Mixed farms taking advantage of zero till

SARAH JOHNSON

Using a disc seeder to sow summer forage crops can have many benefits for farmers with livestock, says disc seeding contractor Nathan Craig.

SEEDING CONTRACTOR NATHAN CRAIG WITH HIS EXCEL SINGLE DISC SEEDER, WHICH PERFORMS WELL IN CROPPING AND PASTURE ESTABLISHMENT.

Disc seeders give farmers the flexibility to move between crops and pastures with very little disturbance, according to Nathan Craig.

"I can see there are advantages to having livestock and cropping together. The disc seeder gives you a lot more options because it doesn't disrupt the soil and you can over-sow to boost production," said Nathan, a Victorian farmer and seeding contractor.

Since the Craig family sold their 1,465 ha farm, near Apsley, across the border from Naracoorte, in 2009, Nathan has developed a contracting business that sows up to 5,000 ha each year. Many of his clients successfully combine livestock and cropping.

Nathan uses a disc seeder that provides good seed placement and germination in 'crab-hole' country, improves the ability of young crops to access to soil moisture and opens the way for planting summer crops to provide extra feed for stock.

The Craigs were experimenting with summer crops for several years before they sold their property and bought a disc seeder the year before they sold.

"Even though it was dry during the 2000s we were starting to double crop and grew some really good summer crops," said Nathan.

"With a disc seeder you can just go straight in behind the header because you don't have to worry about handling the stubble. You can bowl straight through.

"If you get rain during harvest you can sow sorghum into harvested paddocks while you're waiting for the remaining crops to dry enough to harvest. Ten weeks later, in March or April, you've got green feed for your sheep, right when you need it."

This was exactly what he did on a property he was managing in 2010, when 73 mm of rain fell while Nathan was harvesting canola.

"The header was still in the paddock and we had a few days ahead of us waiting for the country to dry out. We sowed the harvested canola paddocks to sorghum.

"We used sorghum because the root systems go up to a metre deep and you can sow it up to 50 mm deep, which improves the chance of achieving a reliable germination.

"By the time we finished harvesting that block of land we had sorghum out of the ground. It wasn't a fantastic-looking crop because that was the only rainfall we had that summer, but we still had sorghum 60 cm high to put the lambs on in autumn.

"Other farmers didn't get a summer crop because they waited four or five days after

the rain and the soil had dried off too much.

"In an area where the canola was washed out in winter the sorghum was 2.5 m tall because of the extra soil moisture, which showed it would be possible to grow some pretty amazing summer forage crops if we were prepared to treat them as the main crop rather than an opportunity crop. This made us think more about how to use this in rotation and to feed livestock. We've never had this response in summer grain crops."

For summer forage opportunity crops Nathan advocates a speedy transition from header to seeder following a harvest rain to make use of the available moisture.

"I would either have half a tonne of seed on hand, especially if I saw a rain coming, or I'd make sure the supplier had a bit of sorghum seed with my name on it," he said.

"I'd have everything set up and would be out sowing while the sappy moisture was still there.

"If our sandy loam got 25 mm of rain it would wet the soil to 30 cm but that moisture evaporates unless we grow something with it. It is critical to know how your soils wet up, as every paddock is different. No-till paddocks are definitely better for double cropping as they let more moisture deeper into the soil."

He found planting sorghum as a summer crop also conditioned the soil, leading to increased yields from wheat crops the following season.

"From what I've seen, if you grow a sorghum crop then go into wheat the next year you'll get three quarters of a tonne to the hectare higher yield," he said.

"Even though the summer crop takes moisture out, there's a synergistic effect that helps grow a better crop.

"Over summer the sorghum roots penetrate about a metre through the heavy clay. The paddock where I sowed the sorghum in 2010 had a duplex soil; 30 cm of lighter sand on top and 30 cm of heavy clay below that.

"Water doesn't get through the clay very quickly, so we had a lot of waterlogging in the top 30 cm. The sorghum used that moisture to germinate then pushed its roots through the clay layer to access moisture from the subsoil. The roots of the following wheat crop followed the path of the sorghum and lived on the nutrients and moisture that they left behind.

