

## Selective spray units help war on weeds

KATHERINE MAITLAND



JOCK MCNEILL'S WEEDIT MACHINE IN ACTION AT DUSK.

Selective weed spraying units such as the WEEDit and the WeedSeeker are proving effective for two Riverland farmers.

The WEEDit machine is a Dutch-designed selective weed-spraying unit that uses a combination of sensors and solenoid

drivers. The WeedSeeker uses opto-electric technology to detect plant chlorophyll and trigger herbicide application.

Both units provide accurate and fast weed-detecting technology that allows chemical to be targeted to weeds without affecting surrounding areas.

According to Jason Freiberg from Agtronics Australia, the Australian wholesaler for WEEDit, the Dutch machine uses red light technology to detect the chlorophyll in weeds and sends and triggers the spray nozzles to release herbicide onto the weeds.

“The WEEDit unit comes equipped with a full diagnostic screen, allowing for continual monitoring of the system, and can be used at speeds up to 25 kph,” he said. “The system operates from true ground speed and calibrates automatically as ground colours change.”

“Sensors are located at metre intervals so weight on the boom is minimised. Each sensor controls five nozzles and the machine can spray strips only 20 cm wide. It’s also capable of targeting much smaller weeds than our competitors.”

Kevin Bradley, Service and Operations Manager at Crop Optics Australia, manufacturers and wholesalers of the WeedSeeker in Australia, says the WeedSeeker uses high-accuracy sensors, spaced 38 cms apart, which deliver greater resolution and accuracy in heavy stubble.

“The WeedSeeker can be fixed to existing spray booms,” Kevin said. “We have



THIS IMAGE LEAVES NO DOUBT ABOUT THE 'SPOT SPRAY' NATURE OF THIS TECHNOLOGY.



TOP AND ABOVE: WEEDIT SENSOR UNITS ON A SPRAY BOOM.



ABOVE: A WEEDSEEKER UNIT HARD AT WORK.  
RIGHT: A VIEW OF THE SENSORS MOUNTED  
ALONG A WEEDSEEKER BOOM.



found our broadacre farmers are reducing herbicide usage, saving money and time, and combating herbicide resistance.

“The WeedSeeker is relatively easy to install. On a 24-metre boom, 64 sensors are installed at 380 mm spacing and connected to a daisy cable, which runs from sensor to sensor,” Kevin said.

When comparing the WEEDit to the WeedSeeker, the WEEDit machine has one sensor per five nozzles, whereas the WeedSeeker has one sensor per nozzle. However, the WEEDit is claimed to target smaller weeds. Prices of both machines vary with the individual application, from \$100,000 to \$200,000.

### Savings

Riverland farmer Jock McNeil bought a WEEDit spraying unit in late 2009 to reduce chemical costs on his 7,800 ha farm at Paruna.

“The number one reason we purchased the machine was to cut chemical costs,” he said.

“Previously we let more than 5,000 ha go to pasture, which created a huge weed seed bank of all species and we could simply not afford to clean paddocks up

with repetitive blanket sprays.”

“Since we have been using the WEEDit technology we are not only saving on chemical but are seeing very positive results in the paddock.

“The efficiency of the machine has allowed us to spray up to 500 ha with one 5,000 L fill, which has saved a lot of filling time. In terms of productivity it is close to what I spray with our Nitro sprayer even though the boom on the WEEDit machine is only 30 m and we operate at 20 to 22 kph in most conditions. The Nitro has a 36 m boom and we run it at an average of 28 kph and up to 32 kph in the right conditions.

“At a 10% coverage rate with the WEEDit I am able to spray 500 ha on one fill. This works extremely well in our

situation because we generally spray on summer nights, starting at midnight and working through until the early hours of the morning. In cooler conditions and with suitable Delta T ranges it’s an eight and a half hour shift without stopping,” he said.

Using the WEEDit machine means he can afford to use tank mixes of more expensive chemicals because he is applying much less chemical.

“With a water rate of 100 L/ha and coarse droplets the plants are smothered with chemical. This is a huge benefit when evaporation levels are high or the weeds are already stressed and not actively growing, resulting in them being harder to kill from the start.

