field, please contact the local BSES or HCPSL staff.

Figure 1

Varietal Composition of the Area Under Cane in 2005

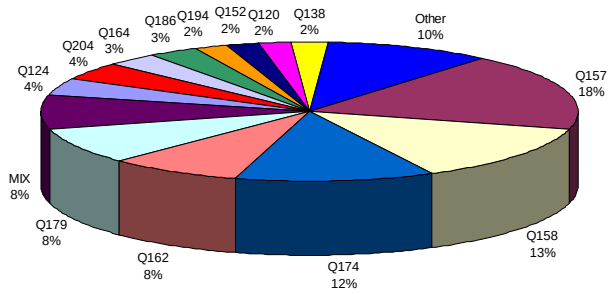


Figure 2

Varietal Composition of the Area Under Cane in 2006

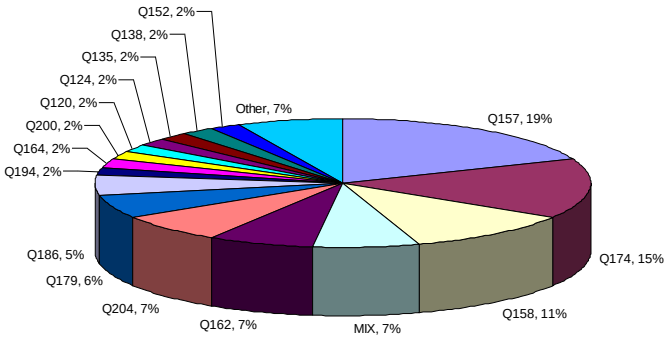
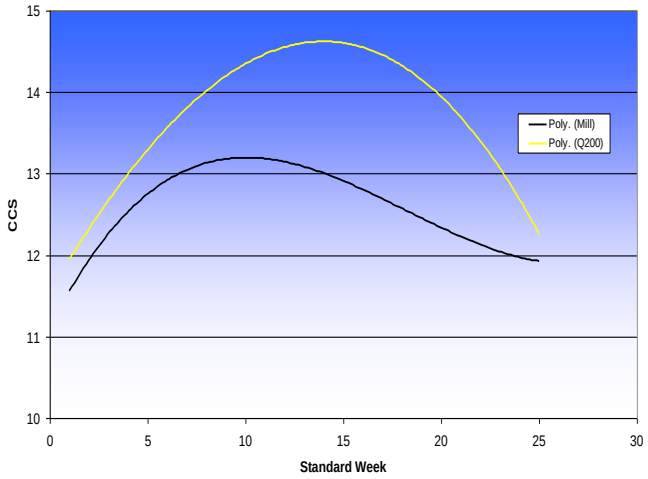


Figure 3
CCS for Q200 compared to mill average in 2006



VARIETY PERFORMANCE & RECOMMENDATIONS

NEW VARIETIES FOR THE HERBERT

Q183$^{\phi}$ released in 2006

Q183$^{\phi}$ was released in the Herbert in 2006. It has an intermediate smut rating of 6 and has favourable resistance ratings to the other main diseases. It is an erect variety with green stalks and pale green leaves, and the leaf sheath has prominent hairs and tight clinging trash. It was introduced into the Herbert from the Burdekin program in the late 1990's and has performed well in local variety trials. Trial results suggest that it is best suited to high fertility clay soils with good moisture holding capacity. It is a fast germinator and ratooner and as such will perform well in situations where rapid emergence is required when planting or ratooning has been delayed due to excessive moisture. It is reasonably tolerant of waterlogged conditions but not of drought. It is resistant to Pachymetra root rot, Fiji disease, orange and brown rust and has intermediate ratings to floc, leaf scald, yellow spot and RSD.

