

CTF Sugarcane – Implementing Innovation

Gerry Deguara

Mackay, Qld 4740

Today I would like to share with you our journey to a controlled traffic system in sugarcane. Myself and Barbara and two sons Sam and Joe farm 300 ha at North Eton, approximately 36 kms west of Mackay. In partnership with my brother Tom we also farm another block at Oakdale, approximately 55 Kms west of Mackay, where we cultivate 300 ha, with the balance of the 1950 ha grazing cattle. Probably the main driver for the change was the wet harvest we experienced in 1998 where machinery with 10 tonne axle loads at 1.9 m spacings were driving on 1.5 m rows, damaging cane stools and compacting 70 – 80 % of the entire field. Our initial preference was for a 3 m system harvesting 2 rows at a time, as David Cox does. The problem was there was no commercial harvester available. A decision was made to go to a 2 m system with 2 rows of cane on a bed at 800 mm spacing. It was important that all tyres and tracks were no more than 500 mm wide to achieve with guidance on 25 % of the field compacted.

People say that I am too obsessed with this level of accuracy; but I firmly believe that, in sugar cane, zero till will not be achieved without it. Initially beds were formed with marker arms, but with the help of State Development, an RTK 2 cm guidance system was purchased and the dream of having permanent beds was becoming a reality.

When we joined John Hughes and Tony Crowley's Independent Ag Resources Group, monoculture was shown once again to cause massive soil health problems. A decision was made to stop the practice of plough out and replant and use the fallow period to grow legumes. Initially soybeans only were grown, planted in December and harvested in May. An 11 ha trial was undertaken in 2005, direct drilling chickpeas into soybean stubble. After a four month growing period, these were harvested and cane was direct drilled in early October. Remarkably, the crop still produced 108 t/ha and three years down the track it still looks healthier than the soybean-only fallow. This year we have 26 ha of chickpeas in flower now which will become our normal practice.

Reducing input costs, although difficult, is necessary to stay viable. The move to a legume fallow system has reduced chemical nitrogen requirements by 40% over a 5 year period. The higher density rows have eliminated the need for a grass spraying program in the rations, with residual chemicals only used in plant cane. Shielded sprayers are used in legumes and cane where necessary. The move to harvesting 2 m rows as opposed to 1.5 m rows has reduced harvesting costs significantly, with 30% less travelling and turning required; which, on a 100,000 tonne harvesting group, means a saving of 1800 kms of travelling for a 20 T harvester, which is significant.

Traditionally, legume crops have been ploughed back into the soil, but after purchasing a header, modifications were made to set the wheels at 2 m centres and for the last 4 years all crops have been harvested and sold. The initial crops were treated as bonus income but now they form part of our long term income. The next step is to grow a more diverse range of crops including fibre crops, peanuts and anything else that will let us achieve our long term goal of a 2 year fallow without losing income.

Zero till planting is practised in all our cropping, including cane. There are some challenging issues with the cane, but the benefits easily outweigh any shortcomings. I think the biggest challenge is establishing an even legume crop in a green cane trash blanket. Much good work is being done and hopefully improved planting technology will be available by the time our GPS guided beds become fallow in 2 years.

Harvesting has probably been the biggest challenge, but to me is the most interesting. After our first planting on the 2 m beds, I was approached by Chris Sarich from the BSES to join the 'Back on Track' group. As I had already committed to modifying a harvester, Mackay Sugar made funding available in return for harvesting trials on 5 farms. Although successful, the level of modification was

too high and a second machine was modified. State Development provided some funding for the modification and a system to make RTK guidance operate on a tracked harvester. This harvester worked well but when our group size went to 100,000 tonnes, a new John Deere harvester was purchased and modified. The modification involved removing the whole front end of the harvester, including the base cutter box, which actually cuts the cane at ground level. EHS manufacturing fabricated a new box. After the whole front was widened, a new track dead axle was fitted and the machine was ready to go. This machine is performing to the stage where the modifications are gaining the attention of major harvester manufacturers. The hauls out wheels have all been set at 2 m centres. SRDC funding has been made available to make the trailer wheels steer independently of the tractor to minimise the damage on the ends. This has reduced the compaction on the ends by 75 %. Next year we hope to have 2 units similar to a maxihaul reverse filling with GPS to eliminate the need for turning at every end.

As mentioned, 1 year from now our GPS guided beds will become fallow. Achieving uniform strike in our legumes is essential as, without them, our system is missing its main part. Hopefully, planting technology will allow this to happen. After visiting many zero till grain growers, one thing we all share is a change in attitude as to how we view a job well done in the field. From once admiring a clean well cultivated field, I personally take pride in establishing a crop in the stubble of the last crop and hopefully the crop before that. If the income from the fallow period can be maximised, a 2 year fallow will be adopted. The application of mill mud has been under scrutiny for some time due to the high application rates. Over the past three months we have constructed an applicator to apply mill mud at the rate of between 10 – 50 T/Ha. The mud is a by-product of the milling process and is high in phosphorus. The applicator is also being used for composted cow manure at 5 T/Ha. Hopefully many other products will be used in the machine. 50 % funding has been made available for this applicator through the sustainable landscapes program. All N and K are applied as LOS dunder, a by-product of the distillery at Sarina. Our applicator has been modified to use variable rate technology.

A strategy of applying fertilizers and soil conditioners only on beds will reduce nutrient runoff. Our target over a 2 year fallow and a 4 year cane cycle is to reduce our chemical nitrogen usage by 50%; chemical phosphorous usage by 80% and residual chemicals by 60% - which I feel is achievable.

Zero till has been promoted as best management practice, but cannot work independently. Only when a precise controlled traffic system and soil health program are fully implemented can zero till be considered a successful option.

Our family hopes to continue growing cane, complementary crops, run cattle, and contract harvest sugar cane in the long term. Our system has only been possible since 2 cm GPS guidance has become affordable.