



The Loneragan family, beginning with Lee's grandfather, have been farming at Mungindi on the New South Wales/Queensland border for 50 or so years and initially stocked Merino sheep. They haven't always run the most progressive farming enterprise, but over the last 15 years they have aggressively developed their country and bought additional land. Now, they run a mixed farming enterprise on 11 000 acres of mostly heavy black soil. They stock Angus and Hereford cattle and crop between 8000 and 10 000 acres of cereals each year. Around 2000–4000 acres of this land will be in rotation, generally chickpeas and faba beans, depending on the market.

### *Why liquids?*

Lee was wary of moving to a liquid in-furrow system, but inconsistent results with urea and a desire to improve plant production and cost efficiency led him to research the systems and take the next step.

In past trials on his farm, urea application had failed to show clear, consistent results. He could grow an 18-20 bags per acre crop after rotation with no urea, while a neighbouring crop would only yield 12 bags per acre or less when 100 kilograms of urea was applied, despite similar paddock history characteristics. He had also seen magnificent, lush wheat crops that looked great in the paddock when he used urea but then been disappointed by grain size and yield. As nitrogen is one of the largest inputs on his farm, Lee wanted to get it right.

While others were trying to improve germination through buying high volume pumps and injecting water into the soil or redesigning better press wheels or points, Lee thought that liquids could hold the answer to increasing germination and yield. He had always loved the principle of liquids in-furrow and it made sense that liquid nutrients placed near the seed should be more easily taken up by the growing plant to enhance root development and overall plant production.

"People often ask me, why did we go liquid? To me it's always the dollar factor, but I also got sick of buying inferior products."

<b>Who:</b>	Lee Loneragan
<b>Where:</b>	Mungindi, NSW/QLD border
<b>What:</b>	cropping (cereals, chick peas, faba beans) and Angus and Hereford cattle
<b>Aims:</b>	improve plant growth to increase yield and support stock production
<b>Equipment:</b>	Liquid Systems (SA) G22 and Spiker modules and Stacker Distribution kit with Section Control.
<b>Outcomes:</b>	<ul style="list-style-type: none"> <li>• increased yield</li> <li>• decreased seeding rate and higher germination</li> <li>• improved grain fill in dry years</li> <li>• fewer nitrogen inputs and less risk</li> <li>• reduced product costs by six per cent through less delivery overlap</li> <li>• even product distribution and reliable results.</li> </ul>

### *Choosing a delivery system*

While Lee had been thinking about liquids for quite some time (more than 10 years), he spent three years rigorously researching liquids and delivery systems before making his decision. Lee spoke to Liquid Systems (SA) founder Peter Burgess who was able to provide Lee with a range of information and a list of people to talk to about their systems. Within three weeks the Loneragan family had purchased a Liquid Systems (SA) unit. Lee decided to use a Liquid Systems (SA) G22 dual liquid injection auto-rate system with a Stacker Distribution system, which meant he could apply two separate liquids at different rates. The system is compatible with a range of monitors so he could control and monitor application rates in the tractor cab from his Ag Leader Integra display. The Stacker Distribution unit was also configured with section control so that section nozzles automatically shut off when they passed over ground already covered. Lee matched this with a Spiker dosing system that had been designed to incorporate highly viscous fluids, like trace elements, fungicides and soil wetters, at very low rates into the main liquid delivery line.

"I knew once I started to go down this road it was a leap of faith. I have no regrets, it's been wonderful and I'm so glad that I contacted Peter from Liquid Systems. He's been a real source of information, which is what you need when you're trying to make a decision."

## Liquid Systems (SA) in Action - Applying fertilisers

Lee has now been using liquids and Liquid Systems (SA) machinery for two seasons. He's very happy with the UAN (urea-ammonium nitrate solution) in-furrow, one of his biggest inputs. Even in the tough 2013 season his crop didn't lose its colour or wilt until right at the end due to lack of moisture. While the plants suffered with lack of moisture, they had hardly any leaf foliage or flag leaf, all of the plant's energy went into the grain heads. It looked like an ordinary crop, but the yield was much higher than expected.

"It doesn't have to be the prettiest crop in the world as long as the returns and profits are there at the end of the year – that's what we're all pretty happy about."

While UAN is more expensive than urea, Lee doesn't need to apply as much nitrogen and at the same time he's reduced his risk. Lee had been applying 100-120 kg/acre of urea (46-50 nitrogen units) in January/February to make sure that it was available for plants to use in May. At this time the ground was hard and the machinery wear and tear costs were high. Applying urea four or five months before seeding was also a big gamble – often a \$300 000 outlay – as planting wasn't guaranteed. Now Lee applies just 20 units of nitrogen in the furrow and grows a much better crop. He's getting a better result with less and he's also reduced his risk as the fertiliser isn't applied until planting. His money stays in the bank until he's ready to plant and if he hits a dry season, he hasn't lost out.

