



# Fertigation here to stay

*Farming on extensive Otago land and getting the best out of it for animals is important to Otago sheep and beef farmer, Andrew Paterson. The introduction of fertigation has been a valuable asset for this purpose.*

Andrew and Tracy Paterson own and operate Matakau Station, which is home to 25,000 stock units. There are 19,000 sheep, made up of 10,000 breeding ewes, the rest being hoggets and wethers. 1,100 cattle reside at Matakau, 500 of which are breeding cows, and the rest are heifers, steers, and calves.

The hot, dry summers and cold winters meant irrigation was especially important to them, and they have been developing it since they took over the running of the property in 2004.

“We have to grow enough decent quality feed to support them (the sheep and cattle) through the winter, and we couldn’t do that as well as we do without irrigation.”

Originally 150 hectares (ha) was under border dyke and flood irrigation. Although it served its purpose, Mr Paterson said to become more efficient they decided to shift to spray irrigation. Spray guns were introduced in 2008 and the first centre pivot was installed in 2015. They now had 200ha under pivots, 240ha under spray and only 45ha remaining as border dyke.

When planning their pivot development, Mr Paterson talked with his cousin who had fertigation, and thought it would be a good option for them.

“My cousin had his system designed by Fertigation Systems. I contacted them and they came down and designed and installed the system. We then put it in and had a few teething problems at the start but have never looked back.”

They now had two pivots with one injection system running the fertigation through them. A 30,000 litre tank was used to hold the fertiliser solution. Ten tonnes of urea was delivered, by blower truck, and added to 20,000 litres of water.\* The solution is mixed in the tank. A high volume pump sucks from the bottom of the tank and then feeds back in halfway up the tank through three nozzles, to create a stirring action.

Mr Paterson said the mixture took two days to soften the urea before it was ready to mix, and then it is mixed for two 24-hour cycles. They could also put ten tonnes of ammonia sulphate through it. After that a Dosatron type pump (an electric dosing pump that injects the fertiliser



\*It is important to understand the properties of dry urea when added to water. The reaction is endothermic. This is a negative heat reaction. When urea is added to water the liquid becomes cold; you can feel the side of the tank get cold. Once the liquid becomes very cold the dissolving could stop. To drive the dissolving to completion it is necessary to have vigorous agitation, more liquid to dissolve into or heat.

*Andrew Paterson next to the tank where the fertigation solution is mixed.*



into the mainline) injected the concentrated solution into the irrigation water as it flows through the centre tower on the pivot.

Their irrigation water came from their own private water rights, and two community irrigation schemes, and was gravity-fed, meaning there was plenty of pressure.

Mr Paterson said the mixing system had caused them to go through a few pumps while trying to find the correct pump size, as they needed a pump that could handle the flow and the fertiliser solution.

Under the pivot they grew a perennial ryegrass and clover mix. The expansive nature of their land meant the paddocks were all subdivided into three to four hectare blocks which “made for a real nightmare for the spreader truck driver,” he said.

“Getting ten tonne of urea under the pivot made for a lot of driving and opening gates, whereas the fertigation system has allowed us to put a little bit on whenever we want, without having to accommodate a truck driving around. We can flick it on and off with a button. Every time we irrigate, we do not fertigate. We just do it as we need it. Early spring with urea, then ammonia sulphate late spring, and back to urea in the autumn.”

“We normally put 10kg urea/ha or 31L of mixed solution (4.6 units of nitrogen) per pass. For the first pass of the irrigation season, we usually double the rate. The ammonia sulphate is also at 10kg/ha or 28L of mixed solution (2 units of nitrogen and 2.2 units of sulphur) each pass. Total urea of 200kg/ha and up to 150kg/ha of ammonia sulphate per year.”

To install the system cost around \$20,000, and ongoing costs included electricity and minor maintenance. The system had now been in place for six years, and he said they had not seen any extra wear and tear due to the fertiliser.



*Fertigation meant fertilising was as easy as flicking a switch.*



*Making good feed for healthy animals was made a lot easier at Matakanui Station due to fertigation.*

“It’s backflushed at the end of every season so there’s no residual left behind, and because we aren’t fertigating every time we irrigate there isn’t fertiliser in the pivot all the time.”

Mr Paterson said they used less nitrogen with the fertigation, and it had saved them both cost and time, even though other parts of the farm still received fertiliser via truck.

“I operate it, other staff members operate it and are happy to push the button, and away it goes. It’s all recorded and up on the wall in the shed where the fertigation system is, so everyone knows what’s happening.”

It made proof of placement easy too, Mr Paterson said, as the pivot went to the exact same place every time.

“Although the pivot crosses over top of some troughs, we are fertigating at such a low rate of application, so it doesn’t worry us.”

He said the system had made a huge difference. “It guarantees us growth. You can see the grass growing behind the pivot. It’s always there and has allowed us to fatten out steers at 18 months, mate all our heifers, and winter our ewes and hoggets. There is always good feed, which makes healthy animals.”

Prior to farming Mr Paterson came from an accounting and science background, so he was not apprehensive about the idea of developing irrigation or adopting a new fertilising system.

“Going forward we will look to develop the system, improve the pumps, and continue to get the best out of our land for our animals, and look after the environment.”

Story originally published in *IrrigationNZ News*, Spring 2021 issue.