Characteristics

Germination:	Rapid & Reliable
Ratooning:	Rapid & Reliable
Yield:	Average – Good
CCS:	Good
Harvesting:	*Early*: Average- Good
	Mid: Good
	Late: Good
Water Logging:	Average – Good
Drought Tolerance:	Poor

Q208$^{\phi}$ and KQ228$^{\phi}$ for release to growers in 2007

Two varieties with good resistance to smut will be released to growers in 2007.
Q208$^{\phi}$, with a smut rating of 4, was released in the Burdekin several years ago and is performing well. It has shown a promising performance in trials in both the Herbert and Central regions and will be made available to growers in 2007. Whilst it is not clear which soils and environments Q208$^{\phi}$ is best suited, growers will be encouraged to trial this variety on their farms.

KQ228$^{\phi}$, with a smut rating of 1.8, was recently released in the Burdekin and commercial scale strip trials conducted in parallel with final stage trials suggest about a 10 per cent sugar yield increase (in the absence of smut) over existing alternative varieties. It has performed very well as plant cane in final stage trials in the Herbert and will be made available to growers in 2007 to trial on their farms. This variety, which holds the record for the shortest period between crossing and release (only 8 years), is the result of collaboration between CSR who bred this variety, and the BSES – CSIRO Joint Venture for Variety Improvement.

Q219$^{\phi}$ and QC84-621 for propagation in 2007

A further two varieties with intermediate smut ratings of 4 and 5.5 respectively will be planted to propagation plots this year as only limited amounts of seed are currently available. They will be made available to growers in 2008.

SMUT RATINGS FOR VARIETIES GROWN IN THE HERBERT

Description of Rating	Smut Rating	Variety	Comment
RESISTANT Varieties with this rating will generally show "NO" adverse effects from disease.	1	CASSIUS, Q200$^{\phi}$	
	2	KQ228$^{\phi}$	
	3	-	
INTERMEDIATE Varieties with this rating are capable of resisting most of the adverse effects from smut. However, as disease pressure increases so does the risk of yield losses.	4	Q172$^{\phi}$, Q208$^{\phi}$, Q219$^{\phi}$	
	5	Q96, Q119, Q135, Q215$^{\phi}$	
	6	Q120, Q183$^{\phi}$, Q190$^{\phi}$,	
SUSCEPTIBLE Varieties with this rating will generally show "HIGH" levels of adverse effects from the disease and possibly total loss.	7	-	
	8	Q115, Q138, Q152, Q157, Q158, Q162, Q164, Q165$^{\phi}$, Q166$^{\phi}$, Q179$^{\phi}$, Q186$^{\phi}$, Q187$^{\phi}$, Q195$^{\phi}$, Q216$^{\phi}$, Argos$^{\phi}$, Mida$^{\phi}$ *	* = Indonesian trial rating
	9	Q117, Q174$^{\phi}$, Q194$^{\phi}$, Q204$^{\phi}$,	
Notable Exemptions		**Q99** ** (Rating = 1) **Q124** *** (Rating = 6)	** = Susceptible to Pachymetra root rot and RSD. *** = Susceptible to Orange rust, Yellow spot and RSD.

CANE PRODUCTIVITY INITIATIVE

PRODUCTIVITY FORUMS

Three rounds of productivity forums were held during the year. The first round, in late February and early March, covered the following topics:

- The Harvest Monitoring System proposed for the Herbert where GPS units would be mounted on each harvester for the entire season and would plot the path taken in each field harvested. The system would facilitate better matching of cane deliveries to individual cane blocks and help show whether blocks have been partially or completely harvested. Also proposed was a network of base stations which would enable growers and contractors to adopt GPS guidance and precision farming at a greatly reduced cost.

- Crop management practices for blocks to be harvested early. Practices such as closely managed, soil-specific fertiliser applications, control of crop age so that crops are as close as possible to 12 months of age and the use of chemical ripeners are all specifically aimed at maximising both CCS and sugar yields.

- Information package on MODDUS®, a new crop growth regulator from Syngenta.

- Feedback from the Herbert Season Length Optimisation Workshop held in late January.

- Publicity for the forthcoming Harvesting Best Practice Workshop.

