

Reduce harvester losses: Dollars in your pocket not in the paddock

Harvesting losses are a major cost to the sugar industry; in particular the loss of millable cane via the cleaning system during green cane harvesting. Losses as high as 20 per cent have been recorded, but 5-15 per cent is more common.

For harvester trials in the past, the biggest problem was the lack of an accurate cane-loss measurement technique. The traditional 'blue tarp method' of cane-loss measurement underestimated cane loss. A more accurate method that could measure juice loss during harvesting was required.

Infield Sucrose Measurement System (ISMS)

A five-year harvesting project, which developed a mobile harvesting-loss measurement system, has significant benefits to the industry.

The ISMS prototype has been used industry-wide over recent seasons by SRA's engineering team to measure losses. Losses of \$200/ha to in excess of \$1500/ha have been measured.

The process

Samples containing trash, billets, juice and tops are collected, either directly from the harvester or from a measured area (quadrat), and weighed to calculate total tonnes per hectare of residue.



Image 1: Collection of residue.

The field residue is then mulched and processed to obtain a liquid extract which is analysed using a digital Brix refractometer to measure sugar content.

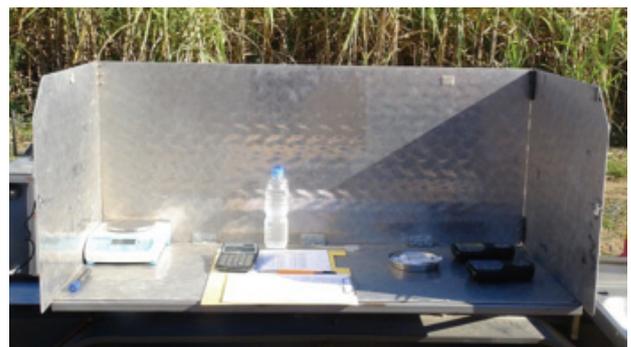


Image 2: Field lab for in-field sucrose measurement system.

From this information, the dollar value of sugar losses at different extractor fanspeeds can be calculated. Sugar loss in tonnes per hectare, and mill CCS are used to calculate how many tonnes of cane are being lost.

The field trial data in Table 1 shows the percentage of the crop lost at different fan speeds and the financial cost of losses for a 1000 ha harvesting group (e.g. at a 90 t/ha average yield this would represent a 90 000 tonne harvesting group).

It is important to note that some losses are unavoidable. The process of cutting cane (basecutters and chopper knives) results in losses of 3-5 per cent.

Extractor Fanspeed (rpm)	Crop loss (%)	\$ Loss/ 1000 ha
950	7.1	475 000
1050	16	1 080 000
720	3.6	210 000
900	9.6	560 000
760 Primary	3.4	220 000
760 Primary + Secondary	10.5	680 000

Table 1: Percentage cane loss and financial loss at different fanspeeds.

Figure 1 shows that as fanspeed increases, cane loss triples whilst extraneous matter (EM) is reduced by less than 2 per cent. Excessive fanspeed severely reduces income to all sectors with minimal improvement in cane quality. It is important that the impact of reducing fanspeed on EM levels is managed carefully.

At very low fanspeeds the extra trash reduces sugar recovery at the mill and increases transport cost.

Fanspeed vs EM & Caneloss 7.5 t/ha increase in losses for 1.85% reduction in EM

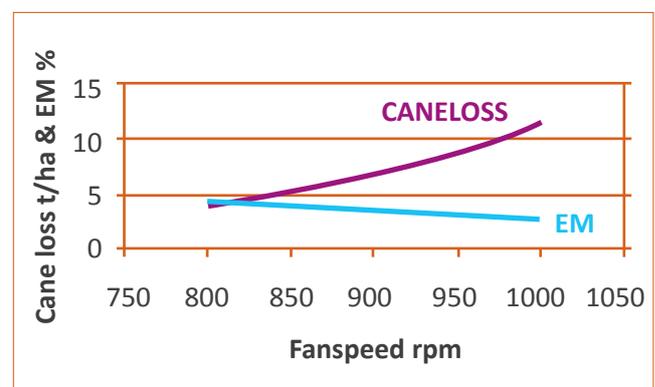


Figure 1: Indicates how harvester fanspeed can affect cane loss and extraneous matter.

Benefits of the ISMS

- Reduced harvesting losses.
- Rapid/accurate feedback on losses.
- Improved dollar returns to the grower, operator and miller.
- More cane to the mill.
- Ability to assess the performance of aftermarket modifications.
- 5-15 per cent increase in harvested cane would benefit the entire industry.