A collaborative approach to Precision Agriculture RDE for the Australian Sugar Industry

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Rather than testing commercially available sensors, the work described in this article sought to evaluate the yield measurement concepts. These concepts included the pressure drop across the elevator and chopper motors, a load cell in the elevator floor and the angle of opening of the top feed roller. These concepts cover those being employed in the commercial units, both past and present.

Trials were conducted during the 2010 season in the Bundaberg region and in both the Bundaberg and Herbert regions in 2011. Campbell Scientific CR3000 dataloggers were used to read each of the sensors at 40 Hz and record the averaged value every second, along with GPS coordinates. In addition to this sensor data, sugarcane yield was also measured directly to determine the accuracy and resolution of the respective yield monitoring concepts. Yield was determined using two methods - mill (bin) weight data for individually consigned sub-blocks and weighed 50 m row samples.

The initial analysis of the data consisted of a visual comparison of the sensor derived yield maps (see Figure 1). The yield maps derived from chopper power, elevator power and the volumetric measurement (roller opening) had the greatest agreement, in absolute value, with the range of values being tighter for the loadcell-derived yield maps.

Rather than being overly concerned about absolute accuracy as displayed in Figure 1, the maps shown in Figure 2 have been displayed in high-medium-low to compare spatial structure. The high and low yielding areas can be seen to occur in the same locations on all maps and this is in agreement with the 50 m derived map. The main area of inconsistency in the maps occurs at the ends of the field. When the harvester leaves the field, there is a sequence of events that include the chopper being turned off when the elevator is still operating. The reverse of this is true when re-entering the field (i.e. chopper on with elevator off).

Figure 1 (right) | The yield maps for each of the monitoring concepts (CP-chopper power, EP-elevator power, LC-load cell, RO-roller opening).

Figure 2 (below) | The yield maps for each of the monitoring concepts shown in 20th percentiles (CP-chopper power, EP-elevator power, LC-load cell, RO-roller opening, 50 m-derived from the weigh bin data, with raw and kriged data being shown).
Congratulations Alison and Trevor

The 2012 Bundaberg Sugar Industry Productivity Achievement Awards where held on Friday, 18 February. This annual event recognises the outstanding achievements of local growers, millers and service providers.

Amongst the winners on the night were BSES Limited staff Trevor Willcox and Alison Findlay.

Trevor received the Contribution to Productivity Award, and Alison was presented with the Young Industry Achiever award.

Trevor commenced his employment with BSES in January 1970. He was District Productivity Coordinator at Bundaberg in the 1990s and returned as Area Development Manager in 2004 and is currently Extension Leader – South. Trevor said an award such as this means alot to him, as they show that the industry appreciates the productivity improvements that result from BSES extension.

Alison commenced her employment as a Technician with BSES in January 2007. Alison said she was honoured to receive the award, and hopes her work has contributed positively to the industry.

PICTURED | Trevor (above) and Alison (below) receiving their awards from Ray Hatt, General Manager of Bundaberg Walkers.