“Applying 40 to 50% more water has

increased the spray quality, compared to the 50 to 60 L/ha we were using when blanket spraying.”

According to Jock the WEEDit is an easy unit to use, with options to target smaller weeds where necessary.

“Basically, you turn the supply pump on with enough flow to keep up if the WEEDit is in a flush mode. You set the air regulation valve on the boom, three bar for my water rate and ground speed, then it’s all controlled by an on/off master switch. The hardest decision is when to spray if there are weeds still breaking the surface.

“The ideal weed size for detection would be the size of a coke can but it will also hit broadleaves as small as a 50 cent piece in the mid row. In my experience it is better to target small weeds at night because there no shadows from the stubble.”

He says the WEEDit has enabled him to control problem weeds such as fleabane, skeleton weed and Rhodes grass.

“In a blanket spray situation it is extremely expensive to control and eradicate these weeds on a large scale,” he said. “This normally results in skimping with lower rates that don’t do the job properly and probably just cause resistance in years to come.

“Now we use the Nitro and the WEEDit for pre-seeding weed control, with trifluralin in the 5,000 L tank on the Nitro and a knock-down tank mix in the 800 L tank on the WEEDit. If the trifluralin is applied with a water rate of 60 L/ha and the tank mix at 100 L/ha and the WEEDit finds and sprays emerged weeds on only 10% of the total area they will both run out at the same time.

Jock says he has tested the WEEDit in all types of scenarios and soil conditions.

“We had one paddock that was full of weeds and it looked like a definite blanket spray job but I decided to see if the WEEDit could handle the density. The results came out at with a 34% coverage, which I was very surprised to see that low, considering how dirty the paddock was.”

The WEEDit technology has saved him time and money, with most of the savings from reduced chemical use.

“The biggest savings we have recorded are up to 92% in chemical costs with the average about 85 to 90%.

“In one paddock the WEEDit found



JOCK MCNEIL IN A CANOLA CROP IN FULL FLOWER.

weeds on only 8% of the paddock, which was a huge saving compared with blanket spraying, but with weed numbers reducing and the past two summers being extremely wet, I’m hoping I can get even more savings in drier summers to come.”

While Jock is pleased with the performance of the WEEDit machine, there are still a few issues he would like to iron out.

“The WEEDit is not a 100% weed control machine in one pass. It’s more like 90 to 95% due to very small weeds at the base of the previous crop’s furrow, but in our situation we are committed to a minimum of three sprays and are constantly reducing numbers each pass.

“Navigating around the monitor is not straight forward either. The software is difficult at the start, but with a few years under my belt now, I am more confident. There is room for improvement on some of the hardware, too, such as solenoid bodies and the Ramsey valve that controls the pressure.

“Surprisingly, not a lot of solenoids have given me grief. The biggest fear is they are not firing, but with general cleaning boom flushes and checking it is no different to getting blocked nozzles on any other sprayer. The monitor warns the driver if a camera is not working.

“Weeds with a thin vertical leaf, like small self-sown cereals or summer grasses, are harder to detect and the results on them can be disappointing. You might hit one summer grass plant directly and miss one the same size 10 metres away. We

achieve better results on this type of weed at night.”

Tall stubble can interfere with the detection of smaller weeds.

“Taller stubble heights, more than 30 cm, can interfere with the detection of small weeds by blocking the beam. However, a lens upgrade on the machine and a change to 380 mm row spacing has reduced this issue.”

Jock says he would recommend the WEEDit to other farmers on savings alone.

“It has its pros and cons like any machine. It wasn’t smooth sailing for the first few years and we were constantly modifying camera height, nozzle height, timing and coverage settings to get the best out of the machine, but we were the guinea pigs of the technology, so it was expected. These problems have now been eradicated in the later model.

“The WEEDit is not the answer for every farm or even every paddock, but it is an excellent tool and another option that can enable you to achieve weed control outcomes that wouldn’t be possible with blanket spraying purely because of the chemical costs.

“I am gaining more confidence in the machine each year and it is definitely the way of the future. For farmers who have been spraying summer weeds for five years or more without much improvement it is a no brainer because I know how low our weed population is getting after three years of no seed set.