The second round, held in early May, covered the following topics:

- Release of the Herbert district and sub-district Productivity Reports, an explanation of the wealth of information contained within them and how it can be used to assist on-farm decision making.

- The 2006 Herbert Variety Guide and how it can be used to assist decisions on which varieties to consider for planting on particular farms.

- Information on the new varieties Q183$^{\phi}$, Q217$^{\phi}$, Q218$^{\phi}$ and Q220$^{\phi}$ which became available to growers in 2006.

- Guidelines for the selection of suitable planting material that will produce high quality billets for planting.

- The dual cane consignment system for the 2006 season which consisted of both the old system and the new system involving on-board GPS units and data cards for transfer of information.

- A new tool for the economic analysis of farm data.

The third round, held in early October, covered the following topics:

- An update on the smut situation in the Herbert and survey activities aimed at finding out the extent of smut infected blocks.

- Early season results for the crop growth regulator MODDUS® and plans for conducting late season trials.

- A roving field tour of sites where aspects of the new Sustainable Farming Systems have been adopted and the opportunity of holding discussions with the growers involved. An inspection of one of the MODDUS® trial sites was also conducted.

RESEARCH AND DEVELOPMENT TEAMS

The four research and development teams continued to operate in the Herbert. Each team was guided by a plan of activities for the year, which was developed at the first meeting, and these were successful in promoting awareness of the latest R&D information and in facilitating the adoption of best management practices. Teams are made up of growers, harvester operators, extension and research staff. New members are always welcome so if you are interested in joining one of the teams please contact BSES or HCPSL.

HARVESTING R & D TEAM

This team met four times during the year to discuss ways of promoting the adoption of harvesting best practice and to find ways of improving the viability of the harvesting sector. The team undertook the following activities during 2006:

- A Harvest Best Practice Workshop held in March and attended by over 60 participants
- A new BSES Harvesting newsletter for the Herbert
- Discussions on ways to improve the adoption of wide swath harvesting innovations such as the Corradini 2 in 1
- Updates on Anthony Girgenti's HELP model
- Visits by the Tech Agro delegation from Cuba and disseminating information by their products being trialled on Robert Lyon's harvester such as onboard computer and electronic log book, automatic base cutter height sensor and yield monitor.

- A presentation on the work in the Tully area aimed at improving farm layout and crop presentation for harvesting
- Report back on a trip to Brazil and Cuba by an industry group.

VARIETY ADOPTION TEAM

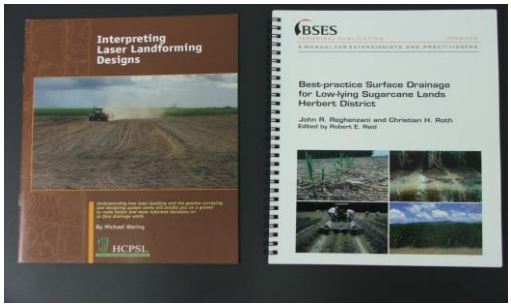
The team met five times during 2006 to discuss ways of improving the adoption of the most productive and profitable varieties for different parts of the Herbert. With the advent of smut in the Herbert the activities of this group were expanded to include smut management planning. The activities included:

- Development of a new Variety Guide which included descriptions and disease ratings for different varieties, optimum periods for harvesting and suitability of varieties to particular soils and environments.
- An industry workshop on the recognition and management of different varieties
- Selection of new varieties for release in 2006
- Results of RSD screening trials for approved varieties
- Propagation and promotion of varieties with resistance to smut
- Development of a smut management plan for the Herbert.

DRAINAGE AND WATER MANAGEMENT TEAM

The team met three times during 2006 to discuss ways of accelerating the adoption of improved drainage practices in the Herbert and to promote practices which minimise sediment and nutrient outflows. Two important achievements were made:

- The production of a booklet on 'Interpreting Laser Land-forming Designs' written by Michael Waring. This is aimed at improving growers' understanding of laser levelling and of surface drainage designs produced using the Geostar survey system. The booklet is available free of charge from Herbert Cane Productivity Services.
- The production of a manual on 'Best Practice Surface Drainage Guidelines for Low Lying Cane Lands in the Herbert District' written by John Reghenzani and Christian Roth. This drainage manual is available free of charge from BSES.



