

THE JOURNAL

The Official Publication of The New Zealand Institute of Primary Industry Management Incorporated



REGENERATIVE AGRICULTURE - DIFFERENT PERSPECTIVES REDUCING GHG EMISSIONS ON-FARM
ECONOMICS OF FERTILISER USE INTEGRATING MIGRANT DAIRY WORKERS INTO NZ **FARMER MENTAL HEALTH**



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COVER PHOTO

Highly diverse fodder
crop including sunflowers.
Photo courtesy Jono Frew

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Regenerative agriculture debate – where tribalism trumps pragmatism



It is with some trepidation that I dip my toe into the murky waters of the regenerative agriculture debate. As an interested observer from the sidelines, I have found the debate to be polarising and highly emotive, reducing our ability to rigorously interrogate regenerative agriculture practices to the extent that we should be.

Unfortunately, the diverging views around regenerative agriculture has manifested itself into those who support such practices and those who question its authenticity, with no quarter given between. Worryingly, this form of tribalism does represent an increasing trend in today's society where individuals seek to simplify things into easy binary terms of right or wrong, which limits their appetite to actively seek out and engage with more diverse perspectives.

This is further exacerbated through the influence of social media, unlimited access to information from the internet and sophisticated algorithms to direct news and media intake, and provides a platform for like-minded users to frame-up and reinforce a shared narrative within echo chambers. Unfortunately, this leads to a level of distrust of anybody operating outside of that chamber and a general reluctance to discuss other points of view.

There is no shortage of engaging and thought-provoking Youtube clips, media articles and information sources available on farmers applying regenerative agriculture practices within their farm systems. These are mostly internationally-based stories, and I can see how certain Youtube clips showing the transformation of farms in arid climates into productive fields is appealing. If this were a viral media campaign, I would say the advocates for regenerative agriculture have been phenomenally successful in promoting their farming practices and principles compared to more conventional-based farming systems.

As a relative newcomer to regenerative agriculture compared to the US and Australia, our farmers and others are trying to work out which practices work, and don't work, in New Zealand's temperate climate. This also needs to extend to determining what regenerative agriculture actually means within a New Zealand context. The muddling and varied interpretation of what regenerative agriculture practices looks like on-farm

has no doubt confused our ability to have reasonable broad-based discussions on the subject. This is further compounded by the rhetoric that regenerative agriculture is a continually evolving set of principles.

Even under the Primary Sector Council's *Fit for a Better World Strategy*, a different tack has been taken with regenerative agriculture being referred to as something we have always done. The Council notes that New Zealand has a 'long tradition of regenerative practices and principles including of enriching soil health, holistic management, balance, diversity, respect and connection with past and future generations.'

I expect there are large numbers of farmers who might already consider their farming practices to be regenerative, but don't choose to label these as such. Some of the outcomes being sought under regenerative agriculture practices (e.g. better soil health, increased macroinvertebrates, higher water retention, etc) would be the same types of outcomes that other farmers would also strive for. In fact, conventional-based farming enterprises may be closer to some of the principles of regenerative agriculture than is generally portrayed in the media and by various commentators on the subject.

A positive thing to come from the debate is the desire to test some purported benefits of regenerative agriculture practices on-farm. Currently, the Ministry for Primary Industries is calling for proposals for research projects to investigate regenerative farming practices in relation to New Zealand soils, climates and farming systems.

To help better inform and equip rural professionals when discussing regenerative agriculture practices with their farming clients, we have brought together a range of articles in this issue of *The Journal* to assess different standpoints on the subject. I encourage you to approach the subject with an open mind and actively interrogate the facts and claims being made. It is also important to analyse how you inform yourself in developing more diverse perspectives on regenerative agriculture practices, or for that matter any other new and developing areas within the primary industry in expanding your understanding and knowledge base to have more informed discussions with your clients on regenerative agriculture and its many parts. **J**

REGENERATIVE AGRICULTURE AN AUSTRALIAN FARM ADVISOR'S PERSPECTIVE

This article looks at the division of opinion, the principles and the growth in awareness of regenerative agriculture in Australia. It offers an approach for assessing the financial consequences of changing systems and for dealing with unconscious bias.

A polarising topic

Regenerative agriculture is a polarising and controversial topic, with critics and proponents equally vehement in their views. The internet is littered with compelling articles, opinion pieces and evidence supporting the case for and against it. The depth of choice allows for the biases of the reader to be fuelled, thereby further reinforcing their views and increasing the chasm between opinions, often without proponents even knowing that they are doing so.