"I would like to think that, in one or two years' time, I won't need to do any blanket spraying over summer. The only reason we are still under the pump is because of the way we used to farm, which built up a huge summer weed seed burden.

"The chemical savings are very rewarding alongside the moisture and nutrient conservation. Intensive summer spraying and use of the WEEDit have allowed us to improve gross margins and yields beyond our belief in this low-rainfall environment.

"I can only see the technology improving and think weed detecting technology will be used in many different operations in years to come. I know that on our own farm we could not afford to be farming the way we are without the WEEDit."

Sensor technologies like WEEDit and WeedSeeker effectively turn boom sprays into spot sprayers, which has the potential to reduce chemical costs by thousands of dollars.

A typical tank mix 'brew' for summer spraying with the WEEDit or similar machine is:

2 L/ha Surpass 475	\$8.40
2 L/ha Glyphosate 450	\$7.00
100 mL/ha Garlon	\$1.50
1% ammonium sulphate	\$0.40
500 mL Infiltrator/100 L water	\$1.35
Total	\$18.65/ha

For blanket spraying Jock reduces rates to reduce costs, along the lines of 1.5 L/ha Surpass, 1.5 L/ha glyphosate, 80 mL/ha Garlon, plus ammonium sulphate and Infiltrator adjuvant; which would cost \$14.50/ha.

Based on those mixtures, a single blanket spray over all of his 7,800 ha would cost

\$113,100, which aggregates to \$339,300 for the three summer sprays he applies most years, but he can get the same or better weed control by spraying only a few per cent of the property with a stronger, more costly, mixture.

Using his best coverage result, in which the WEEDit found weeds on only 8% of the paddock area, Jock calculates the chemical cost of using the WEEDit to spray his property with a 'brew' like the one above at \$11,638, or \$34,914 for three sprays; a saving of \$304,386 a season in chemical costs alone.

Even with high weed populations resulting in the WEEDit spraying 15% of the total area the savings are huge compared to blanket spraying; a total of \$273,840 over three sprays on his property.

### Leaner years

Matt Hall, who farms with his father Doug on his 3,500 ha property at Wunkar is using a WeedSeeker weed detector unit.

After viewing a segment on *ABC's Landline* and speaking to farmers already using the machine, Matt decided to buy a WeedSeeker in December 2007.

"I was interested in the infra red technology and benefits of the spray unit," he said. "The WeedSeeker was being used in the horticultural industry at the time but was not so common for broad-acre cropping.

"We wanted to help control our summer weed situation, mainly melons and couch grass. We have marginal rainfall on sandy clay loam, and if we get summer rain we have to be tight on our summer weeds.

"Since buying the WeedSeeker four years ago we have seen great results with our weed management program. We have also seen huge savings on chemical costs. The

machine has really helped through the leaner years.

"Our application rate depends on the year, but on average the area we spray is about 18% over the 3,500 ha. The beauty of the WeedSeeker is that we are hitting the weeds at optimum time and using a lower application rate."

According to NTech Industries, which manufactures the WeedSeeker technology it saves time, labour and chemical, reduces environmental impact and can operate day or night.


The patented technology uses advanced optics and computer circuitry to find weeds. The unit does not spray bare ground, and detects the weeds only.

"The WeedSeeker is a direct and effective way to kill weeds," Matt said. "It's also very easy to use. We like to walk into the stubble, check to see if there are weeds underneath and then adjust for the height of the stubble. You then turn on the machine, let it warm up and turn on the calibre button. The tank on our Goldacres sprayer holds about 4,000 L of spray mix so we have minimal stoppages for refilling, which saves time too.

"Last year we didn't use the machine a great deal as it was a wet summer and blanket spraying seemed a better option. In the dry years, we have seen fantastic results on weeds such as fleabane.

"The WeedSeeker does require a bit of water; how much depends on the chemical balance. We still use a blanket spray where necessary but overall we are really happy with the machine."

For more information on the WEEDit contact Jason Freiberg - 07 4671 4715.

For more information on the WeedSeeker visit [www.ntechindustries.com](http://www.ntechindustries.com). 

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