

False start no-tiller now an advocate

SARAH JOHNSON

When drought struck in 2002, Mallee cropper Andrew Cass knew he could no longer stall the move to no-till farming.

The Paruna-based farmer of 40 years, who was cropping up to 5,500 ha of mostly sandy loam soils at that stage, had long considered a no-till operation and attempted one season with an adapted Hesston seeder bar in 1997.

That first no-till venture involved removing alternate tines on his seeder bar, creating a row spacing of 355 mm to provide for trash clearance, replacing the remaining tines with Ryan tines, which had a higher breakout pressure, and fitting Harrington knife points and press wheels.

He broke even with his rye crops that year, but suffered a considerable loss with barley. Given that experience he returned to conventional farming, not prepared to continue with no-till until there was more expertise and support in his district.

“We didn’t do a very good job controlling the weeds, so we lost a significant amount of money from our barley crop,” said Andrew.

“We couldn’t financially withstand the mistakes we were likely to make if we continued down that line so we decided to pull away from it until there was a bit more no-till knowledge and support available.”

It wasn’t until the run of dry seasons in the new century that Andrew reconsidered his farming system and management of his 6,300 ha property.

“In the 2002 drought we only had about 50 millimetres of rain in the growing season. We lost a lot of topsoil and realised that we had to change our system,” he said. “That year really showed what lack of moisture can do and how devastating a drought can be to the soil.”

After completing the 2003 seeding program Andrew embarked on a no-till research trip, travelling to farms in Ouyen, in Victoria, and to Eyre Peninsula to talk to farmers using disc seeders and tined machinery to work out the best no-till equipment for Mallee conditions.

The main issues he considered were



ANDREW CASS'S CONSERVA PAK SEEDER IN ACTION.

repairs and maintenance, control of the soil fungus rhizoctonia and soil throw for trifluralin incorporation. He had doubts about the effectiveness of a disc seeder in all of these areas.

“I thought discs would be fairly high-maintenance, would the bearings, and I didn’t know whether they would handle rhizoctonia. I also learnt that tines were very good at covering trifluralin,” he said.

Andrew purchased a new Conserva Pak CP5112 seeder bar for the 2004 season. The machine, which he is still using eight years later, has knife points on 300 mm row spacings and 50 millimetre-wide dedicated press wheels.

Unlike his first foray into no-till, the purchase of this dedicated no-till seeder meant there was no going back to conventional farming.

“It was virtually a dedicated no-till machine, so I couldn’t turn around and suddenly go back to the conventional way,” said Andrew. “I was forced to burn some bridges, which was a good thing.”

Good support from the local Conserva Pak agent, Ian Keller at Kelbro Machinery, and from the Conserva Pak team in Canada, boosted Andrew’s confidence during set up and for the first seeding program.

“Ian was very good at assisting me in the early days and Conserva Pak even sent a representative from Canada to help us set up the machine and get it working in the paddock. We went into seeding with a great deal of confidence that it was going to do the job for us.”

Andrew is impressed with several features on the Conserva Pak bar, including its simplicity and the accurate placement of seed and fertilisers that minimises the risk of fertiliser burn.

“It is a very simple system, with very few working parts in it,” he said. “The press wheel determines the depth of the seed, which is not only positioned above the fertiliser, but also slightly to the side. The seed actually lands onto a firm seed bed and to the side of the knife-point furrow, where the fertiliser is deposited. There’s no risk of the seed falling into the fertiliser.”

And with the press wheels each attached to a tine assembly, rather than having a gang of press wheels on one shaft, they are able to work independently, reducing the risk of stones or hard ground affecting performance across the bar.

The seeder has also met Andrew’s expectations for low maintenance, although one issue he encountered early



THE CASS TEAM - ANDREW CASS (CENTRE), WITH STAFF MEMBER KELVIN EBERT (LEFT) AND OPERATIONS MANAGER 'JUNIOR' SCHULTZ (RIGHT).

was a lack of grease in the wheel bearings. "We had two wheel bearings collapse as the result of bearings drying out," he said. "We solved that and haven't had any problems since." He also ensures the knife points are repaired with new tungsten tips every second or third season.

