



Yield monitoring a useful tool to inform harvest best practice

Using a yield monitor is delivering potential to improve harvesting practices, as well as for lifting productivity through precision agriculture.

BY BRAD PFEFFER

Yield monitors and mapping are common in the Australian grains and cotton industries.

But in the Australian sugarcane industry, it is a different story.

With the huge mass of billets passing through the harvester, plus extraneous matter with little to no sugar, it has taken longer for yield monitors to make their presence widely felt in the Australian industry.

However, this has been changing in recent years, with major manufacturers offering yield monitors for their machines, which adds to the range of after-market products that have also been available in different forms over the last 20 years.

Herbert River district farmers and contractors Vince Russo and Steve Guazzo own Hamleigh Harvesting.

They cut over 120,000 tonne each year including their own cane and the cane of four other growers, covering a bit over 1,200 hectares.

When they decided to purchase a John Deere CH570 in 2017, they were eager to investigate the additional value that could come with the yield monitoring equipment and mapping software available through John Deere.

The Harvest Monitor works when high-resolution stereoscopic optical sensors scan the flow of cane as it passes through the elevator. The sensors can differentiate cane volume from trash while four light-emitting diode lights illuminate the sampling area to ensure visual clarity is uninterrupted.

"The monitor measures yield, pour rate and extraneous matter in real time, providing very powerful information," Vince said. "We are happy with its accuracy and see that it is providing data that can inform a range of management decisions."

Vince has been heavily involved in a range of activities locally – and across the industry – to improve sugarcane harvest efficiency, and he saw the information from the yield monitor and the easy-to-use multilayer maps and graphics as another tool that could help deliver optimum harvest outcomes.

He has been involved with in-field trials with SRA, which have been looking to find the sweet spot for reducing sugar losses. These trials see growers, contractors and millers collaborating to extract more value for the industry.

Through the trials, it is well understood that there will always be some sugar and cane lost through the mechanical harvesting process. Every cut, every moving piece of machinery, and the fans on the harvesters create various amounts of losses of cane and juice.

The variety, the size and shape of the field, the weather on the day, the size of the crop, and even the time of day all have an impact on recovering sugar. On top of that, the harvester comes into the equation: its forward speed, its pour rate, and the speed of the fans and other components all have an impact.

Harvesting contractors also face considerable economic pressure in getting the job done, and also in trying to match the cane harvested to the supply of bins.

This all results in a complex equation where operators are balancing the economics with the conditions of the day and delivering the best job possible.

The trials with SRA, which also include an economic assessment by the Queensland Department of Agriculture and Fisheries, are aiming to determine just how much of the value can make its way back into the pockets of the value chain.

For Hamleigh Harvesting, the yield monitor is helping them enhance the information received through the trials. One of their benchmarks for maximising sugar recovery is running at a 90 tonne per hour pour rate through the machine at a fixed fan speed of 710 rpm.

By sticking to these parameters, their driver then regulates his ground speed accordingly, which Vince said they believed was delivering the best result.

"The machine is capable of much greater throughput, but we believe 90 tonnes per hour pour rate is a good benchmark."

He added that the monitor also helped form a clear picture of the cost of harvesting. For example, the monitor helps highlight how paddock factors such as row length and crop class impact the cost of harvesting such as through fuel use.

Beyond that, he added that yield maps had significant management potential through precision agriculture.

"For example, you can layer a yield map with an elevation map to look at areas where poor drainage could be impacting productivity," he said.

"And if it is not a drainage problem, it also gives you the chance to go in with soil sampling and see what else is going on, and then take action accordingly," he said. "The yield map really gives a better picture of what is happening in the field, and the next step is making the most of that information."

He also hopes that a better harvesting result will lead to improved profitability through extending ratoon life, by lifting productivity in low-yielding areas and improving harvest efficiency.

"We want to be maximising our investment and ensuring our plant crop leads to as many healthy and good-producing ratoons as we can get. The yield-mapping can help to improve the consistency across a block for that." ■

SRA has also invested in recent research into precision agriculture, which included work on yield monitors, as part of a project called Delivering precision to users of Precision Agriculture in the Australian Sugar Industry – Yield Monitoring, led by Troy Jensen at the Centre for Agricultural Engineering at the University of Southern Queensland.

The in-field trials are part of a project funded by the Department of Agriculture and Water Resources Rural R&D for Profit program. This program is also supported by the Queensland Government Department of Agriculture and Fisheries.



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(Over page) Vince Russo says that yield monitoring equipment and software opens up a range of management options.