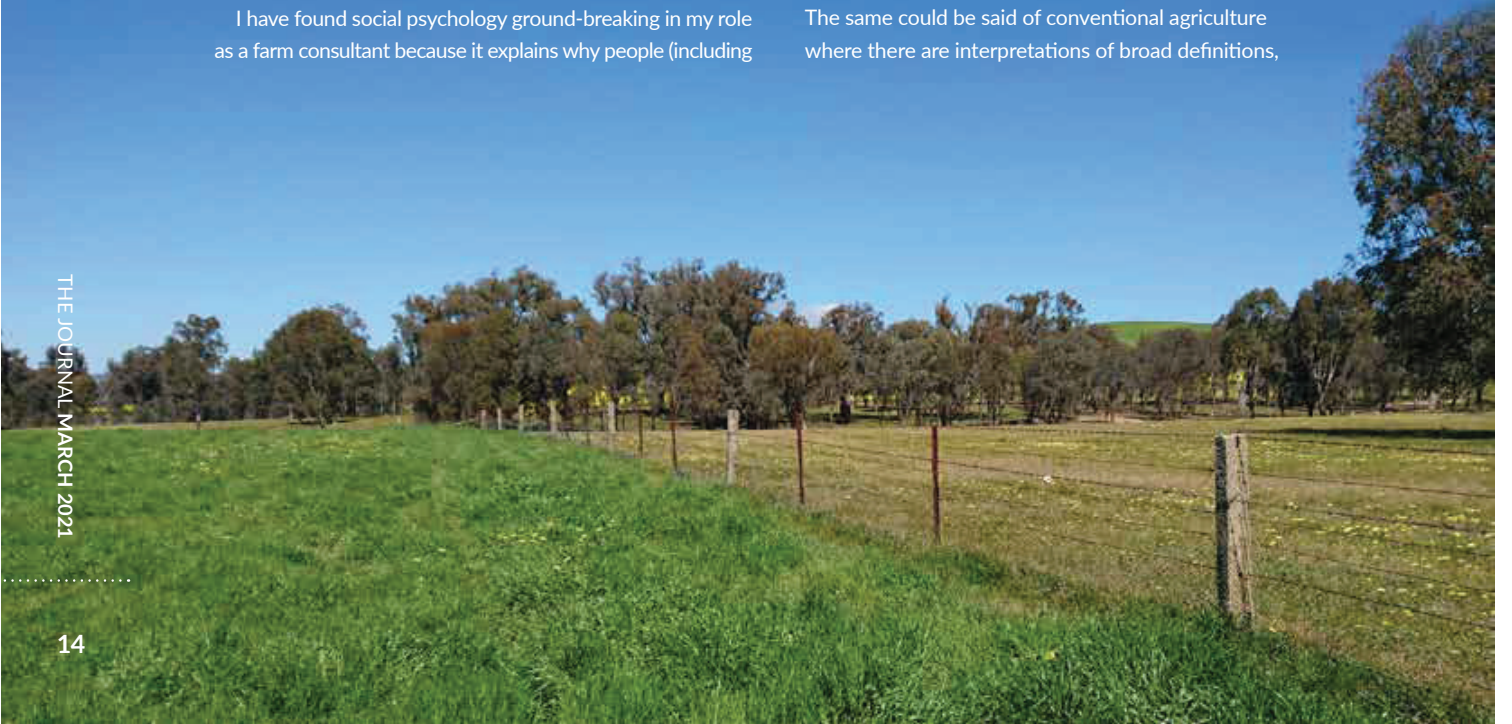
Rather than adding to the already long list of information supporting my own bias, this article will outline the growth in awareness of regenerative agriculture and why this may be occurring. It will also attempt to use my own layman's interpretation of the social psychology surrounding this, to assist in understanding why there is such polarity in opinion about regenerative agriculture, and how a change in approach may help in changing views on each side of the debate.

I have found social psychology ground-breaking in my role as a farm consultant because it explains why people (including

myself) act as irrationally as we do, even when we think we are being objective and unbiased. It also arms me with new ways of approaching old problems. In the interests of clarity, I value science and economics and I try to take an evidence-based approach to the delivery of my recommendations. I am an advocate of what I believe to be productive, profitable and environmentally sustainable agricultural systems. I am not opposed to most of the principles of regenerative agriculture. In fact, I consider many of them to be productive conventional practices and reasonable means of delivering improved productivity and desirable environmental outcomes.