SOIL HEALTH AND CROP ESTABLISHMENT TEAM

The team met three times during 2006 to discuss ways of accelerating the adoption of more sustainable farming systems, of farming practices that improve soil health and that improve the establishment of plant crops. Its activities included:

- The commencement of an extension project which focuses on growers who have adopted components of sustainable farming systems on their farms such as spray-out of fallows, legume crops in fallows, preformed beds, minimum tillage planting with double disc openers and controlled traffic. Demonstration plots on a range of farms will be used to promote these practices at farm walks and at field days.
- Machinery for growers to use for sustainable farming systems, such as single and dual row double disc opener planters and a four row soybean planter have become available for hire from BSES free of charge.
- Discussions on soybean seed quality have highlighted the need to ensure that it has been stored correctly in low humidity cold rooms. Several germination failures have been linked to poor seed quality caused by inadequate seed storage facilities.
- Discussions on a new project aimed at developing improved varieties for cropping at wider row spacing revealed that one of the trials will be established on Ed Morris's farm in the Herbert.
- A presentation was given by Mark Poggio on the work he is doing to promote record keeping and a greater emphasis on economic analysis of farm business performance. He encouraged the use of BSES Paddock Journals and the Feat program for benchmarking farm performance.

PESTS AND DISEASES

PESTS - ANIMALS

General

As in the previous year, losses to pests were low. Damage from feral pigs was the exception.

Pigs

Feral pigs continue to be a problem where they occur. Serious damage is increasing not only in cane, but also to the drainage of the fields. Pigs rooting under the trash are digging wallows in the rows, interfering with drainage, resulting in costly repairs.

There have been some funds allocated for pig control and a trapping program, in the wet tropics.

Rats

Good in-field weed control limited the breeding potential of cane rats. Very little baiting occurred. There is currently in place, a permit to bait, valid until April 2007.

Cane Grubs

While damage from greybacks, the predominant species was quite low, a few isolated patches of severe damage did occur, mostly in old ratoons. In these fields, the effect of suScon or Confidor would have worn off. Again, Herbert growers treated much of the lighter textured soils which are susceptible to grub damage.

A few hectares were affected by Frenchi grubs, a two year life-cycle species.

Beetle flights were recorded from end November 2006 to beginning of February 2007. Species included Greyback, Frenchi and Grata. The flights were not indicative of unusual beetle numbers. Sensible control methods remain the key to keeping grub damage to a minimum.

PESTS – PLANTS

GSP

Areas of giant sensitive are increasing, with new infestations found. Immediate control measures are strongly recommended to avoid seeding.

Hymenachne

This aquatic weed is proving hard to eradicate. Several "clean-up" projects have had a temporary beneficial effect, but the weed soon comes back. There is a school of thought that geese and ducks spread the seed from place to place. There is an urgent need for an industry management plan involving all stakeholders which attracts long-term funding.

DISEASES

RSD

Ratoon Stunting Disease levels continued to fall, mostly due to grower diligence. Significant plantings of new varieties such as Q200 also played a part in this process.

Smut

As all would be aware, smut was found in the Herbert in December 2006. At time of writing, 19 farms have the disease, spread over 24 blocks. The varieties involved are Q158, Q157, Q174$^{\phi}$, Q204$^{\phi}$ and one stool of Argos$^{\phi}$. The first four varieties are also the most susceptible. Some 360 fields on 190 farms were inspected for Smut. In addition, fields adjacent to those found with the disease were also inspected.

A recommendation has been provided to the Watson committee that will allow the Herbert industry to retain the right to plant intermediate and susceptible varieties, in smut free regions, until 2008.

The Watson report was tabled in state parliament recently, with good outcomes for the industry generally.