The machine required one modification to ensure weed material didn't block the air flow in the fertiliser tubes. Andrew employed a local engineer to fit winged fertiliser boots either side of the outlet tubes, which sit behind the knife points. The boots are flat steel sheets welded onto the sides of the tubes, creating a clear space that prevents trash clogging the tube ends and allowing air to freely carry the fertiliser. "The air flow in the fertiliser tubes was being cut off by trash wrapping around the tine and blocking underneath the tube. That stopped air coming out, so fertiliser built up in the heads further up the air lines. Every time we went to fill up we found five to 10 blocked rows."

The seeding rig is powered by a 425 horsepower 9430T John Deere Track series tractor, which replaced an 8879 model two years ago. The 9430T provides better traction on the sand hills.

Andrew has also upgraded to a triple-box John Deere air cart with variable rate technology he uses to adjust seed and fertiliser rates according to soil type. He believes the variable rate capability has been a valuable innovation for his farming operation.

"We've been able to vary the rates of fertiliser – phosphorous and nitrogen – as well as seed density on the different soil types," he said.

Most of Andrew's soils are sandy loams, with some heavier, red sandy-loam flats and light sand hills. There are good soil phosphorous levels across the farm but Andrew has found they don't always translate to crop yield, especially from crops sown in heavier, restricting soils. The variable rate technology has allowed him to reduce the amount of phosphorous applied on the heavy flats and increase the rate on the farm's mid slopes where the crops respond well to the extra phosphorous.

"The variable rate machine allows us to place more phosphorous on the areas that give us better responses," he said.

"Overall we've been able to reduce our

phosphorous inputs quite a lot. Standard practice has been to put 10 units of phosphorous over the whole farm. With variable rate we are probably averaging five or six units, so we've saved 40 to 50 per cent on our phosphorous bill."

But he is using more nitrogen now than he was a few years ago as his crop rotation no longer includes a medic-dominant pasture, which used to provide an organic source of nitrogen.

Until 2007 Andrew used a fixed rotation of two years of crop followed by one year of medic-dominant pasture. But that changed when he engaging an agronomist. "We've taken on agronomy advice, so my strict rotational system has been challenged and changed." He now grows wheat for two or three years, then barley, wheat again, then rye ahead of a fallow. It is a change he regrets at times, due to difficulties controlling rhizoctonia.

The first major outbreak of rhizoctonia on Andrew's property occurred in 2006, his third year using the Conserva Pak seeder. "We were baffled why we had so much bad rhizoctonia, although we weren't the only ones with it. It was endemic in the region."

The only paddock that didn't suffer was one he had cultivated because it was newly-purchased property and very rough. "We hardly had any rhizoctonia problems in that paddock and it was the highest-yielding crop that year," he said.

"When we saw the rhizoctonia damage over the rest of the property it dented our confidence in no-till. We were looking at a five bag (1 t/ha) crop on the pre-cultivated paddock, whereas the rest of our land yielded a three bag (600 kg/ha) crop on average."

Andrew's agronomist suggested that poor control of summer weeds and medics probably contributed to the problem. "The medics got going pretty quickly after a break in the season and we were behind the eight ball in terms of controlling them," Andrew said.

"The idea that medics were part of the problem was very challenging for me, because I have always wanted to grow medics to fix nitrogen. I'm starting to think that again now, because in the past two years we've produced lower-protein wheat. That has taken us out of the premium hard wheat market, which is financially devastating."

A broken knife point led to a significant discovery in 2006, the second year of no-till seeding. The broken point was replaced with a spare that was 15 mm or so longer than the others and the plants sown in that row were noticeably stronger than the rest of the crop. "You could pick the better crop in those rows by thicker



A TINE ASSEMBLY ON THE SEEDER BEFORE ADDITION OF THE WINGED FERTILISER BOOTS ANDREW HAD FITTED TO PREVENT TRASH WRAPPING AROUND THE POINT AND BLOCKING THE TUBE.

straw, longer heads and it was probably also a little higher," said Andrew.

"The visual difference in the row sown with the longer time was consistent across all of our wheat, barley and rye crops and evident during harvest. It was unbelievable that you could sit on the harvesting machine and always pick the row, just by visual appearance.

