

*Leading Edge, supported by the Society for Engineering in Agriculture and the Australian Centre for Precision Agriculture, provides a local and worldwide window on engineering and PA research.*

## Five into one goes with RigGuide

By Gary Alcorn

Precision agriculture advanced another vital step recently when Queensland-based business AgGuide launched its RigGuide system.

Rig Guide takes the proven, high accuracy two cm tractor steering technology of RowGuide and applies it to any implement which uses a sliding hitch or steerable mechanism.

According to AgGuide sales manager Alan Fetherstonhaugh, RowGuide will replace five bed re-forming operations with just one pass.

"The original idea came from St George farming contractor Royce Cox who transferred his tractor-mounted two cm GPS RowGuide package to an Excel Guess Row Averager (GRA) implement to enable him to straighten wobbly furrows without having to rebuild the entire paddock.

"Instead of ploughing down, cross ripping, re-levelling and then hilling up to cor-

rect wobbles in furrow layouts, RigGuide uses GPS guidance to correct these faults.

"The saving in time, money and maintenance could be as much as \$110 per hour while the environment wins through lower fuel consumption and the government wins through reduced fuel rebate payments," he said.

As with previous guidance systems, National Centre for Engineering in Agriculture (NCEA) engineers pioneered and refined the concept of hands-free driving and guidance while commercial companies such as AgGuide developed and field tested the hardware packages (see Jason Stone's box story).

In this case Toowoomba-based Excel Agriculture designed and built the GRA implement used by Royce.

RigGuide combines proven GPS dual frequency position fixing with improved software and electric/hydraulic linkages to

instantly adjust ground tools to match electronic paddock maps without requiring operator input.

Extensive field tests have shown RigGuide can straighten rows and even change layouts without having to flatten and reconfigure the entire paddock, Alan Fetherstonhaugh said.

"It enables growers or contractors to remake 40 inch rows to one metre or 30 inch rows which means this technology can apply to the cotton, sugar cane, broadacre grains and horticultural industries," he said.

Since then, field days at Goondiwindi and Warren have impressed NSW cotton growers including Auscott fleet manager Bob Bell.

"The way RigGuide performed was pretty damn impressive," he said "While we have been using tractor guidance in some form for about six years, this is a new concept.



Any steerable or sliding hitch implement such as this Excel Agriculture Guess Row Averager fitted with Rig Guide GPS guidance system can perform precise irrigation furrow realignment in one pass.

"There is certainly a place for it in precision farming," he said.

As more specialist machinery is designed to handle specific tasks, rigs that can perform bed renovation quickly and economically will have a bright future.

"In some operations you need to guide the tractor; in others you need to guide the rig — now we can do both.

"Auscott has been negotiating with Excel Agriculture on the possibility of building a 12 row GRA fitted with RigGuide technology. At this stage draft plans have been developed for review," Bob said.

North of the border, Goondiwindi-based farming contractor Paddy Ryan successfully adapted guidance technology to steer both his tractor and GRA toolbar — rationalising the process of re-forming raised beds and listing into one operation.

The innovation has set a precedent for environmental management in reducing fuel consumption and carbon emissions from raised bed management practices and is saving his farmer clients around \$100 per hectare.

Paddy no longer needs to pull down beds rendered unworkable by driver error as implements veer off-line, cutting into hilled sides and producing crooked rows.

"When you add the cost of listing of around \$25–\$30 per hectare to the cost of conventionally setting up beds, it's a fairly substantial saving to farmers.

"As for my business it will enable me to do the job better and faster, providing the opportunity to expand the service to other farmers," he said

He contract plants 4050 hectares of summer crop in the Goondiwindi, North Star, Toobeah and Yelarbon areas annually and provides a shielded spraying, cotton mulching and root cutting service to farmers, which provides another 6100 hectares of contracting work for his business.

One client, John Norman, Kalanga, Toobeah is impressed with the results and cost savings on a trial paddock treatment.

"Paddy used RigGuide on 422 hectares of permanent beds which really needed some straightening. In one pass he cultivated and restored the beds to their original layout.

"I can see us including fertiliser application with this service every couple of years prior to our contractors introducing guidance systems permanently on their tractors as accuracy and support improves.

"Also if we had a problem or stayed with manual steering we would get Paddy to lay gas and keep rows where they should be for minimal extra expenditure," he said.

John will be keeping a close watch on any crop yield reduction caused by compaction effects from permanent tramlines. He was a confirmed ripping advocate to avoid compaction but concedes that, late in the fallow, this practice releases a lot of vital soil moisture for no nett gain "under the right agronomic circumstances."

"I'm hopeful that the permanent beds realigned by RigGuide will be the answer so we can avoid both these moisture losses and associated inefficiencies," he said.

AgGuide general manager John Chalmers says up to 40 per cent of broad-acre furrow irrigation farmers rely on visual guess row marker arms with their inherent errors.

"Now contractors and growers can use say FurrowGuide or RowGuide on their tractors and RigGuide on their implements to realign their paddocks.

"This can be a 'once in several years event' with FurrowGuide preserving the corrected furrow layout for all subsequent operations including gassing, planting and weed control."

AgGuide plans to introduce US and Canadian farmers to this latest Australian innovation this month.

## Australian Society for Engineering in Agriculture

The society contributes to the development of a strong engineering involvement in agriculture to aid economic growth and environmental sustainability for the entire Australian community.

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For further information visit the Ag Guide website [www.agguide.com.au](http://www.agguide.com.au)

Excel Machinery [www.excelagr.com.au](http://www.excelagr.com.au)



## Engineering contribution to RigGuide

Australia's long history of progressive collaboration between innovative farmers and agricultural engineers has continued with the release of RigGuide.

When St George (Queensland) farming contractor Royce Cox purchased a RowGuide 2cm GPS guidance system for his tractor, he immediately began thinking of ways to use the tractor-mounted system to directly steer his Excel Guess Row Averager.

This initial idea led agricultural engineering consultant Jason Stone based at the National Centre of Engineering in Agriculture (NCEA) to adapt the existing RowGuide system to suit the specific requirements of steerable implements by writing new algorithms.

According to Jason, "NCEA has been at the forefront of tractor and implement guidance systems development for several years. Staff and students have come up with some very clever ideas, and a few of these have been taken up by commercial manufacturers."

This adaptation of technology to better suit the needs of the farm sector has been a core goal of the NCEA, based at the University of Southern Queensland in Toowoomba, as well as its commercial partner and manufacturer of the RigGuide and RowGuide products, AgGuide Pty Ltd.

Over the past decade, NCEA has researched and developed vision guidance, furrow guidance and GPS guidance systems for different tractors, harvesters and implements.

Today NCEA technology is contained within several well-known commercial guidance systems including the flexible range of AgGuide products, which use high accuracy single or dual frequency GPS receivers and CANBUS cabling for simplified tractor installations.

"The saving in time, fuel, machinery wear and tear, and soil compaction with RigGuide is remarkable. It's a win for smart engineering and the environment, and allows farmers and contractors to achieve maximum value from their investment in precision farming," Jason said.