Other Diseases

Orange rust affected Q165$^{\phi}$ and Q204$^{\phi}$. Brown rust also infected several varieties.

Good and sensible varietal rotation has limited the adverse effects and losses from *Pachymetra* root rot.

FARMING SYSTEMS

CONTROLLED TRAFFIC TRIAL RESULTS

The trial was established at the Herbert BSES Station (Fairford Road, Ingham) in 2004 on a 3.6ha fallow block with a silty clay soil. The trial consisted of three treatments and two replications. The treatments assessed were:

- Treatment 1 = conventional system @ 1.6m single row, furrow opener planting
- Treatment 2 = pre-formed mounds @ 1.6m single row, double disc planter
- Treatment 3 = pre-formed mounds @ 1.8m dual row, double disc planter

All treatments were planted with the variety Q174.

Bed Forming

The BSES farming system trial provided some valuable information on the agronomy and economics of different farming systems in the Herbert region. The trial displayed that the two new farming system treatments are a viable option in the Herbert region and can provide significant agronomic, economic and social benefits. The new farming system treatments incorporated some or all of the three principles advocated by the Sugar Yield Decline Joint Venture project: 1) legume fallow 2) minimal tillage and 3) controlled traffic.

Soybean Spray-out

Preformed Beds Post Planting

The1.8m dual row disc opener planted had the highest gross margin of $484/ha, followed by the1.6m single row disc opener planted treatment at $466/ha and the 1.6m conventional system treatment at $95/ha. The number of hours spent on farm planting operations decreased by over 40% with the new double disc opener planting systems. On a whole of farm basis this would represent a considerable improvement in the plant cane gross margin and overall farm profitability.

Conventional Vs Beds

The new farming system is progressively evolving and when fully developed will have the potential to reduce planting operation costs even further and improve farm profitability. The economic analysis does not take into consideration the fixed costs associated with a farming business. It can be expected that fixed costs will also decrease considerably because of the reduction in machinery, implements and time required to carry out the operations in the new farming system.

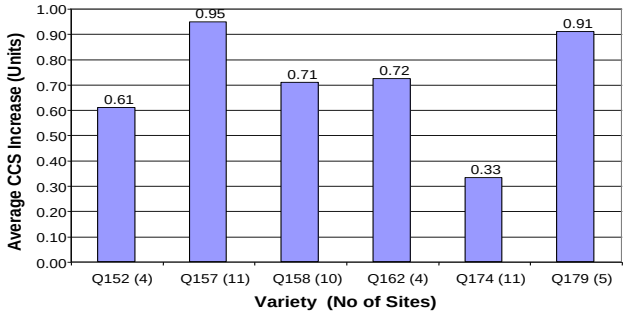
	Treatment 1 Conventional System	**Treatment 2 New System 1.6m**	**Treatment 3 New System 1.8m**
Price per tonne sugar	$350	$350	$350
Average yield cane	65.9t/ha	74.2t/ha	82.4t/ha
CCS	15.4	14.9	14.5
Revenue per hectare	$2367/ha	$2548/ha	$2726/ha
Growing costs per hectare (ex. labour)	$1585/ha	$1440/ha	$1550/ha
Harvesting costs per hectare	$455/ha	$512/ha	$569/ha
Gross margin per hectare (ex. labour)	$327/ha	$596/ha	$607/ha
Tractor labour at $20/hr	$232/ha	$130/ha	$123/ha
Gross margin per hectare (inc. labour)	$95/ha	$466/ha	$484/ha

