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LEADING EDGE

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.

Versatile new planter setup

By Peter Barr

Australian agricultural engineers, researchers and technicians can produce some awesome solutions when confronted by a challenge. In this case Pioneer Hi-Bred Australia Trials Officer Max Offner approached Vanderfield Pty Ltd last October with a proposal to build a special planter for Pioneer's summer and winter crop trials program.

Max said Pioneer Central Queensland Product Development Manager Andrew Farquharson had been thinking about developing a specialist planter for company trial work for more than three years

For the past seven years Pioneer had been using a 76 cm row space Mason planter for trial work, Max said. He has been involved with the Pioneer trials program since July 2000.

"It did the job very well, but the time came to develop a new model to cope with the changing row configurations, and to speed up the trials program.

"We're finding a lot of farmers are going to wider row configurations to give themselves a better chance of crop success. The whole idea is to be able to plant product advancement trials and show farmers how to best use Pioneer products to improve their gross margins," he said.

According to Andrew Farquharson, 1.5 metre rows have proved to be the most viable configuration for sorghum in Central Queensland, and wider rows were now being used consistently in northern NSW and the western Downs.

On the other hand there is a preference for narrow row spacings in the more reliable production areas, such as North Star, Liverpool Plains and the Inner Darling Downs.

"We wanted a planter we could set up to plant and fertilise any crop in a single pass on multiples of 500 mm spacings.

"Multiples of 500 mm suit our boomsprays which are set up on 500 mm nozzle spacings. As we get more into GPS technology we can put a band just over the top of the row in 1.5 metre and two metre rows, rather than broadcast. This is a much more efficient method of applying insecticide and herbicide," he said.

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Max Offner with the trials planter built by Vanderfield to a Pioneer design. Vanderfield's Michael Buck said, "You can't buy the configuration that Pioneer required from John Deere but John Deere has the parts and Vanderfield's service department has the expertise to make it happen."

UNR interest

Vanderfield's Michael Buck said the development of the Pioneer trials planter could be of particular interest to cotton farmers wishing to adopt ultra-narrow row spacings. "The challenge with standard precision planters is being able to go narrow enough," Michael Buck explained. "What we have shown with the Pioneer design is that it's possible to modify a planter to suit a range of planting options, starting from 250mm or 10 inches."

Each row unit is fitted with conservation furrowers, a Tru-Vee double disc opener with gauge wheels, a disc closing press wheel system, pre-emergent band sprays, tyne tooth harrows and a 1.6 bushel seed hopper with vacuum seed metering.

To accommodate narrow row spacings on the Pioneer planter, the transmission and gauge wheel assemblies had to be re-positioned outside the planting units.

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"The other real advantage of 500mm multiples is they fit most controlled traffic situations, allowing us to make fertiliser more accessible to the plant. In the past we've had issues about getting a return on investment when applying fertiliser before planting. Being able to put down seed and fertiliser in the one pass is more efficient and much more economical," Andrew said.

Max said ultra-narrow rows were being used in the US to plant corn, "We have to have the potential to do likewise here for corn, wheat and canola in particular. The wider rows are more for sorghum, which is being planted in more marginal areas in conjunction with zero till.

"With the wider rows you don't always achieve a top end yield. The aim is to guarantee a crop and be as profitable as possible year in, year out," he said.

NEW PLANTER DESIGN

Early this year Andrew and Max calculated the number of different row spacings they could achieve on a toolbar with a five metre width restriction. The width could be no more than five metres for transport purposes, so the planter could be moved by truck, together with a tractor and front mounted seeder, without the need for an escort and 'wide load' sign.

Other criteria were:

• The planter design required a standard and an offset implement hitch;

• The marker arm had to have four different settings while a disc closing system had to be incorporated; and,

• A lock-up kit was required on each planting unit to close it down when not in use.

It also needed conservation furrowers, a herbicide spray nozzle and finger harrows and it had to be capable of planting in seven different configurations — two metres, 1.5 metres, one metre double and single skip, standard one metre, 500 mm and, using the offset implement hitch, 250 mm.

Andrew said he talked to many farmers in Central Queensland about which planting systems could give all the configurations they needed.

"For planting trials, our need for versatility can be quite different to that of farmers. There are many systems on the market but we agreed John Deere planters have shown they will operate efficiently in a wide range of soil types, and on flat and undulating country," he said.

NEW PLANTER CONSTRUCTION

Glen Moriarty, who is one of Vanderfield's most experienced service technicians, explains the modifications.

"What we've done is use components from a standard John Deere 1700 Maxemerge Plus planter to develop the seven row Pioneer model.

Vanderfield's Glen Moriarty said the disc closing press wheel system on the Pioneer planter is a John Deere option, not normally used in most row crop applications.

"We started by cutting down a regular eight row bar to 4.9 metres, then worked out where to position all the components on the bar. To remain within the five metre width, and achieve 500 mm planting unit spacing, the gauge wheels and transmission had to be mounted outside the row units

"Also the marker arms, normally at the end of the bar, had to be re-positioned at the front of the bar. Finally the vacuum air manifold had to be shortened and modified to fit the row units," he said.

Glen said a regular planter did not normally have a unit in the centre of the bar.

"In this case, we need a unit in the middle to meet Pioneer's planting requirements. And the disc closing press wheel system on the Pioneer planter is a John Deere option, not normally used in most row crop applications.

"Throughout the two-week building process, we maintained close contact with Max at Pioneer. Some minor changes were made to the original design, but overall the composite parts came together very nicely," he said.

The planter will be used to establish around 100 trial sites per year over Queensland and northern NSW, and will operate in conjunction with a new John Deere 6410 ROPS tractor and a front-mounted Simplicity seeder. Pioneer now has the flexibility to plant corn, sorghum, sunflower, wheat, lucerne and oats in almost any configuration to demonstrate how farmers can best use Pioneer products to improve their gross margins.

***Peter Barr is Advertising and Promotions Manager at Vanderfield Pty Ltd, Toowoomba.**

In the next issue of Leading Edge, a SEAg member will comment on ultra-narrow rows and associated engineering challenges.