

Precision Agriculture in the paddock – grower experience

Shane Beil, 'Kilcummin Station'

Kilcummin, Queensland

Farming Area: 3800 hectares (ha) cropping and 7300ha in total.

Crops: Sorghum and sunflower in summer and wheat and chickpea in winter, using an opportunity cropping approach. In recent years there has been mung beans planted.

What changes have been made?

Originally Shane was using an 18m Flexicoil chisel plough that was converted into a planter. This has since been replaced with a Toowoomba Engineering 24m Groundbreaker with John Deere precision boxes that use Precision Planting drive equipment.



Figure 1: John Deere precision boxes with Precision Planting drive equipment. Each box holds 2 bags of sorghum seed. Photo: Shane Beil.

The need to increase productivity and planting efficiency throughout dry years was the primary reason for purchasing the new planter as planting windows were small. As well as this, placing seed in the available moisture was an issue with the old planter so improving the accuracy of planting depth was another consideration.

The Groundbreaker is used to plant all crops with, however, only sorghum, sunflower and corn are planted using the precision boxes which are filled by hand. The spacings can be changed by lifting up or leaving down rows of tynes.

'It's a 3 bar machine with 16 tynes on the back and 32 tynes on the next two rows. When I plant sorghum I just lift the front two rows up using a hydraulic lever which allows me to plant with 16 rows on meter and a half spacings. Then when I plant wheat and chickpea I leave all rows down which makes it half meter spacings,' describes Shane.

Benefits

The biggest benefit seen since investing in a precision planter has been the savings made in seed. In their 750ha sorghum crop last year, Shane managed to save 40ha of seed due to no overlap on his point rows or headlands. This was a saving of \$2/ha. Due to the dry conditions this was a relatively small crop, where normally 6-7000 acres of sorghum is planted. Using the precision planter under this circumstance can save \$12,000-14,000 in cost of seed. This will make a significant contribution to the payback period for the planter.

Another reason Shane decided on the Groundbreaker was because it doesn't require a high horse-powered tractor to pull it.

'The manufacturer recommends 450-500 horsepower, however, I use a John Deere 8345R which has 345 horse power and I have had no issues. For me this was a big win as I didn't have to invest in a new tractor to pull my planter.'

The Groundbreaker also has superior ground following ability compared to the previous planter and has rubber press wheels. Supersoft presswheels are used for sorghum and small v presswheels for everything else. This has eliminated problems associated with air loss in press wheels.

‘The tyne depth and press wheel pressure can be adjusted hydraulically, ensuring consistent seed placement in optimal moisture.’

This results in more uniform crop maturity and improves reliability of seed emergence. There can also be issues with tyne planters planting too deep in soft soils, however, Shane says that he is yet to have any issues going too deep yet can still go deep enough in harder soils.



Figure 2: Precision planted sorghum using Toowoomba Engineering Groundbreaker. Photo: Shane Beil.

‘This has been particularly helpful on sprayer and planter tracks that are more compacted. As a result, the seed is placed deeper which can access moisture further down.’

The Groundbreaker also operates at 24ha/hr compared to 18ha/hr using the adapted Flexicoil planter.

‘This has improved planting efficiency without the cost of planting at lower accuracy, placing each seed 190mm apart,’ says Shane.

The Groundbreaker cost \$380,000 where payback period is estimated to be around 5 years, depending on the season. Since using the Groundbreaker Shane has seen better yields as there is no double planting due to

individual row shut off. As a result, plants have less competition for soil resources such as moisture.

The Groundbreaker is also used to apply liquid fertiliser using a John Deere rate controller which is run through the tractor monitor. This allows Shane to apply fertiliser whilst planting by selecting the amount of liquid he wants to apply and the controller applies it at an exact rate. It is primarily used to apply trace elements but has been used to put in phosphorus at 250mm deep. The planter also has the ability to double shoot fertiliser as it has an extra fertiliser boot.

The planter can also be fitted with an independent front mounted coulter which can cut through stubble, assisting in uniform seed placement.

Issues

So far there have been no issues, however, there were some teething issues when first using the machine with the hydraulic rams, however, this has now been resolved.

Future opportunities

Currently Shane has liquid tanks for his fertiliser on the frame of the planter. He is hoping to upgrade to a bigger air-seeder that has a separate tank that he can run his fertiliser through so he can remove the tanks off the planter frame.

Recommendations

‘I recommend purchasing a planter that suits the environment you are operating in. In particular, for my situation I have found having a 3 bar machine instead of a 2 bar has reduced maintenance and improved planting depth going over contours,’ says Shane.

‘The Groundbreaker enables me to plant into moisture and is a versatile machine. I can modify depth settings to suit the requirements of each of my paddocks.’