SEASON LENGTH OPTIMISATION

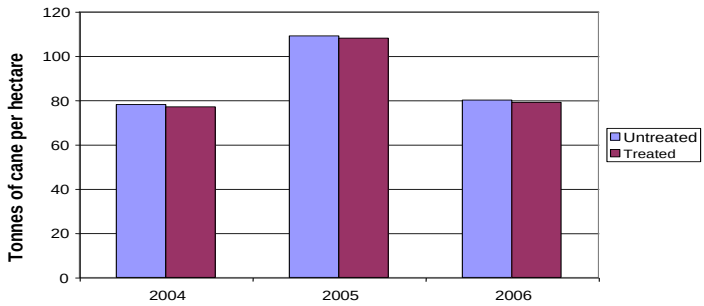
THE 2006 HERBERT MODDUS® PILOT PROGRAM

As part of an SRDC funded project (BSS264 Adoption of an Optimum Season Length for the Herbert), the research team (consisting of BSES Limited, CANEGROWERS Herbert River, CSR Sugar, HCPSL and QMCHA) investigated the opportunities to use crop ripeners or growth regulators to increase CCS and the possibility of using such products as a crop management tool. In 2004 the team commenced discussions with Syngenta to assess the usefulness of MODDUS® as a crop ripener. After trial work was completed in 2003-05 it was decided to establish the 2006 Herbert MODDUS® Pilot program.

In the 2006 program, Q174$^{\phi}$ was the least responsive variety in the Herbert with an average increase in CCS of 0.33 units. In contrast, Q157 showed an average increase of 0.95 units. Figure 1 below shows the average increase in CCS for all major varieties supplied in the Herbert program.



At harvest there was no significant difference in cane yield between the treated and untreated cane, as determined at the mill weighbridge. Figure 2 below shows the average cane yields for treated and untreated cane for the 2004-06 season in the Herbert.



The table below shows the monetary returns for MODDUS® application in 2006 early and late harvest trials in the Herbert. Calculations are based on the estimated sugar price = $375/t sugar

Time of Harvest	Average CCS Increase	Average cane yield (t/ha)	Average sugar yield Increase (t/ha)	Average increase in gross value ($/ha)
Early season	0.70	78	0.55	$209
Late season	1.36	87	1.18	$325

The 2006 MODDUS® pilot program in the Herbert was successful in demonstrating the commercial worth of the product through a CCS increase and an increase in monetary returns to the grower. This effect has been achieved with no significant reduction in cane yield across the district. The program has also suggested other potential benefits such as improved ratooning and an increase in nutrient and water uptake. The program has demonstrated that MODDUS® should be considered as a useful crop management tool into the future. In 2007 it is anticipated that the pilot program will be continued. Interested growers should contact BSES on 47762500.

VARIETY X TIME OF HARVEST TRIALS

The purpose of these trials was to assess what effect the time of harvest has on different varieties throughout the harvesting season. Yield, CCS, ratooning and monetary returns are being investigated.

All trials were harvested in 2006. The Blanco and Murray trials are now completed, and the Girgenti and Coppo trials will be harvested again in 2007 to assess ratoon performance.

All data have been collated and are ready for analysis. With assistance from the BSES biometrician, the data will be analysed in March 2007. The research findings of these trials will be reported at a later date.

NITROGEN RATE TRIAL FOR EARLY HARVESTED CANE

In 2006, the Minato trial was harvested once again to investigate reduced nitrogen rates for early harvested cane.

The results of the trial indicate that the lower nitrogen rate returned the greatest monetary return per hectare over the 2 years. Other trials conducted in 2005 have returned the same results. These results indicate that nitrogen rates can be decreased for early harvested cane with no adverse affect on yield or CCS.

Nitrogen Rate Trial – Variety Q157

Nitrogen rate (kgN/ha)	CCS		Cane yield (t/ha)		Gross $/ha		$/ha minus N fertiliser cost	
	Plant	Rat 1	Plant	Rat 1	Plant	Rat 1	Plant	Rat 1
116	14.0	12.3	78	90	1404	2098	1260	1954
150	13.9	12.4	79	86	1413	2028	1227	1841

Assumptions used for plant crop:
Sugar price- $270/ton
Harvesting and levies- $6.80
Nitrogen value- $1.24/kg of nutrient
Date harvested- 23/6/05

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

The trial has been retreated again in 2006 and will be harvested in 2007.

