

Precision Agriculture in the paddock – grower experience

Mark Wagner, 'Durham Park'

Orion, QLD

Farming area: Mark and his father Paul farm 4,800 hectares (ha) across three properties.

Crops: Sorghum and mungbeans in summer and wheat and chickpea in winter when opportunity arises. Recently they have planted corn as an additional option during summer.

What changes have been made?

The Wagner's have been using a John Deere 4730 self-propelled 24m boom spray with a 3000L tank for both fallow and in-crop sprays.

When spraying their paddocks, Mark and Paul were concerned about how much chemical was being wasted by spraying the bare ground and not just the weeds.

Because of this they began looking at the WeediT and Weedseeker spot spraying technology.

'We already had two self-propelled sprayers and didn't want a third machine, so it was important to us to be able to get the technology retro-fitted to our existing machines,' says Mark.

After researching and consulting with suppliers they had their John Deere 4730 retrofitted with Trimble Weedseeker 2 red light cameras by AgSpray in Goondiwindi.

'There are various ways of retrofitting the technology and it's important to get it fit to suit what you already have. Our cameras have been fitted using quick-release stainless steel brackets with hoses that cam lock and have push electrical connectors. We had the cameras hooked into the pressure line so that they are completely different to the existing plumbing. This way when we are not spot spraying we can take the cameras off for in-crop sprays or blanket sprays,' describes Mark.



Figure 1: The Wagner's 24m John Deere 4730 with Weedseeker 2 cameras retrofitted. Photo: Mark Wagner.

Benefits

The Weedseeker 2 technology has enabled the Wagner's to target weeds when they are small and has reduced chemical wastage by not constantly blanket spraying.

'As we have only recently completed the retrofit, we have only used it once. However, over the 1050ha covered, only 26.7ha was sprayed which is 2.5% of the paddock,' says Mark.

By using the Weedseeker technology the Wagner's have saved approximately \$11.50/ha. Another benefit is that the Weedseeker kills all weeds it targets, which means not having weeds at different growth stages throughout the paddock.

Each nozzle is controlled by a camera, meaning on Mark's sprayer each camera is 0.5m apart and are 700-800mm off the ground. As the boom is 25m there are extra nozzles on each end so there is some overlap. As well as this, the cameras face straight down which reduces issues with shading. Not only this, but the Weedseeker cameras stay on when they go above 2m off the ground whereas other cameras turn off.

'This was important when selecting the technology as the height control is to do with the spray rig so by having the cameras stay on we are not missing any weeds. We also have bump stop wheels on the boom which help to keep it level at all times,' says Mark.

'The suspended boom works great and so far there have been no issues with the boom cracking. We didn't want a trailing boom because when it's dry the paddocks are very rough and damage to the boom is likely. We can also spray at around 17-18km/hr but as it is a self-propelled we can travel faster when not using the cameras'



Figure 2: Weedseeker 2 cameras fitted with quick release stainless steel brackets. Photo: AgSpray.

One of the biggest benefits for the Wagner's were the savings in cost. Retrofitting the Weedseeker 2 technology cost them \$150,000. If they bought a trailing boom they would have had to modify it to fit on their 4m centres. As well as this, they would have had to buy a new tractor to pull it, invest in front wheel assist and then put it on 4m centres. By retrofitting they have saved a tremendous amount of money.

The system is also capable of automatic turn compensation which adjusts spray pressure when making a turn so that no overlap occurs in sections that have already been sprayed. Newer machines allow you to have both the John Deere and Trimble monitors fitted so that GPS can be used.

However, the Wagner's have older monitors and their capacity is somewhat limited. They run the cameras through the John Deere monitor, meaning they cannot use GPS whilst using the cameras. Hence the sprayer is unable to use GreenStar to control the steering at this stage.

Issues

'There were some teething issues, specifically with the pressure line. We originally used a two-way tap to supply pressure to the cameras but this caused the pressure to be supplied to the cameras instead of the nozzles. This was swapped for a t-piece which directed pressure to both,' says Mark.

There have also been some issues with auto calibrating meaning you have to pull up and do another calibration and sometimes the nozzles stop working, however, this is no different to a normal spray.

'It has also been difficult to determine how much chemical to fill the tank with as the cameras use so much less than a blanket spray. However, it just takes some getting used to.'

Future opportunities

'Next we are thinking of retrofitting our second self-propelled to further improve the efficiency of our business,' says Mark. 'If we do this then we will also look at upgrading our screens to newer models so that we can incorporate the automatic turn compensation which will save us even more chemical.'

They are also thinking of introducing different chemicals.

'Some of our soils are light and Feather Top Rhodes grass gets away, and wild sunflower and Mexican poppy are becoming more important to control before they become real issues.'

Recommendations

Mark highly recommends retro-fitting the technology to pre-existing machinery.

'Why have two machines when you can have one machine that does two jobs. Yes, taking the cameras off and on takes about an hour but it's no different to going through and changing your nozzles or checking them for blockages,' says Mark.