TAKING THE NEXT STEPS WITH HARVEST EFFICIENCY

For Tully grower Brian Dore, the numbers behind harvest optimisation are fairly obvious.

Like most growers and contractors, he had seen the trial data and been to workshops that described the data of harvest optimisation.

However, grabbing that information and using it in the paddock required careful consideration.

The Dore family run a John Deere CH570 and cut a contract that runs across 1200 hectares, ranging from 110,000 to 130,000 tonnes depending on the season. About half of the cane is that of Brian and his two brothers, Jamie and Greg, with the remainder being contract work.

"With the size of our contract, we felt our harvesting parameters were set in stone until we could see a full cost/benefit analysis," Brian Dore said. "We've cut this size area for about seven years and any changes would also mean changes to scheduling and putting on more men."

"It's not just a matter of slowing down the machine. Do that and everything changes, so we needed to understand what that means."

This led Brian to working with SRA on an in-field harvest losses trial.

The trials also helped the Dores identify the impact of crop presentation (row profile, field conditions and varieties), harvester machine setup and operator performance.

For example, the graphs presented here are from a relatively sprawled sugarcane crop of Q231$^{(f)}$ which was part of the trial. The graphs indicate how harvester fan speed effects the total harvestable material left in the field, and associated cane loss and sugar loss.

As the fan speed increases the total harvestable material left in the field (extraneous matter, sugarcane juice and billets) also increases (Figure 1). The total harvestable material left in the field includes material coming from the primary and secondary extractors of the harvester.

The total harvestable material left in the field has associated cane (billets) and sucrose (juice) losses which are shown in Figure 2 and Figure 3 respectively. As the fan speed increases cane losses also increase (Figure 2). Likewise, as the fan speed increases, the sugar loss increases (Figure 3).

As harvester fan speeds were increased so too has the total harvestable material left in the field and associated cane and sugar loss.

Operating sub-optimal harvester fan speeds will also increase the percentage of extraneous matter being sent to the mill which has significant impacts on CCS, transport costs and milling processes. Depending on sugarcane crop presentation, harvester machine setup and operator performance there is a balance between effective harvester cane cleaning and cane and sugar losses.

Brian Dore sees that there is an opportunity to use such information and bring it together with economics to help the industry determine that balance or the 'sweet spot' for harvest optimisation.

This work is currently underway, with SRA developing a Harvesting Predictive Model that will assist in decision making around harvesting parameters and provide information on the benefits and costs attributed to the grower and harvesting group.

Further development would be required to further extend that model into a broadscale tool for the entire industry.

"The economics of harvesting best practice are critical to decision making. The model would incorporate harvesting cost change estimates linked to harvester settings such as labour, repairs and maintenance and fuel costs."

It will be tested with industry this harvesting season, on a small scale.

In terms of the tool and its future refinement, development and release, Brian Dore said this would be valuable in helping move forward harvest optimisation for the industry.

"This helps pull it all together," he said. "We are all facing different varieties, different cutting conditions, different crop classes. All of those factors come in to play. As a contractor, I'm looking for information on what the pour rate should be on particular blocks and then how much time to schedule for particular blocks. ■

(Over page) *Tully grower and contractor Brian Dore says there is good data behind harvest optimisation, but implementing change is complex and requires consideration of a range of factors*

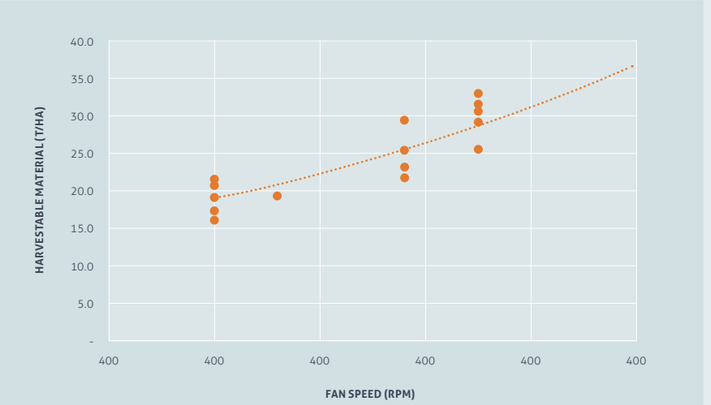

Figure 1: *Total harvestable material left in the field at different harvester fan speeds*

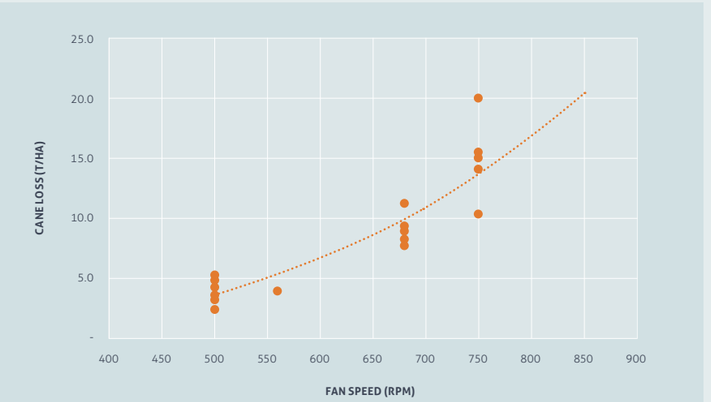

Figure 2: *Sugarcane loss at different harvester fan speeds*

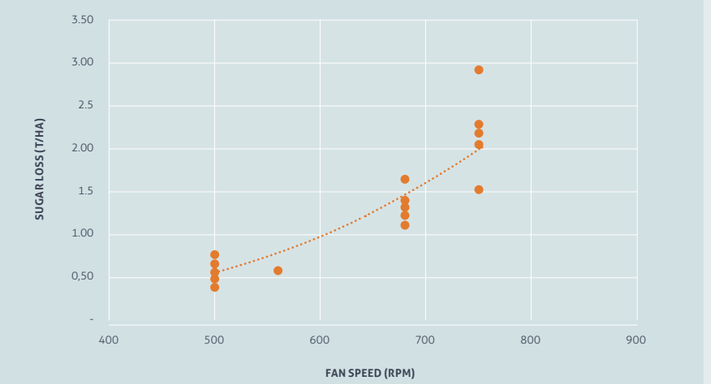

Figure 3: *Percentage of sucrose loss at different harvester fan speeds*