Defining regenerative agriculture

The lack of a clear definition of regenerative agriculture makes any assessment of the philosophy difficult. Some proponents argue that it cannot be defined, while others define it by delivering their interpretation of the philosophy. The same could be said of conventional agriculture where there are interpretations of broad definitions,



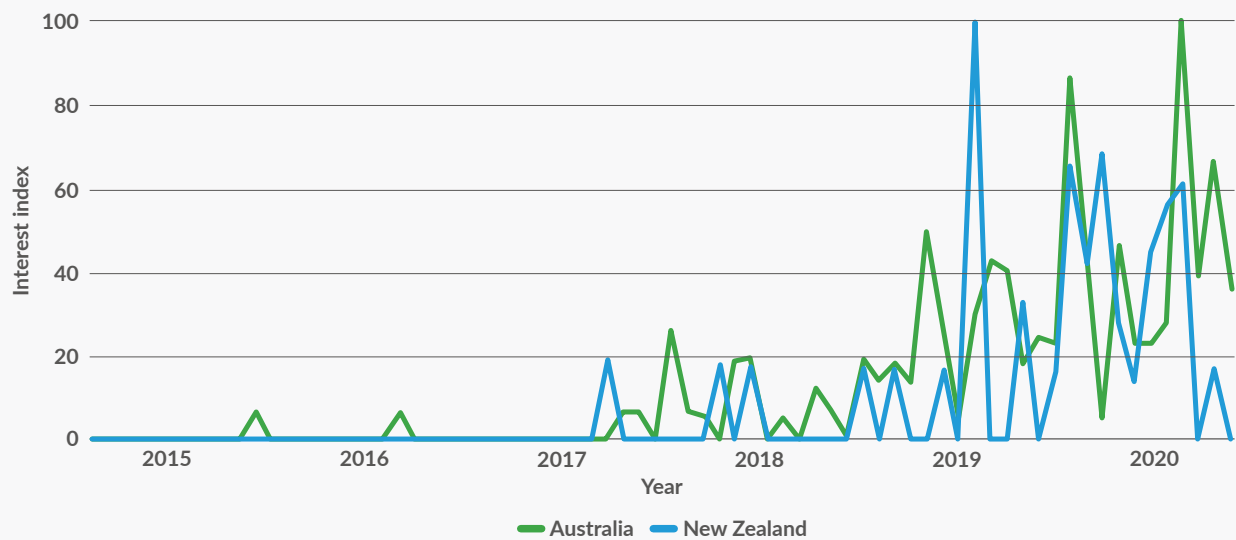


Figure 1: Google trends interest in the term 'regenerative agriculture' for Australia and New Zealand

Source: Google trends

many highlighting the inclusion of synthetic chemicals for managing pests and soil fertility. Conventional agriculture encompasses so much more than the use of synthetic chemicals, but as this is often a key point of differentiation it is the one that receives the most attention.

A study by Schreefel and colleagues in 2020, 'Regenerative Agriculture - The Soil is the Base', found that regenerative agriculture lacked a clear scientific definition relating to different perceptions of the practice. They found that regenerative agriculture focuses specifically on environmental issues, in particular soil issues. Based on their findings, they proposed a provisional definition of regenerative agriculture as an approach to farming that uses soil conservation as the entry point to regenerate and contribute to multiple ecosystem services.

Most of the objectives of regenerative agriculture identified in this article, which some proponents call principles, are consistent with the objectives of farm managers practising more mainstream conventional agriculture. Many conventional farmers are conducting regenerative practices, but are either unaware or unwilling to affiliate these with the broader philosophy.

This unwillingness to affiliate appears to come from their view that champions of the regenerative cause have denigrated them for what they consider to be the broadscale environmental damage caused by their farming approach. It is entirely plausible that the motivation of managers practising more mainstream methods to adopt activities that improve soil and ecological health are the same as those who align themselves closely with regenerative agriculture.

Patrick Francis, in his Moffitts farm article (www.moffittsfarm.com.au), suggests that ideology is the reason for the divisions over regenerative agriculture. He writes:

The adoption of RA amongst mainstream professional farmers over time might have been a fairly straightforward process if not for one barrier, the

associated ideology promoted by its champions that conventional farming methods and the agricultural scientists and technologists involved with its research and extension are responsible for land and water degradation and for producing food which is less healthy, possibly toxic, and is responsible for the decline in human health around the world. As a consequence, instead of being a methodology for positive change it has become a cause of division amongst farmers.