DISTRICT PROJECTS

WATER QUALITY PROJECT

This project has set up eleven sites around the district for monitoring the quality of water draining from cane farms. Individual growers or groups of growers have been taking water samples and have used nutrient test strips for measuring the nitrate and phosphate content of their farm run off. They have also estimated suspended sediment in the samples using turbidity tubes and measured pH and dissolved oxygen.

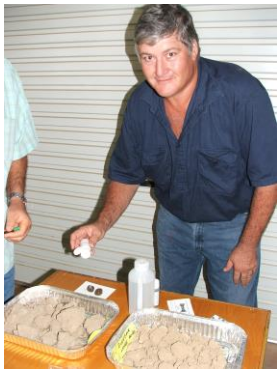
A local water testing laboratory has been established with equipment for measuring dissolved oxygen, pH, turbidity, chemical oxygen demand, nitrate and phosphate. This has enabled the accuracy of some of the grower measurements to be checked. It was found that the nutrient test strips overestimated phosphate and these are now being progressively replaced by portable colorimeters.

Paddock journals are being maintained with records of cultivation, herbicide, pesticide and fertiliser applications and the times of harvest of each block. Growers are also recording rainfall using rain gauges established close to each monitoring site and water flow rates through V notch weirs.

If you wish to find out more about the project or establish your own water monitoring site, please contact Keith Phillips on 47777428 who is coordinating the project and the operation of the water testing laboratory.

NUTRIENT MANAGEMENT PROJECT

Nine replicated strip trials comparing recommended fertiliser programs with those that growers would normally use were harvested and the results collated. The results showed that savings in fertiliser expenditure were possible without impacting on productivity. This may prove to be an important finding with the escalating price of all types of fertiliser.



Three nutrient management workshops using the 'six easy steps' approach were conducted during 2006. Two workshops were for growers and one for resellers.

FOCUSING ON FARM PROFITABILITY

A project funded by SRDC and DPI&F is currently underway in the Herbert and Burdekin region to enhance the understanding of economic principles and display its relevance to evaluating and improving farm profitability. Mark Poggio, FutureCane Agricultural Economist, has been working with growers to investigate various economic topics related to farming systems and some of the tools that may be used to assist with making on-farm decisions. Some of the most recent activities with growers include FEAT training workshops, benchmarking, ASSCT grower based paper and the economic analysis of smut and new farming system components in the Herbert and Burdekin regions. For more information please contact Mark Poggio on 47763907.

SUGARMAX MODELLING AND FIELD TO FACTORY PROJECT

As a part of the SRDC BSS264 Season Length Project modelling was undertaken to investigate options to increase CCS and monetary returns through alternative harvest scheduling. The modelling program developed by CSIRO is called SugarMax.

The modelling work investigated options at the following levels:

- Individual farm level
- Harvesting group level
- Sub- district level
- Whole of district level

The results of the modelling activity indicate that there are significant opportunities throughout the region to improve CCS levels and monetary returns through scheduling harvesting differently.

This work will become apart of the newly funded Field to Factory project. The new project will investigate alternative harvesting arrangements to maximise monetary returns across the value chain, improve harvest and transport scheduling and minimise down time associated with wet weather interruptions.

If you are interested in becoming involved in the Field to Factory project please contact CANEGROWERS or BSES.

The table below indicates some of the outputs from the SugarMax modelling system.

SUGARMAX Optimised Results: Wet and Dry paddocks within Group

Example Group

Sugar Price ($/t): $270 Rounds: 6 Season Length: 22

Maximum% taken per Round: 100 TCH Trends Used?: No

Equity $/Tonne $17.81	Optimised $/Tonne: $18.06	$/Tonne gained $0.24
Equity Gross ($) $945,653	Optimal Gross ($) $958,647	Gross Gained ($) $12,993

REGIONAL INITIATIVES

GROWER WEBSITE

The grower website contains a great amount of valuable information for those people who have maintained a good consignment system throughout the season. There is a range of excellent reports available showing farm and variety performance. One of those reports is the productivity summary. It is found under:

Reports → **Farm Prod Reports**
→ **Productivity Summary**

This will give you an analysis for how each variety performed on your farm and also a comparison of your plant and ratoons. Another report of interest is the benchmark report, and is found at:

Reports → **Farm Prod Reports**
→ **Benchmark Report**

This report shows how your farm's plant and ratoons performed against your productivity district average and also against the best result in your prod group.

