Farming with invisible fences

By Richard Rennie

A Waikato farm is one of the country's first commercial farms to use virtual fence technology, where fences disappear and cows guide themselves from paddock to the dairy.

Walking across Pete and Ann Morgan's Te Awamutu farm demands a double-take when looking at the fences in most paddocks – the posts are there, but the wire is gone, recently pulled out, never to return, and now replaced by the invisible wires of a virtual fence system.

Morgan has an almost child-like gleam in his eye, not often found in dairy farmers approaching their late 50s. It comes from discovering a new way to look at and run his farm and his two 300-cow herds. A way that, in his own words, has given him a new lease of life in this late-stage of what has already been a very successful dairying career.

It comes at a time when many of his peers may have stepped out of farming altogether, be it dulled by conventional dairying's repetition, the daunting challenges ahead or simply being physically broken by the job.

"I know that Ann and I would not be able to do another 20 years' farming the way we have been. The physical challenges and the big issues dairying faces that will drive big changes in how we run our farms," Pete says.

For the Morgans, that new way has come by adopting the Halter technology and is poised to turn conventional dairy systems on their head.

Morgan started following Halter founder Craig Piggott three years ago as he began developing a remote cow management system that could keep cows behind virtual GPS-defined "fences", and prompt them to move unshepherd by staff between paddocks, "breaks'' and the farm dairy at scheduled times.

The Morrinsville-born farmer's son Craig, who left Rocket Lab to pursue his tech vision, soon made a mark in Silicon Valley with an investor pitch that included a demonstration via laptop of him shifting his dad's cows back home in Morrinsville.

Pete Morgan is an early adopter of the Halter technology, which removes physical fences from the farm, and says the system has made the layout and management of his farm more fluid and flexible.

Halter's GPS collars signal to cows via sound prompts when they have left their break defined via GPS and an app-operated farm map. The sound cues nudge the cow back to her GPS-defined break.

Cows can have scheduled shifts programmed into their collars, including when to leave the paddock via an invisible gate and head up to the dairy for milking or a new break, all without dog, motorbike or staff intervention.

Halter Business development manager Steve Crowhurst says the collars had to overcome some big tech hurdles.

"There were three key ones. One was developing algorithms for individual cow guidance, a second was having robust, solar-powered collars that were comfortable and durable on a cow's neck, and the third was having communication ability, regardless of terrain, capable of transmitting to the cloud," Crowhurst says.

All dealt with today, the company has begun deploying onto commercial farms and is now getting strong enquiry from farmers.

For Pete, the tech's potential lay in helping him manage dairying's big challenges while protecting farm profitability.

"For us as a System 2 farm, it is all about optimising feed utilisation, without

compromising water quality and animal welfare, while addressing our future emissions," he says.

On a two-herd farm constrained by gullies, sidlings and a long 4km profile, achieving that optimum pasture use has always been challenging.

"You may have a paddock and know it's actually 10% bigger than what you need, but more often than not you will just go with it, given location, labour and time to allocate the exact amount is too difficult."

The new tech has enabled him to turn the entire 240ha farm into a blank slate, unconfined by anything other than raceways and farm dairy location.

On installation, the entire farm is mapped by high-definition drone and the imagery used as the farm map for defining the virtual breaks.

"As you adjust a break, it precisely allocates pasture on a dry matter per cow and square-metre per cow basis." he explains.

"You can allocate to a far more exact amount. It ultimately reflects in cow production and behaviour.

'They learn to trust you in terms of what you are offering them each day, their grazing behaviour changes and becomes more relaxed."

The Morgans are pulling out the fences on their farm, with wires gone and posts to go. They will ultimately have about 15 static blocks, rather than the original 60 paddocks.

Those blocks can be managed by any variable he chooses, including land contour, soil type and fertility, while proximity to wetland areas, waterways and sensitive land is considered. All breaks are capable of being easily readjusted on the Halter app.

Halter-equipped cows grazing on Pete and Anne Morgan's Pokuru farm. Both herds of 300 cows are now equipped with the remote farming collars, which give the cows a gentle nudge when it is time for them to move.

In the meantime, early morning round ups for milking are gone, thanks to a scheduling ability that will activate on the collars at a preset time, nudging the cows towards the dairy.

"So, by the time I get to the dairy at 5.00am, the last cow is coming into the yard and we can get straight into milking."

The farm motorbike has become redundant, and the calm vibe of the farm is enhanced with his preferred use of an electric mountain bike to get around the property.

Cows are scheduled to move from paddock to crop mid-morning to have their 4kg DM per head strip of turnips, and head back to graze the next break before afternoon milking.

His staff appreciate the transparency the Halter tech is bringing to a pasture-focused grazing system.

"Instead of me holding that grazing IP in my head, they can see for themselves why we are grazing the way we are, and they are very engaged, often suggesting great options to me," he says.

"This technology is something they get completely and really buy into. They will soon enough run further than me with it and I can 'see' what is going on."

With the farm's many gullies, ponds and wet areas, he can manage the sensitive waterways, adjusting grazing near them depending upon weather conditions, pushing closer when dry and well back in the wet.

But ultimately the tech is opening up his mind to looking at the farm more broadly and without the usual constraints fences impose.

"It's been a chance to be far more creative in our management, and I'm sure we will find more over time," he says.

"Often you become frustrated because you don't have the time or the tools to unlock that creativity, now we do."

Simple steps to remote farming

Pete and Ann Morgan are early Halter adopters, having had the system on one of their farm's herds for three months, and the other since mid-February.

Perhaps not surprisingly, transitioning the dairy herd from conventional practice to Halter is usually easier for the cows to get their heads around than it is for their owners.

Each Morgan herd of 300 cows took only five days to replace their usual sensory cues with the sounds and vibrations delivered via the Halter collars.

"The best way to think about the collars is the sound the cows get on each side of their head are like reins, guiding them along, with a vibe signal to encourage moving," Pete says.

In transition, the cues are superimposed over the cows' usual cues. For example, a feed break will continue to have a portable fence in front of them for a few days after collars are installed.

"And cows are used to sound cues – the sound of the farm bike, the tractor or the fence reel being wound up – you are really simply replacing one set of cues for another," he says.

"It's like they have a shepherd on their shoulder 24/7 encouraging when they are right, and guiding them when they go the wrong way."

The resulting shifts, either between breaks or to the dairy, slow down to the cows' natural pace.

With it lameness has fallen away, along with the very human frustration of trying to move hot cows on a summer's day from the back of the mob.

Longer-term Pete is excited about the collar's capacity for collecting data that can be used to help develop algorithms to manage behaviour, health and reproduction.

"To achieve the resilience dairying needs, as farmers we need to set a high bar for technology solutions, and Halter is meeting it," he says.

"You still need to be a good farmer, it's not that the system makes you a better one, it just gives you more tools, options and flexibility we have never had before."