Cognitive dissonance is a theory discovered by Leon Festinger that recognises our motivation to maintain harmony and avoid disharmony in our beliefs and attitudes. Dissonance, or disharmony, occurs in our minds when confronted with a situation that conflicts with our beliefs or attitudes so the tendency is to reduce the discomfort. One way of reducing the discomfort when presented with evidence that challenges beliefs is to refute it. The more time and energy invested in the beliefs, the harder it can be to accept the evidence, so the more forthright one becomes in them. This may explain what is now a great chasm between the proponents of regenerative agriculture and those refuting its claims.

Regenerative agriculture in Australia

The Australian Bureau of Statistics does not appear to capture data categorising farm businesses by farming philosophy or farming system. Using objective data to quantify the number of farmers in Australia affiliating them with the philosophy is therefore difficult. Based on the increased number of media and internet articles publicising the practice it would seem logical that there are more farmers now involved than in the past, but the reality is that this is no more than the availability heuristic at play.

Google trends can be used to track interest in regenerative agriculture in Australia over time (see Figure 1). The numbers represent internet search interest relative

On average, the costs of regenerative producers were reduced by 33%.

to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term and a value of 50 means that the term is half as popular. A score of zero means that there was not enough data.

Interest peaked in Australia in the week of the 27 September to 3 October 2020, while it peaked in August 2019 in New Zealand. In Australia this was related to the airing of an ABC Australian story on Charles Massy, an advocate of regenerative agriculture who has been criticised by the scientific community for the lack of evidence supporting claims. The story did much to advance the regenerative cause, but little to add to the weight of evidence supporting some of the claims. Storytelling trumps facts in the race for audience attention, and an alternative method to food production without reliance on synthetic chemicals that heals the earth is absolute TV gold.

Most farmers who do not identify with any particular farming brand, but who have made significant advances in improving soil health, groundcover, water use, knowledge, skills and profitability, go unrecognised as they are not as newsworthy.

Financial consequences of moving to regenerative agricultural system

While every farm business manager is entitled to farm in a way that suits their own beliefs and achieves their own goals, provided they are morally and legally defensible, they are also entitled to facts and evidence upon which to base their judgements. Facts and evidence are different to case studies and anecdotes and, while they may do little to change beliefs, it is important that they are presented. Business management and finance is one area where the facts are particularly important because erroneous assumptions can mean the difference between being in business or not.

The following are seven key practices to encourage farm advisors, when dealing with clients who are interested in regenerative agriculture, to reflect on how their own and their client's beliefs are derived and to encourage deeper thought on the subject:

1. Qualify the financial position of proponents
2. Quantify the business case
3. Become financially literate and understand the numbers
4. Accept the change – the problem might be your beliefs
5. Educate yourself
6. Continue to challenge clients with questions
7. Measure client beliefs and profile client attitudes and capabilities.

1. Qualify the financial position of proponents

One observation of some high-profile proponents of regenerative agricultural systems in Australia is that their farming businesses appear to represent a small proportion of their total business interests. These people typically have access to capital that most farm businesses don't, which means these businesses may be more insulated from failure. Quantification of the extent to which externally generated capital is funding the farming operations of these proponents would be useful so that those without the same luxury do not get a false sense of financial security.

2. Quantify the business case

The difficulty in quantifying a business case is that there is little production and financial data to draw on for comparative financial analyses. The typical analytical approach to assessing a business case when making a change in system is to conduct a partial budget. This requires an assessment of the changes in production, expenditure and income from the system change relative to the existing business performance. The challenge is locating detailed production and financial data quantifying the changes over time.

The internet is awash with case studies and motherhood statements about components of production that change after moving to regenerative agriculture, but sadly it is devoid of the higher-level quantitative financial and production data necessary to conduct a partial budget.

The two most quoted studies with real comparative financial data of regenerative versus non-regenerative systems appear to be those of LaCanne and Lundgren in 2018 and Ogilvy and colleagues in the same year. The former is a US study comparing production and profitability of corn producers, while the latter is a comparative study of Australian livestock farmers.

The LaCanne study (10 farms of each) found the pooled average results of the regenerative farmers generated 78% more profit when compared to the non-regenerative farmers from 29% less yield, due to significantly higher prices and livestock income from grazing cover crops during the fallow period. The higher prices were related to organic premiums or to the sale of grain directly to consumers as seed or feed, but the extent to which each method contributed to the price increase is unknown.