"That proved to me that we needed to be spot on with our knife point depths and be very careful about keeping the points in good condition, especially if there was rhizoctonia present."

Andrew is also paying closer attention to summer weed control. "We used to wait until after harvest before spraying the weeds but now we make it a priority to have someone available for summer weed spraying, which begins soon after harvesting is underway.

This new regime means a second spray is needed if there are summer rains after a paddock has been sprayed. "You've got to turn around and spray it again and that becomes very expensive."

Andrew invested in a Nitro self-propelled sprayer ahead of the 2008 harvest. The new machine replaced two tow-behind spray plants, which tied up two tractors and two operators. "It wasn't difficult to work out the cost benefit of the self-propelled sprayer," he said.

The change released the tractors for use in the harvest operation and having a self-contained sprayer allows the operator to focus entirely on achieving the best weed control.

Keeping weeds in check is a vital part of Andrew's moisture-saving strategy within his no-till operation. He has noticed improved moisture savings during summer due to stubble retention and the absence of cultivation. "Any rain we get goes into the furrows, and because we're not cultivating we're not exposing the soil to moisture loss."

He has also seen improved soil health, which has widened the sowing window.

"The soil structure is so much better. The



A VIGOROUS, EVEN CROP IN FULL HEAD; THE PAY OFF FROM A ROBUST NO-TILL SYSTEM THAT IS WORKING WELL.

AT RIGHT (LEFT TO RIGHT): A SIDE VIEW OF ONE OF THE WINGED FERTILISER BOOTS DEVELOPED TO REDUCE TRASH BLOCKAGES AND IMPROVE FERTILISER FLOW; A CLOSE UP OF A TINE FITTED WITH A WINGED FERTILISER BOOT; A REAR VIEW OF ONE OF THE WINGED FERTILISER BOOTS FITTED TO THE FERTILISER TUBES ON ANDREW CASS'S CONSERVA PAK SEEDER.



paddocks aren't blowing away and the fences aren't getting drifted in," he said. "There's a lot more organic matter on the soil surface. Some years, you can actually see two lots of stubble on the ground, from the two most recent harvests.

"We also have flexibility with the timing of sowing. It doesn't matter if you sow a bit later sometimes. In fact, it seems a bit odd, but some of our best crops have been sown later.

"If we were on a conventional system, the window of opportunity for sowing would be limited, because the later you sow a crop, the slower it gets away and the more prone it is to drift. With no-till, stubble cover makes all the difference."

Stubble management hasn't caused issues for Andrew, except in 2010, when he burnt stubble for the first time since changing to no-till. The stubble was left longer than usual because that season's crops were particularly tall and bulky and rain during harvest meant there was more pressure to get the harvest off as quickly as possible.

He was reluctant to burn but felt he had little option, and the moisture stored as a result of the summer rainfall enabled him to sow reasonably early last season.

Andrew has considered changing to a disc seeder but fears that, without knife points to shatter the soil, rhizoctonia could become an even bigger problem. Whether or not a disc machine would provide enough soil throw to cover trifluralin is also a concern.

"Knife points work reasonably well, but with a disc seeder is that we could

perhaps leave the stubble standing higher and still sow directly into it," he said.

"Standing stubble would probably improve moisture conservation, because wind removes moisture from the soil and allows the soil temperature to vary a lot more.

"I think it has been underestimated how much damage wind causes in reducing crop vigour and increasing evaporation from the soil.

"You could probably use a disc seeder to dry sow prior to an opening break as long as you have an extremely well-managed and rigorous weed control program. Given that we've got financial constraints and as farmers we don't always do things as well as we could, I think it could be quite a risk."

Andrew's advice to farmers considering a

no-till system is: 'just do it'.

"There are enough farmers in all areas doing no-till now that mistakes can be minimised by taking notice of the lessons learnt by the early adopters.

"Plus the management is so much easier in terms of fuel consumption and machinery costs. We're not wearing out tractors any more.

"Once established in a farm's management system, no-till is the solid foundation for further developments like variable rate application and the introduction of new crop types.

"I think no-till is ideal if you want to try to grow different crops like canola, chick peas and lupins. There is even potential to grow summer crops without the risk of erosion."

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