"From what I've seen, if you grow a sorghum crop then go into wheat the next year you'll get three quarters of a tonne to the hectare higher yield,"

"This was before we had the disc seeder and the results blew me away. I thought 'we've got to do this properly with a disc seeder'. The disc seeder allows you to retain more moisture for the summer crops because you can seed into the stubble with almost no soil disturbance."

He has since found that adding millet to a sorghum crop improves weed control.

In the wet summer of 2011 he sowed a mixture of millet and sorghum that grew more than two metres tall and produced about 3 t/ha of grain. The crop was harvested in mid April and he sowed the paddock to wheat the next day.

"The rest of the farm had two summer sprays – a knock-down and a pre-emergence spray – to prepare for wheat. We sowed straight into the millet and sorghum paddock, which had stubble a metre high and no summer weed, wire weed or ryegrass.

"The tall summer crop shaded the ground and out-competed the summer weeds. The millet roots bound the soil up so there was no room for more weed roots.

"It was an out-of-control paddock the year before, full of ryegrass, which is why we sprayed it out and planted the summer crop. It was nearly clean after the sorghum and millet.

"Some ryegrass came up in the wheat crop and we went in eight weeks later with a post-emergence herbicide, just because I wanted to tidy it up. That was the only weed control for that paddock for the whole year.

"I spent $50/ha on chemical for the rest of the farm trying to keep it clean."

The roots of the millet and sorghum also improved trafficability.

"A lot of our country was waterlogged because of the wet summer that year and I had to stop sowing the rest of the farm because I was leaving awful, deep tracks and nearly getting bogged. In fact I nearly got bogged on the sand hills driving across to the millet and sorghum paddock, but once I got into that paddock, I only needed two-wheel drive and had zero wheel slip.

"The soil was full of millet and sorghum roots, which were holding the soil together.

"It was a real eye opener to get down in that paddock, where I would normally have got bogged in those conditions, and find the soil had the strength to support the machinery due to the root structure."

"No-till paddocks are definitely better for double cropping as they let more moisture deeper into the soil."

TRANSITION TO ZERO-TILL

Until the mid 1990s the Craig family cropped only about 10% of their farm.

The rest of the property, near Apsley, in Victoria, was under pasture that supported a sheep enterprise producing meat and wool.

But that balance changed in 1995 when the family decided to use cropping as part of a program to renovate pastures and control onion grass, which was limiting stock production.

They used conventional, full-disturbance cultivation to prepare seed beds for summer crops of rape and safflower but the topsoil blew away and establishment – and production – was poor.

They also found that their conventional seeding machinery, with what Nathan Craig describes as a 'traditional undercarriage', struggled to handle stubble. "If there were two sticks in the paddock it would block up," he said.

Based on their 1995 experience they decided to convert to a no-till system and in 1996 invested in an International combine they had a local engineer set up with higher breakout tines on 254 mm spacing and press wheels.

The International had better stubble-handling capabilities than their previous machine, allowing the Craigs to avoid burning legume stubble, but still didn't cope well with stubble from heavy cereal crops. Efforts to address this included fitting residue deflectors and sowing in dewy morning conditions rather than in the afternoon when the stubble dried out and balled up in front of the seeder.

Despite those limitations the change to no-till was generally positive, Nathan said.

"Our summer and winter crops improved out of sight due to better seed placement and seed to soil contact. It was then I realised that all could be won or lost at seeding.

"The pastures sown with our no-till seeder were also exceptional, showing us what can be achieved with properly sown pastures."

In the late 1990s their rotation was a rape-based summer crop followed by wheat before the paddock was sown back to pasture. This was designed to eradicate onion grass, which causes problems with soil nutrition, pasture production and stock health.

They used Group B chemicals, which are effective in reducing onion grass, in the summer and winter crops so the paddock was clean for the pasture; a combination of sub clover, balansa clover and perennial rye grass.

"This approach was purely designed for weed control to set the paddock up for a good pasture. We doubled our stocking rate by renovating our paddocks," said Nathan.

The livestock operation suffered in the run of dry years at the turn of the century so they increased their cropping to 69% of the 1,465 ha property by 2006.