An interesting point about this study was that four of the nine regenerative producers with financial data received average corn prices of \$439/tonne, while the remaining five received an average price of \$122/tonne. This compares with average prices received of conventional farmers in the same study of \$126/tonne.

This suggests that four of the nine regenerative producers increased the average profit of that cohort considerably. The four regenerative producers who received a price premium generated average profits of \$2,550/ha. This compares with the five regenerative producers who did not receive a price premium who achieved average profits of \$886/ha and nine conventional producers who achieved profits of \$910/ha. On average, the costs of regenerative producers were reduced by 33%.

The Ogilvy study presented financial metrics of a relatively small sample size, but showed limited comparative financial data with no production metrics. This was a lost opportunity to produce highly valuable comparative data between regenerative and non-regenerative farms.

A rational approach

The following is an approach that may be of value in the absence of the depth of data. The analysis considers the economic outcome when moving from a conventional livestock system running 10,000 dry sheep equivalents (DSE) to a regenerative system.

A DSE represents the energy required to maintain a two-year-old, 45 kg dry merino wether. The production (assuming a beef system for simplicity) and the financial performance (assuming land values of \$850/DSE and livestock values of \$150/DSE) are shown in [Table 1](#). Column 1 of this table shows the conventional system, while Column 2 shows the partial budget with a change to regenerative agriculture. Columns 3 and 4 show the

financial outcome for an assumed regenerative system with and without price premiums.

The regenerative system metrics have been projected assuming a 30% production loss due to lower pasture growth due to the loss of fertiliser from the system. This figure is consistent with the LaCanne study. Expenses are assumed to be 37% lower than the conventional system due to less fertiliser and other expenses. Regenerative systems claim far lower costs compared with conventional systems, but any analysis conducted by a consultant with a producer should quantify the extent to which the reduction in costs is likely.

Higher prices?

Where prices are not different between systems (Column 3), profits decline in the regenerative system by approximately \$100,000 and profitability (assessed as return on assets managed) declines by 24% to 2.65% when compared to the conventional system. Prices need to exceed \$4.40/kg received for profitability to exceed the conventional system. This represents an increase of 20% over the price received in the conventional system. If there is no evidence for the extent of this price premium then it should be omitted from the analysis.

The LaCanne study showed that four of nine regenerative corn farming businesses with price data achieved a large price premium. It is advisable for clients to seek evidence that the proposed market is differentially pricing products from regenerative systems.

What is often not stated about differentially priced

Table 1: Methodology for comparative farm financial and production metrics

	1	2	3	4
	Conventional	Change from conventional	Regenerative without price premium	Regenerative with price premium
Production units - scale (DSE)	10,000	-3,000	7,000	7,000
Value of assets under management	\$10,500,000	-\$450,000	\$10,050,000	\$10,050,000
Gross profit (\$/DSE)	\$73.50	\$0.00	\$73.50	\$87.96
Enterprise expenses (\$/DSE)	\$12.86	-\$1.29	\$11.58	\$11.58
Overhead expenses (\$/DSE)	\$23.89	\$0.00	\$23.89	\$23.89
EBIT (\$/DSE)	\$36.75	\$1.29	\$38.04	\$52.50
Gross profit	\$735,000	-\$220,500	\$514,500	\$615,746
Overhead expenses	\$238,875	-\$71,663	\$167,213	\$167,213
Enterprise expenses	\$128,625	-\$47,591	\$81,034	\$81,034
EBIT/Profit	\$367,500	-\$101,246	\$266,254	\$367,500
Return on assets managed	3.5%	-0.9%	2.6%	3.7%
Production (kg/DSE)	20	0	20	20
Production (kg lwt)	200,000	-60,000	140,000	140,000
Cost of production (\$/kg lwt)	\$1.84	-\$0.06	\$1.77	\$1.77
Price received (\$/kg lwt)	\$3.68	\$0.00	\$3.68	\$4.40

Prices need to exceed \$4.40/kg received for profitability to exceed the conventional system. This represents an increase of 20% over the price received in the conventional system.

livestock produce is that it may require a system change to receive the market premium. Typically, this means moving away from a low-cost system (with a single confined joining period) to a production system (with a time of trading animal turn-off suited to an area-specific feed supply curve). Any change that requires weight gain during a period when feed supply or feed quality is limited, or multiple joining times during the year, will typically result in far higher cost per kilogram produced.

