



## Singing on the same song sheet: Examining harvester speed & components



David Bartlett discusses billet length with Stuart Norris during the trials.

*Three modified sugarcane harvesters are part of field trials this season to examine improved synchronisation of ground speed and front-end components of the harvester.*

This new research is looking at the front end of sugarcane harvesters to see if their components can be better matched to ground speed.

The idea is simple. Currently, on factory-standard machines, the spirals, basecutter and knockdown and fin rollers are not specifically coordinated with the forward speed of the harvester.

All of these components play a crucial role in impacting quality of the cane supply, sugar loss, and ratoons, with previous research suggesting there is significant damage occurring even before the cane reaches the basecutters.

The research is asking the question: can the front end be improved?

As part of that question, Norris ECT is working with QUT on a project that is part of the Rural R&D for Profit project, *Enhancing the sugar industry value chain by addressing mechanical harvest losses*, which is funded by the Australian Government Department of Agriculture and Water Resources, SRA and QUT.

In 2017, field trials have begun assessing modified John Deere 3520s at northern NSW and Childers and a Case 8000 with Wilmar in the Burdekin.

*CaneConnection* caught up with Stuart Norris from Norris ECT in August while field trials were underway in the Tweed Valley at a property managed by David Bartlett.

"If you do some analysis, it looks like none of the front end components are really that well suited to the speeds and conditions we harvest at currently," Stuart said. "By doing these trials, we are hoping to determine the impact of the current speed of those components and is there any negative impact on yields. Is there some way to fix it to allow us to continue to harvest profitability?"

The 3520 at Condong, run by Tweed Valley Harvesting, has had another controller added that allows control of the speed of the basecutters, spirals and fin and knockdown rollers, so their speed can be changed and also automatically linked to ground speed.

Working in a block of dual-row 1.9m one-year old burnt cane, the trial involved four treatments:

- Low speed at factory front-end settings (4 km/hour)
- Low speed at synchronised front-end settings (4 km/hour)
- High speed at factory front-end setting (8 km/hour)
- High speed at synchronised front-end settings (8 km/hour).

"We are measuring the yield from the treatments in four-row plots as well as sampling the trash blanket, which is added to the mill yield to give an indication of the total biomass before harvest," Stuart said.

"We will then follow this over the next three to four years to look at differences between the plots.

"As part of the trial, we also pick sub-plots of rows where we count the stalks and inspect for damage, to look for things that have been cut, or bent, or had multiple cuts, or come out of the ground."

Stuart said there was enthusiasm from the trial collaborators and some early positive indications. Full information will be communicated to industry as the project progresses over the coming years.

"The three regions have different conditions. Here at Condong the crop is more erect, so the focus has been on the basecutters as opposed to the spirals, but when we move into more lodged trials in the Burdekin then that will see us assess the impact of the speed of the front-end more."

Stuart said that the project had already learnt valuable information about the front-end of modern Case and John Deere harvesters.

"Both need very different control systems due to the big differences in hydraulic systems between the machines.

"Aftermarket modifications on two of the machines have created some challenges, however working around these problems has greatly increased the understanding of the harvester hydraulic and control systems," he said.

QUT is continuing with the process of developing the detailed model of the behaviour of cane as it interacts with the front end of the machine, and is also continuing the process of engaging a PhD student to be involved in the project.



**Australian Government**  
**Department of Agriculture and Water Resources**

*This project is supported by funding from SRA and the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program.*

**For more information**

**Stuart Norris**

[stuart@schlot.com.au](mailto:stuart@schlot.com.au)

Grower Mark North assessing stools after the modified harvester has been over along with harvester driver Matthew Catteral.

