Regenerative agriculture – opening up the wallet

Regenerative agriculture has potential as a selling point for our export markets, but how do the numbers stack up for farmers?

On-farm economics of regenerative agriculture

Why: To help people understand the financial implications of adopting regenerative farming practices.

Where: Sixteen regenerative and conventional sheep and beef farms, nationwide.

Who: Steven Howarth (AgFirst), Bill Garland (farmer), Alex Bromham (farmer), Phil Weir (AgFirst) and Katherine Tozer (AgResearch).

What:

- A desktop study compared the farm revenue of conventional and regenerative farms.
- There is reduced revenue on regenerative farms.
- Farm expenditure is similar for conventional and regenerative farming.

Read more: *On-farm economics of regenerative agriculture*: ourlandandwater.nz/RPF2022

Regenerative farming has captured people's attention globally over the last few years with the possibility it could be a model for farming in the future – easier on the environment and more sustainable.

Beef + Lamb New Zealand are also enthusiastic, seeing it as a potential selling point for our meat overseas and possibly fetching a premium. Robust science is needed, they say, to back up any claims and avoid greenwashing.

Pastoral farming is one of the fundamentals of regenerative farming practices. As our farming systems are pasture-based rather than using feedlots, as is common in the US, this puts New Zealand on a strong footing already and would make a transition to this type of farming easier for our farmers than for some others.

"There's a risk that if we don't have New Zealand-based data we fall back to overseas data that may not be relevant," agricultural consultant with AgFirst Steve Howarth says.

"While having independent data is important, so too is looking at regenerative agriculture with clear eyes and not over-hyping its benefits," he says. "We've seen that before – where there's been comparisons made between feedlot farming overseas and regenerative farming to portray the benefits. In a New Zealand context with our pasture-based farming that just isn't correct.

"Because there is so much interest in regenerative farming, and people who are interested are really passionate about it, it's important not to let this enthusiasm get in the way of objective data. Farmers need to see clearly what changes there would be with regenerative farming," he says.

In 2021, Steve was involved with a previous regenerative farming study, also funded by the Our Land and Water National Science Challenge via its Rural Professionals Fund. The study looked at whether there was any significant difference between meat quality from animals raised on regenerative beef farms and conventional beef farms.

If the meat of animals coming off regenerative farms was of superior quality, this could bolster the export vision for it.

Management practices between the farms were compared, along with the biodiversity of pasture species. Replacing synthetic fertiliser for other types of plant and soil nutrients on regenerative farms was one of the most obvious differences in management.

In the end, the type of pasture the animals were eating was similar, without a big difference in biodiversity and a similar number of pasture species. When the meat from animals raised on both types of farm was tested, there was little difference.

"While there was curiosity among the conventional farmers about regenerative practices, and they could see the regenerative farmers were clearly making a living from their farms, many were wary to even consider a move over to this system without seeing the economics first," Steve says.

For farmer Alex Bromham, who was involved with the trial, the focus on getting the most financially out of the land is not necessarily a key reason why regenerative farmers farm the way they do. The desire to improve the health of the soil, add biodiversity to pastures and reduce nutrient loss to the waterways is important. "Get that right and the financial side follows on from there," he says.

With funding from the Rural Professionals Fund, Steve led a team to see how regenerative sheep and beef farming were faring economically compared to conventional farms.

Gross revenue differences

A total of 16 regenerative and conventional sheep and beef farmers were surveyed to gather four financial years of revenue and expenses.

While there were different spending priorities and management approaches, with the condition of the farm seeing focused spending in certain areas, there were no significant differences in expenditure. It appeared that whether the farm was regenerative or conventional was not a driver of expenses.

But in the revenue stakes, the conventional farms in the study were bringing in more revenue per hectare of effective farmland. The total gross revenue for the conventional farms averaged $1,473/ha compared to $1,091/ha for the regenerative farm (**Table 1**).

To try and nail down how that difference came about, farm modelling software FARMAX was used to look at revenue differences for a single year across the farms.

The gross farm income from the conventional farms was $1,705/ha compared to $1,060/ha on the regenerative farms.

Table 1: Summary profit and loss data based on the 2017/18 to 2020/21 financial years for conventional and regenerative farms

	Conventional	Regenerative	P-value
Total gross revenue ($/ha)	1,473	1,091	0.022
Total farm expenses ($/ha)	1,017	1,085	No difference
EBITRm ($/ha)	613	273	0.050

The answer in part may come down to pasture. More pasture was being eaten on conventional farms, with 7.3 tonnes of dry matter/ha compared to 5.5 tonnes on the regenerative farms.

Secondly, more meat was being produced per hectare on the conventional farms. This amounted to 326 kg/ha compared to 201 kg/ha on the regenerative farms.

"The results held no surprises for Alex as regenerative farmers generally carry fewer stock anyway," Steve says. The aim is to carry as many stock as your land can support without pushing it to perform beyond its natural limits. This was also good business, he reckons.

The year under the microscope saw the gross farm income from the conventional farms was $1,705/ha compared to $1,060/ha on the regenerative farms.

Adding greenhouse gas (GHG) emissions to the mix saw some interesting results. Emissions per kilogram of meat from the conventional farms produced 16.3 kg CO_2e/kg of meat compared to 20.2 kg CO_2e/kg of meat on the regenerative farms. The conventional farms harvested a greater amount of pasture, which in theory would lead to higher total emissions per hectare. However, the current study did not find a significant difference, most likely due to the variability between farms.

In future, a larger study with more farms is required to understand how regenerative farming affects FARMAX modelling of GHG emissions. Future research could also study nitrogen loss on an area and productivity basis.

Price premium would encourage transition to regen ag

"We are seeing plenty of interest from the end consumer in regenerative agriculture," says Steve. "However, this project indicated that to provide a solid value proposition in regenerative farming for New Zealand sheep and beef, premium pricing is needed to offset the reduction in production.

"Currently there is no such premium through the major processors, which creates a barrier for conventional farmers given that financial performance is one piece of the puzzle for those considering the switch," he says.

The enthusiasm now is reminiscent of that surrounding organic farming 25 years ago, he reckons. Organic attracts a premium, and there is a good market for it which continues to grow, but there are real changes to farming practice that go with it and generally lower production.

For some farmers, there are other considerations that will make the change to regenerative practices worthwhile. The regenerative farmers involved in this project saw their farms as a functioning ecosystem, placing stock performance, soil health and biodiversity above economics. "All of the farms involved had goals for all these areas, and all were aiming to improve, it is just the relative priority of each that differed," says Steve.

Altering farm management systems and moving to regenerative farming practices may be easier here than for some countries. But the onus now falls on customers, who will need to pay more for what they see as a more sustainably produced product.

To expect them to do that will likely need some form of proof – and could well lead down the certification pathway or similar, as is the case with organics.

"When the rubber hits the road is, are people prepared to pay more for it?" asks Steve.

For his part, Alex wouldn't like to see regenerative farming go down the same route as organics with auditing and certification and input rules as it would impose restrictions on how they farm.

"We're not on a mission to convert everyone to regenerative, we just want to farm the way we do. People can look at it for themselves. If they want to try it, they should just crack on with it." he says.

Delwyn Dickey for the Our Land and Water National Science Challenge