Farm businesses that achieve price premium typically invest an inordinate amount of time and effort in building relationships that are necessary to secure and retain a premium. This may be time well spent where the premium is of an adequate magnitude relative to the base price, but the marginal cost of time is not always recovered. A business model that requires constant nurturing of end user relationships to maintain a price premium is not for everyone. It is therefore important to know whether the business has the personnel, time and skills required to achieve this objective prior to a change in farming systems approach.

Fifteen years of farm benchmarking analysis shows that the higher profit businesses usually have a combination of low cost of production with good levels of production, which means they maintain reasonable margins even when prices are low. A system dependent on high prices for success in commodity-based agriculture may face greater volatility and this should be factored into budget scenarios.

Column 2 of **Table 1** shows that it is possible to make a change to generate a lower cost of production but not

deliver a higher operating return. While there is a higher margin on every kilogram produced, there were far less kilograms produced so profits are lower. The key message is that a low cost of production with low production generates low profit.

Table 2 shows the comparative debt and farm financing for the same scenarios between conventional and regenerative systems with and without price premiums in a reasonably heavily leveraged business (\$4 million in debt). The analysis shows that interest costs decline by approximately \$20,000 in the regenerative system due to reduced liabilities after the liquidation of 3,000 DSE at \$150/DSE and lower operating costs. Capital expenditure is assumed to be \$50,000 regardless of system, leaving \$109,250 in the conventional system for debt repayment and personal expenses, while this is reduced to \$52,324 in the regenerative system where no price premium is achieved.

Finance or interest coverage ratio, which is a measure of the ability to service debt and measured as EBIT divided by annual interest costs, falls from 2.6 times in the conventional scenario to 2.2 times in the regenerative scenario without a price premium. While the finance coverage ratio of 2.2 may still be within the realms of bank safety, one large question is whether the personal financial goals of the manager and their family are still being achieved. If not, then alternative options such as trialing the system on a portion of the property may be a useful progressive action.

It is possible that the client is willing to wear the financial consequences of a system with lower production

Table 2: Comparative liabilities and below the profit line expenses

	1	2	3	4
	Conventional	Change from conventional	Regenerative without price premium	Regenerative with price premium
Liabilities	\$4,000,000	-\$569,254	\$3,430,746	\$3,430,746
Net equity	62%	4%	66%	66%
Interest rate	3.5%	0.0%	3.5%	3.5%
Interest cost	\$140,000	-\$19,924	\$120,076	\$120,076
Tax @ 30%	\$68,250	-\$24,397	\$43,853	\$74,227
Net profit after tax	\$159,250	-\$56,926	\$102,324	\$173,197
Capital expenses	\$50,000	\$0	\$50,000	\$50,000
Debt repayment/personal	\$109,250	-\$56,926	\$52,324	\$123,197
Finance coverage ratio	2.6	-0.4	2.2	3.1

Table 3: The same profit per DSE with poor resource efficiency delivers low profitability

SYSTEM	A	B
Stocking rate (DSE/ha)	7.5	15
Profit (\$/DSE)	\$35	\$35
Profit (\$/ha)	\$263	\$525
Land capital (\$/ha)	\$12,750	\$12,750
Livestock capital (\$/ha)	\$1,125	\$2,250
Total investment (\$/ha)	\$12,875	\$15,000
Return on assets managed	1.9%	3.5%

Source: www.farminstitute.org.au/publication/occasional-paper-may-2020-regenerative-agriculture-quantifying-the-cost-2/

It can be hard for a farm advisor to accept a client’s choice to take action that may be contrary to the advice provided or to the beliefs of the advisor.

because the system meets other higher priority goals. This is entirely appropriate given that it is their choice. The process of quantifying the value may, however, assist them in adjusting the order of priority.

3. Become financially literate and understand the numbers

Regardless of what role the farm advisor has in the business there is value in becoming financially literate. Agronomists, livestock production advisors, bankers and agricultural chemical salespeople are all in the business of giving variants of investment advice, so understanding and articulating the returns generated on the investments made is important.

Financial literacy is a skill which means that it requires repetition to improve. Appropriate course attendance is a useful starting point, but it is the application of the information in real world circumstances that cements the principles. Too often the learning stops after the attendance of the course as no application was made beyond the first step.

Financial literacy allows for the identification of some of the critical analysis approaches, which can be important when delivering financial results. For example, a recent study compared profit per DSE as its key financial metric for comparison of systems in the absence of stocking rate or production data. This measure, in the absence of other important information, provides limited information about livestock business performance and efficiency. The same level of profit per DSE between businesses can deliver very different levels of whole farm profit and profitability due largely to differences in production per hectare.