To log into the site you will need a username and password which can be obtained by phoning Julie Cantoni at the mill. If you are not confident in navigating the site you are quite welcome to come into the HCPSL office (with your details) and see the staff who will help you learn your way around the site.

HERBERT REGIONAL ADVISORY GROUP

The Herbert Regional Advisory Group (HRAG), consisting of Herbert industry and community representatives, continued to provide strategic direction to the Herbert sugar industry, in conjunction with the Regional Industry Board, during the 2006 season, and will continue to do so with the release of the *Herbert Sugar Industry Regional Strategic Plan 2007-2012* in March 2007. Six Herbert Regional Community Projects were submitted to the HRAG in July before being forwarded to the Sugar Industry Oversight Group for consideration. Three of these projects were successful:

1. Harvesting Management Systems (Stage 2) Infrastructure in the Herbert Region - Herbert Cane Productivity Services Ltd (HCPSL). Up to $356,250 to set up integrated, geospatial, crop-yield monitoring systems in all harvesters (which are already fitted with GPS–harvesting monitoring systems) in the Herbert district. This will help boost regional productivity, save costs and improve regional decision-making.

2. Enhanced information to support improved management of cane, harvesting, milling and R, D&E in the Herbert - CSR Sugar (Herbert) Pty Ltd. Up to $756,200 to install NIR Cane Analysis Systems in Herbert's sugar mills. They will allow speedy feedback to growers on nutrient management, to harvesters on cane quality, to mill operators on cane characteristics and to RD&E agencies on variability in cane analysis parameters within farms, sub-districts and across the region.

3. Farming Systems Innovation – 'Hedge-row planting' a single pass, broad row cane planting system - Estate of L. Mizzi and Y, P & C Mizzi. Up to $44,063 to speed up use of a proven farming system that will reduce planting costs by about 50 per cent without affecting productivity. Hedge-row planting involves controlled traffic (1.8m), mound planting of a wide band of cane in a single pass.

VISIT TO BRAZIL AND CUBA

A group of sugar industry representatives recently travelled to Brazil and Cuba, to assess harvesting automation technology. The group also investigated the Cuban company Tech Agro, as a viable business and to confirm levels of client satisfaction. The company mainly operates in the Brazilian sugar industry. The tour was funded by the Sugar Research and Development Corporation (SRDC).

Tour participants were –
Mr. Ian Haigh, grower and contractor, Burdekin
Mr. John Powell, grower and QMCHA Executive Officer
Mr. Lawrence Di Bella, grower and BSES Herbert Extension Officer
Mr. Ron Kerkwyk, Manager, HCPSL

The goals of the visit were accomplished, with the results presented at productivity forum meetings.

Tech Agro's technology is widely used in the Brazilian Sugar industry and Cuban transport systems. The company has a very good reputation for after sales service throughout Brazil and Cuba.

Brazil is simply huge, currently producing around 400 million tonnes of cane. This will increase to 800 million by the year 2020, and is driven by Ethanol. Their sugar industry is highly motivated, very well organised, with high levels of investment in research and development. Their only handicap is the cost of transporting sugar to the coastal ports.

Cuba has a sugar industry in decline. We saw several derelict mills, and areas previously under cane being planted to citrus and other crops. The current trade embargo is a further stumbling block for them, in terms of obtaining equipment. It is unlikely that Cuba will ever reach historic levels of production.

In Cuba, the study group resided in a ministerial guest house in Havana. The tour group also delivered presentations to the Cuban Minister for sugar.

We thank SRDC, BSES and HCPSL for the opportunity to undertake this visit.

Thank you to all those who have participated in and contributed to the cane productivity initiative over the past year