

Cuban technology backs sugar harvest breakthrough

Where's that harvester? In the Herbert River district a harvester tracking system is being used to relate yield to paddock area and to improve management of cane transport and processing.

Bill Kerr

The sugar industry is taking a slightly different approach to the adoption of PA, which may offer some new ideas to other industry sectors.

Precision cane farming and harvesting in the Herbert River district took an exciting leap forward this year, with harvesters using state-of-the-art yield monitoring and tracking technology as part of an ambitious program designed to ensure district profitability and sustainability.

In addition to the harvesting initiative, an increasing number of tractors and other farm machinery will have access to a co-ordinated district-wide GPS base station network, allowing growers to cut costs, improve efficiency and potentially increase cane/sugar yields and financial returns.

Herbert River district's commitment to securing its sugar future was

evident at the recent Sugar Research and Development Corporation's (SRDC) annual innovation awards where the Herbert Information Resource Centre won top honours for its GIS knowledge sharing enterprise.

Industry stakeholders are collaborating at various levels to exploit opportunities for developing better risk management and industry sustainability.

The systems approach has positive implications for other regions through streamlined harvest management and better communications and decision-making.

Ron Kerkwyk, Manager, Herbert Cane Productivity Services Ltd

(HCPSL), sees considerable potential to increase total sugar production, Commercial Cane Sugar (CCS – approximately equal to content of sucrose), sugar yields per hectare and grower profitability through better management of harvest scheduling and decision-making based on regional variations in CCS, soils and climatic conditions.

Selecting optimum times for harvest start/finish in different areas and even particular blocks on individual farms can substantially influence sugar produced and an enterprise's profitability.

HCPSL's initiative has greatly reduced the cost to individuals of adopting new technology. Farmers and CSR Sugar are each paying 2.5c/t to



Lawrence Di Bella (L), HCPSSL Agricultural Systems Information Officer, discusses the harvester monitoring device that will be used to track sugarcane harvesters in the Herbert River District with (L to R) Santiago Marrero, General Manager of Techagro Pacific and his colleagues Angel Luis and Enrique Caballero.

rate fertiliser application, adding lime and gypsum, and other best management practices.

Lawrence Di Bella, who was with the Bureau of Sugar Experiment Stations (BSES) for 17 years before joining HCPSSL, says paddock yields can vary from 20 to 140t/ha. He stresses that yield monitoring data should not be used in isolation from other information such as soil and plant tissue analysis data, soil and topography maps, aerial photos and remote sensing data.

This year 78 Herbert harvesters will be fitted with Techagro on-board computers and Next G™ modems and 20 equipped with the Techagro yield monitors. Another 40 will be fitted with AgGuide yield monitors.

Eight machines will be fitted with the Techagro automatic base-cutter systems. The BSES harvester at Ingham will also be fitted with the two yield monitors to compare the performance of each system.

Field position of individual harvesters will be recorded every 10 seconds and HCPSSL staff will be able to communicate with machine operators. A dedicated Techagro computer server at HCPSSL will also have access to accurate weighbridge information from CSR and GIS data through the Herbert Information Resource Centre.

HCPSSL's Mike Sefton, who will oversee the program, says the new technology will allow harvesting groups to track their harvesting "to the nearest drill" as well as giving mill management better control over transport and processing of cane.

He says the challenge for the industry now is to convert available data into usable information/applications that growers and millers can use to make practical, profitable business decisions.

He expects even bigger payoffs as the harvester system evolves e.g. if automatic base-cutter height sensors could pick up an extra 2 to 3t/ha of high value cane they would generate in excess of \$1m for the district.

How is it that technologists from a small Caribbean country are

establish the \$380,000 GPS network but the Federal Government is paying the full \$620,000 cost for on-board computers and yield monitors. The Government will share with cane harvesting contractors the \$144,000 cost for automatic base-cutters and auto-steering of harvesters.

HCPSSL has negotiated an agreement with Cuban R&D company Techagro Pacific to implement much of the new technology. The initial focus is on yield monitoring and data collection and distribution, but

automatic base-cutter systems and harvester performance reporting is also in the wings.

Last year five Techagro units on harvesters mapped about 400ha and 30 AgGuide units mapped approximately 10,000ha. Data gathered was used to produce yield maps that can be used for precision agriculture and to determine why parts of blocks planted with the same cane variety may yield differently. Precision agriculture can help growers contain and reduce input costs through variable

working at the cutting edge of Australian harvesting innovation? Although Cuba was once a global force in sugar production, its output plummeted from 7Mt to 1.2Mt after the former USSR scrapped its sugar-for-oil preferential trade arrangements. Faced with a domestic industry in decline, Cuban researchers began developing integrated control systems for mills and plantations in booming Brazil and other South American countries.

CSIRO scientist Robert Bramley learned about the breakthrough work Cubans were doing in Brazil when he attended an international conference.

This led to a visit here by specialists from Techagro, commercial arm of a consortium of Cuban and Brazilian universities and research bodies.

They visited the Herbert, Burdekin and Mackay to assess opportunities and they trialled equipment on several harvesters including the Ingham machine owned by Caneharvesters Chairman Robert Lyon. This aroused interest among growers who were keen to reduce their harvesting costs and improve productivity, but were frustrated by lack of suitable equipment. Interest was particularly strong at Ingham, where Techagro has now based its Pacific regional operation.

In 2006 SRDC helped fund a visit to Cuba and Brazil, to see Techagro

systems in action, by a group including Lawrence Di Bella and Ron Kerkwyk, Burdekin grower Ian Haigh, John Powell of Caneharvesters Mackay and Gary Sandell, a Mackay-based harvesting consultant.

In Brazil, large numbers of harvesters have been fitted with on-board computers, electronic logbooks, base-cutter height sensor kits, yield monitors and automatic constant flow systems.

Seven Cuban technologists (some with their families) have made Ingham their temporary home while they work closely with HCPSL to adapt their equipment to suit the local system of small farms and faster harvesting rates.

Ingham was chosen because of the district's innovative, progressive culture and its standout enthusiasm for innovation and achieving best practice.

The community is delighted to have overseas experts living locally, close



HCPSL Agricultural Systems Information Officer Lawrence Di Bella (L) and Techagro Pacific engineer Angel Luis inspect one of the monitors that will be fitted in the cab of the cane harvesters to track movement and record yield.



HCPSL Harvest Management Officer Mike Seaton (seated), Techagro Pacific engineer Enrique Caballero and HCPSL Manager Ron Kerkwyk (R), prepare to fire-up the Techagro server that will be used by HCPSL to track cane harvesters in the Herbert River district.

to where things are happening on the ground. This is a wonderful bonus, said Ron Kerkwyk. "The partnership is a good marriage of Cuban harvest management technology with our industry experience and skills".

"The stakeholders share a vision for a more efficient and profitable industry and, importantly, Techagro does not have to work directly with every stakeholder because HCPSL coordinates the entire operation."

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