Profit is an absolute dollar figure, while profitability is a measure of resource efficiency. At a whole farm level, profitability (otherwise known as operating return or

return on assets managed) measures profit relative to the value of all of the assets employed to generate that profit. In a business like broadacre agriculture, where approximately 80% of the capital employed is related to the value of the land, resource efficiency matters.

At the same level of profit per DSE, but two very different levels of feed utilisation, profitability will be considerably different. For example, **Table 3** shows two systems (A and B), each with the same profit per DSE. Due to efficient levels of feed utilisation, System B allows for a higher stocking rate of 15 DSE per hectare compared to System A where high levels of feed wastage occur.

The investment in land capital is the same, regardless of whether the 15 or 7.5 DSE per hectare stocking rate is managed, but the livestock investment is lower per hectare in System A where the stocking rate is lower. Irrespective of having the same profit per DSE, the profitability (3.5%) of System B is 1.8 times higher than the profitability (1.9%) of System A.

This example demonstrating the importance of financial literacy was examined in detail in an occasional paper (May 2020) published by the Australian Farm Institute, which also compared operating returns of managers using regenerative and non-regenerative farming systems.

4. Accept the change – the problem might be your beliefs

It can be hard for a farm advisor to accept a client’s choice to take action that may be contrary to the advice provided or to the beliefs of the advisor. The advisor will question their own self-worth and sense of self-importance. The view from the advisor’s perspective may be, ‘I’m a smart person, I have good skills and technical expertise and I deliver trustworthy recommendations and now, by not taking my advice, you are telling me that I am bad and

In the absence of an instrument for measuring beliefs, a starting point for farm advisors is to spend time understanding what the client believes and why they do.

untrustworthy.' In short, the farm advisor sees the client decision as an attack on their identity, or as a shortcoming in their ability to communicate and articulate a clear message with proven outcomes.

This is a problem that exists in the mind of the farm advisor and not in the mind of the client. Rocket scientist Ozan Varol suggests that when beliefs are entwined with identity (as they typically are), changing your mind means changing your identity and that is difficult. Varol suggests that a potential solution is a mental shift separating you from your products. He gives an example of how a subtle shift in his language tricks the mind into separating the arguments from the person, which allows the arguments to be viewed with a greater degree of objectivity. In an advisory role an example might be a move from, 'In my report, I recommend ...' to 'This report recommends ...'. A disagreement in beliefs moves from being personal to a hypothesis proven wrong.

Further comfort for the farm advisor can be gained from an improved understanding of confirmation bias, which is our tendency to overvalue evidence that confirms existing beliefs and undervalue evidence that contradicts them. This may also be disconcerting to the farm advisor, as it will now be evident that they themselves are biased. This reality requires self-reflection and assessment to establish the extent to which their own biases drive recommendations.

The understanding of confirmation bias has been personally ground-breaking to me, as it explains why the presentation of evidence and facts has been proven to be an ineffective strategy in the changing of minds, regardless of how apparently compelling they may be. The mind is not good at following facts and scrutinising evidence due to our beliefs and the discomfort we feel when they are challenged. This has been a confronting finding for me as I view myself as a rational and objective thinker who takes an evidence-based approach. The reality now confronting me is that I am biased.

Even when conducting the research for this article I demonstrated my bias with Google searches. I read in detail the articles that appeared to take an evidence-based approach to the topic and skimmed the sites that appeared not to support my belief.

5. Educate yourself

My university education is in the technical sciences of agronomy and livestock production. This training taught me how to think, how to review literature, seek evidence, analyse and evaluate data. As my career progressed, I learnt that maximum production was different to

economic optimum, so I invested in learning about farm business management. My latest informal learning is about social psychology. I have found this area of science to be illuminating in providing me with an understanding of why people (including myself) behave the way they do, in most cases defying what I consider to be logical. My ability to influence, engage and improve client outcomes is dependent on my ability to implement components of each of these fields.

6. Continue to challenge clients with questions

Many beliefs form from the personal and emotional influences of family, culture and surroundings. The mantra of critical thinking is to form beliefs on the basis of the evidence. The problem with this approach is that the sense of disharmony, known as dissonance, that we experience subconsciously when we learn that we have made a mistake causes us to take a biased approach to the evidence we seek. This results in the use of data to support or reinforce our belief regardless of the truth of that belief.