Liquid Systems (SA) machinery delivers liquids at an incredibly accurate rate, so nitrogen distribution is consistent within the furrow to support even crop growth. Although nitrogen is their biggest fertiliser requirement, Lee has also seen some great results with micronutrient application using Liquid Systems. Yield increases of up to three per cent have been achieved in problem areas. In midst of a major drought, the Lonergans have allowed their stock to graze on the stubble which is not their normal practice. Lee has noticed his cattle preferentially grazing on areas where he's trialled micronutrients, across three properties. If plant nutrition is balanced, then it makes sense that the plants may be more nutritious for stock as well.

"I'm seeing tractors out in December with growers already starting to put fertiliser out on the country. They're taking a big chance. That's the side of liquids I love, there is much less risk involved plus delivery is incredibly accurate. I'm not spreading 20 kilograms over there and five kilograms over here – I'm getting an even distribution of nitrogen exactly where I need it."

The section control function within the Liquid Systems (SA) unit has also reduced Lee's product costs by about six percent. This shuts down sections of the Stacker Distribution system when they cross areas that have already been covered – particularly beneficial in irregular shaped paddocks. Lee has five sections in his current system and could increase that to ten to further reduce product wastage. Lee is saving substantial fertiliser with the auto-swathe and will save money on seed as well, when they incorporate swathe control on their seeder in the future.

"What we're doing is turning farming upside down – we're re-developing farming with liquids."

## Applying inoculants

One of the biggest differences that Lee has seen since his change to liquids has been in his rotation crops – faba bean and chickpeas. For years, it had been a struggle to coat the seed properly with the necessary inoculants. Lee had been mixing the inoculant into a slurry and spraying it into an auger running at a slower rate. It would coat the seed, but then it would harden and become gravelly on the outside. Much of the grain would split, chip, or crack during the process and germination rates would suffer. With only a 24-hour shelf life once applied to the seed, getting the inoculant right while

maintaining seed integrity is a challenge for most farmers and Lee was no exception. Most growers increase the seeding rate to compensate for lower germination rates, but Lee found that he could reduce his sowing rate by 10 per cent when injecting the inoculant in-furrow with his liquid system and his germination rate was higher than ever.

With seed costing approx \$450 per tonne, a 10 kilogram per acre reduction in seeding rate could save Lee about \$13 500 over his 3000 acres of rotation crops each year. This saving alone, without taking into account the increases in germination rate or yield, would quickly account for the cost of the Liquid Systems (SA) unit.

An added bonus for Lee was the increased shelf life of the inoculant. If for some reason he couldn't plant, then the tank of water mixed with inoculant could be stored for up to 48 hrs without losing any effectiveness - a quick agitation and it was ready to go again.

"I apply inoculant using the Liquid System at planting and not only am I coating the seed but I'm inoculating my ground as well. This gives the seed the most perfect little world to germinate in and it works remarkably well. I can't describe how happy I am about that part of the system – it just works so well."

## Challenges

Lee found some aspects of the switch to liquid products challenging and is still working to make the liquid storage, transport and tank filling as streamlined as possible. While this takes time and equipment, Lee is still happy to be using liquids rather than spreading urea as his main fertiliser. The prospect of buying or renting a spreader, employing a contractor, managing breakdowns and sowing time, bulk handling of product, running disc chains or harrows over his country and uncertain outcomes is enough to compensate for his teething issues.

During his first planting, the soil was dry and dusty on the surface but moist underneath and this initially

caused some problems. Dust was blocking the non-drip check valves and caused some leakage when the unit was pulled out of the ground. The Liquid Systems (SA) unit is designed to stop liquid delivery as soon as it comes out of the ground. Peter from Liquid Systems (SA) worked with Lee to design a solution to his problem and a new check valve 'boot' was born. This rubber covering prevents dust, dirt and mud from interfering with the check valve and solved the leakage problem.

It's a matter of having someone who can sit down and work with you to solve your problems. From Peter's point of view – he wants his product to be the best in the world and it probably is."

## The bottom line

Lee has been able to save money through reduced seed costs and product wastage, while consistently improving yield with less inputs and less risk, by using Liquid Systems (SA) equipment to distribute fertiliser and inoculants in-furrow.

There are certainly a few people looking over the fence at what the Lonergans are doing. Lee would tell you that he's not doing anything special; he's just applying good products a little bit smarter.

"If you have equipment in reasonable condition and it's reliable, then you can very easily attach a Liquid System to it. And you pretty much start to make more money from the day you do."

*Case Study written by Dr Angela Lush*

For more information contact Peter Burgess (08) 83574437