"The dry period worked against the high-input, intensive grazing system we had established our farming practices on. We could see that cropping could provide better margins in drier years due to cost control so we expanded the cropping at the expense of the sheep operation," said Nathan.

They also made changes to their machinery, buying a Shearer combine fitted with knife points and press wheels, a spray boom and liquid fertiliser assembly. In 2007 they also bought an air seeder.

They used this set-up for two seasons before also investing in zero-till machinery – a Linkage disc seeder set up on 381 mm spacing.

Their involvement in the Victorian No-Till Farmers' Association exposed them to the benefits of a zero-till system and a disc seeder also fitted well with their plans to experiment with summer crops because of its minimal soil disturbance.

They were also concerned experiencing some problems with the tine seeder, including poor seed placement and excessive soil throw; with large amounts of soil – and the trifluralin already applied to it - being thrown from the seed row into the inter-row, leaving the seed row largely unprotected.

By 2009 the drought had taken its toll on the Craigs' commitment to farming. The dry conditions weren't conducive to high stocking rates, and while they saw potential in cropping, almost 10 years of dry years left them disillusioned. They sold the farm, but Nathan retained the tine and disc seeders, starting a contract seeding business, Zero-till Farm Services, in 2009.

"I took the machinery, because growing crops is the part of farming that I enjoy the most," he said. "That's why I pay more attention to sowing machinery and the job that seeders do in general.

"We're looking to get back into farming in the next few years, but having a rest from it is probably the best thing we've ever done. It's given us time to collect our thoughts and work out what we really want to do and how to do it. I'm still learning.

"One of the gratifying things is that the year we exited farming, everything was coming together, particularly with our livestock. We had our production systems set up; we were probably closer than we thought. After we sold our livestock I heard reports that the lambing percentages were really high and they lambed in four weeks. That's what we'd been working on.

"That's given me confidence, because I now know exactly how to run my sheep and cropping enterprises."

Most of Nathan's contract clients were initially more comfortable with the tine seeder, with many of the properties not set up for the 381 mm row spacing of the disc seeder and many of the farmers seeing the wider rows as a disadvantage. He also found that the Linkage disc seeder wasn't well suited to navigating paddocks with a lot of trees; a common situation on farms in the South East.

He sold the Linkage machine in 2010 and replaced it with a nine-metre Excel single disc seeder. "The trailing machine gave a lot better ability to turn corners and negotiate trees," he said.

The Excel is set up on 254 mm spacing, a precedent set by other no-till contractors in the area. Nathan said this spacing system works well for sowing pastures, which make up 60% of his business.

"It was a safe bet to go to 254 mm spacing. Spacing of 304 mm is a bit wide for pastures but good for crops, while 177 or 203 mm is good for pastures but not as good for crops because of stubble-handling issues."

His contracting work has revealed the ability to handle chaff as an issue with disc seeding, he said.

"One of the biggest problems I've got as a seeding contractor is that the harvesters don't do a very good job of spreading the chaff. Often it's spread only a third of the width of the header front.

"In many paddocks we have to sow into chaff trails 5 cm thick and standing stubble with bare ground between in the one pass.

"If you sow canola 2 cm deep where there are 5 cm of chaff you're sowing the seed into chaff, not soil.

"Spreading chaff has always been an issue with harvesters. It's even more important than ever to get it right now with no-till and zero-till systems because it can really impact on crop establishment and ultimately yield."

Manage weeds for the best start to disc seeding

SARAH JOHNSON

Good weed management is the key to a successful start to disc seeding, according to South East farmer and cropping consultant Nick Hillier.

"Make sure your paddocks have a very low weed population. That's the secret to disc seeding," said Nick.

"Work out a crop rotation that is most suited to managing annual ryegrass and set up your paddocks four or five years in advance.

"It's important to reduce your ryegrass to an absolute minimal level, so your pre-emergent herbicide can manage it.

"If you don't do the lead-up work you'll probably have a fairly big failure in the first year.

"If you have your weed management right you'll find a disc machine will help maintain or decrease that weed seed problem."

This was the case on the Hillier farm,

NICK HILLIER AND HIS SONS CHARLIE AND EDDIE IN A ZERO-TILL CROP PADDOCK.