Peter Boghassian, Assistant Professor of philosophy at Portland State University, suggests that rather than telling people to form beliefs on evidence they should be encouraged to seek information that could undermine their confidence in a particular belief. For example, consider a client who has formed the view that regenerative agriculture will deliver superior soil health, better environmental resource efficiency and improved economic prosperity relative to their existing conventional approach. Boghassian's approach might be to ask on a scale of 1-10 how confident that client is in those beliefs. Once the number is articulated ask what evidence would be required to undermine their confidence in that score. That is, if the answer was 9, ask what it would take to reduce confidence to 5, then invite the client to seek out the information that would reduce that confidence.

This approach isn't just one that applies to advocates of regenerative agriculture; it is equally important that proponents of conventional agricultural systems apply this approach to their own beliefs. For example, my personal view is that farm managers of sensible conventional broadacre livestock systems in southeastern Australia can deliver equivalent or superior soil health benefits with superior farm profitability when compared with managers adopting regenerative agricultural systems in the same environment.

On a scale of 1 to 10 how confident am I in this belief? My score is a 7, indicating that I am reasonably (but not totally) confident. What evidence would be required for

Table 4: Client profiling can lead to better tailoring of advice

PROFILING ASSESSMENT CRITERIA	SCALE		
Ability to critically appraise information	Poor	Moderate	Good
Propensity to accept being challenged	Low	Medium	High
Likelihood of implementing changes	Low	Medium	High
Technical ability to implement recommended changes	Low	Medium	High
Balance sheet strength (net equity)	Low	Medium	High
Operating performance	Poor	Moderate	Good
Ability to understand complex systems-based issues	Poor	Moderate	Good
Stage of the business cycle	Start-up	Consolidation	Retirement

Financial literacy is an important skill when advising on any systems change.

me to change my belief? Comprehensive independent soil chemical analysis, soil structural assessment and soil biological assessment comparing a pool of highly productive commercial scale conventional systems with a pool of commercial scale regenerative systems, preferably by year over a five-year period. For the comparative farm financial performance, I would require comprehensive comparative farm financial and production (benchmarking) data using consistent methodology over at least five years.

Daniel Kahneman in 'Thinking Fast and Slow' divides the mind into two systems. System 1 is the quick fire part of the brain that uses certain rules to allow us to respond quickly, intuitively and efficiently. System 2 is slower, more analytical and better at reasoning. Kahneman suggests that the initial attempt to believe something is an automatic operation of System 1. The problem is that System 1 is gullible and biased to believe, while System 2 oversees doubting. The beauty of Boghassian's approach is that the challenge requires thought. This progresses thinking from System 1 to System 2 where doubting is more likely. Each question is an opportunity to revise beliefs and to seek evidence that disconfirms.

7. Measure client beliefs and profile client attitudes and capability

The medical sciences have demonstrated the value of the development of instruments for measuring beliefs and attitudes and values. By identifying the strength and significance of beliefs, educational interventions have occurred to change the approach to treatment and rehabilitation from certain diseases. The same approach would be useful in agriculture.

In the absence of an instrument for measuring beliefs, a starting point for farm advisors is to spend time understanding what the client believes and why they do.

Try to understand how entrenched the belief is in their life and how much emotional energy has been invested. Another approach that may be useful is client profiling. It is probable that farm advisors already do some sort of client profiling, but it will typically occur subconsciously and undocumented. Their advice will change depending on profile outputs. Documenting the process can be useful as it sets out the deficiencies and highlights areas of strength and weakness.

Table 4 is an example of client profiling. The highlighted cells correspond with the advisor response for each criteria of client profile assessment. The client in this example has a high propensity to accept change, but the deficiency appears to be in balance sheet strength and technical ability to implement changes. Better suitability and adaptation of advice is the key benefit of profiling.

Conclusion

Depending on their interpretation, there are sound principles underpinning the regenerative agriculture philosophy. Many of the practices that deliver on the principles are already being implemented in conventional farming systems. The pursuit and delivery of facts and evidence to refute or support claims is an important scientific approach but beliefs, which are not necessarily evidence-based, rule the mind. Finding a way to beat the easily-led belief system requires a new approach that engages the deeper thinking part of the mind.

Financial literacy is an important skill when advising on any systems change. It allows for a deeper understanding of the issues and delivers the ability to assess the financial impact of the changes to the client. The client can then make an informed decision about the value of the change.

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