



2019 HERBERT HARVESTING DEMONSTRATION PROJECT - SWEET OUTCOME FOR GROWERS AND CONTRACTORS



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Research dating back to the 1970s has proven that mechanical harvesting results in cane loss out the extractor. These losses can be minimised and converted to additional yield and revenue for the Australian sugar industry, and it is expected that full adoption of Harvesting Best Practice (HBP) has the potential to deliver an additional 1.2 million tonnes of cane and 164,000 tonnes of sugar valued at over \$69 million (an additional \$2.86/t of cane) for industry.

This significant growth in yield and revenue can be achieved without any increase in area under cane. To raise awareness of this substantial opportunity for the Australian sugar cane industry, SRA and their project partners, including the Department of Agriculture and Fisheries (DAF), embarked on a Rural R&D for profit funded program. The program included an adoption component to strengthen the knowledge, skills and capacity required for practice change in the harvesting sector. Results from 95

fully randomised and replicated green cane trials during the 2017 and 2018 season indicated both cane and sugar yields for the recommended practice were 5.2% and 5% (respectively) higher than standard harvester operator practice.

But how does HBP affect a harvesting contractor's commercial operation? There is widespread acknowledgement in the industry that harvesting contractors are generally trying to deliver the best outcome for their growers in a very constrained environment. There is significant pressure on harvesting groups to harvest at high flow rates to ensure bin allotments are filled and throughput maximised. Growers and their harvesting contractors may be concerned that a reduction of flow rate into the machine will see a spike in harvesting costs greater than additional revenue generated from HBP yield gains.

Understanding the impact of reduced flow rates to contractor harvesting costs is

essential to the adoption of HBP. To address this knowledge gap, the DAF harvesting team economists developed a detailed cost comparison model, expanding on work done on the BSES Harvest Haul model. The cost comparison model was used to perform cost evaluations for nine of the 2017 and 2018 project green cane trials. Results from these evaluations across the industry indicated the increased cane and sugar yields generated by the recommended practice increased grower gross revenue by \$181/ha (4.8%) but reduced ground speeds increased the average cost of harvesting by \$61/ha (excluding any additional incentive payments to the harvesting contractor). Subtracting the additional harvesting cost (including fuel and levies) from the gross grower revenue indicated an average net benefit of \$120/ha for the trials.

SHOW ME THE MONEY!

In 2018, following a fact finding trip to the Isis mill area, a group of innovative Herbert growers and contractors wanted

to validate research outcomes in an average day-to-day harvesting scenario. "Show me the money!"

In response the 2019 season had the SRA / DAF harvesting team, with support from Wilmar Sugar, Herbert Cane Productivity Services Limited and Herbert River Canegrowers deliver the industry's first month long commercial harvest demonstration round in the Herbert. Two volunteer harvesting groups alternated between commercial (standard practice) and recommended (HBP) settings across their entire contract for one round during the 2019 harvesting season (round three of four rounds or 25% of the growers' crop). This included a total of 12 demonstrations for nine growers between both groups. A full rake was analysed at the mill to compare yield data between commercial and recommended settings.

Results suggested that in a normal commercial operation cane yield per hectare increased by 4.9% and sugar yield per hectare increased by 5.2% (both significant) when the contractors moved from standard to recommended practice. These outcomes closely align to the percentage yield increase observed across the 95 field demonstration trials conducted in 2017 and 2018.

However, while yield gains remain important, a key objective of the program was to understand the cost implications for the harvesting contractor, and resultant net revenue benefit for the grower (after compensating the harvesting contractor to move to recommended practices). The harvesting team's DAF economists used their cost comparison model to complete the trial costings. Each analysis of the 12 demonstrations identified the full spectrum of costs (machinery depreciation, labour, fuel, maintenance, etc.), drawing upon

demonstration data and requiring a substantial amount of operational information to be collected from the respective harvesting operations.

Total grower revenue was calculated using the five-year average sugar price (\$418/t), yield and CCS results (for each trial), together with the cane payment formula specific to the Herbert. Net grower revenue included total grower revenue less harvesting costs (including fuel) and levies. Actual harvesting costs and levies were \$37/ha (\$0.07/t) higher for the recommended setting due to higher yields, reduced harvester ground speeds and lower extractor fan speeds. Despite the higher harvesting costs, recommended settings obtained significantly higher total revenue (\$150/ha, +4.7%). This resulted in an overall net benefit of \$114/ha (+4.4% higher net revenue to the grower after taking into account the \$37/ha increase in harvesting cost), in adoption of recommended settings. The table below compares the increase in grower revenue, change to harvesting cost and grower net benefit after compensating the harvesting contractor to move from standard (commercial) practice to recommended (HBP) practice.

Field trials have consistently demonstrated the production and revenue gains of HBP, but the work undertaken by the harvesting team's DAF economists on the Herbert demonstrations proved the critical information required to support the decision making process between the grower and his harvesting contractor when planning their harvest.

The 2017/2018 field trials and the Herbert commercial demonstration project has identified there is now a need to move from field trials to a directed and well-structured strategy to link the awareness

of research outcomes to the actual ability to convert identified losses into yield gains. To address this gap, the SRA/DAF harvesting team is now focused on:

- Delivering a decision support tool to assist growers and harvesting contractors in their decision-making process when planning their harvest,
- Mentoring and supporting growers and harvesting contractor's through knowledge building workshops and field days, leveraging off group and peer to peer learning,
- The development of an affordable operator training program in harvesting best practices,
- Further investigation into the cost and implications to the milling and transport sectors, with a particular focus on cane supply logistics and milling efficiencies. ■

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The harvesting team extend its sincere appreciation to the participating harvesting contractors – Dwayne and Damien Morelli and Mark Chiesa for participating in this pivotal demonstration. Finally, our grateful thanks go to Wilmar Sugar, Herbert Cane Productivity Services and Herbert River Canegrowers. Without their crucial input and support this project would not have been possible.

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Table 1: Herbert commercial demonstration vs 95 Industry Field trials (2017-2018)

OUTCOMES	2019 HERBERT HARVESTING COMMERCIAL DEMONSTRATION PROGRAM	2017 2018 95 INDUSTRY (HARWOOD TO MOSSMAN) FIELD TRIALS
Per Hectare	Recommended Practice	Recommended Practice
% Yield Increase (tph)	+4.9%	+5.2%
% Sugar Increase (tsh)	+5.2%	+5%
Increase in Grower gross revenue	\$151	\$181
Increased cost to harvest at HBP	<\$37>	<\$61>
Increase in Net Grower Benefit	\$114	\$120

*Cost increase per tonne

(0.07/t)

(0.22/t)