



MENZIES
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From the ground up: Unleashing the potential of soil

A Menzies Research Centre Policy Brief



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Published by:

The Menzies Research Centre Limited

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Designed by: Branded Graphics

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Introduction

Human resilience on this challenging but rewarding continent is a story of innovation and investment in the soil.

It starts with the innovation of fire-stick farming, the use of controlled burning to create grasslands on which hunted species could roam and bush foods could be harvested.

It took a new turn with the arrival of European settlers like convict farmer James Ruse who pioneered the use of burnt timber as a source of potash and scavenged for organic matter to create reservoirs of nutrients and water.

The improvements continue to this day with the adoption of no-till farming and the precision application of fertiliser and pesticides which increases the retention of ground cover.

The common thread to those innovations is that they increase the level of soil-carbon. Fire-stick burning at low temperatures produces charcoal which stores carbon in the soil. Plant growth captures atmospheric CO₂ which is sequestered into the ground through the process of photosynthesis.

Mechanical innovation, improved crop varieties, selective breeding, biotechnology and precision digital agriculture feature heavily in the story of agricultural progress.

The ultimate constraint to productivity, however, is the fertility of the soil. The size and quality of harvests, proceeds from the sale of livestock and ability to withstand the ravages of the climate are directly related to the level of soil organic carbon (SOC).

In a year when the nation has been buffeted by a series of external shocks unprecedented in most of our lifetimes, a national initiative to raise the carbon content of soils is one of the most effective steps we can take to rebuild our natural capital.

It is an investment that will produce short-term dividends for business, biodiversity and bio-sequestration that will be sustained and enhanced in the long term.

The public and private benefits of improving the health of soil are extensive. Healthier soils foster biodiversity above and below the ground.

Soils feeding a layer of healthy ground cover reduce greenhouse gas emissions as carbon dioxide is drawn out of the atmosphere by plants which transfer carbon into the ground through the processes of photosynthesis, respiration, and decomposition.

Healthier soils yield richer vegetation cover for livestock and more nutritious food leading to healthier people and happier, more resilient farmers.

The density of SOC is a reliable and consistent measure of soil health. Soil organic carbon is a renewable resource that began accumulating with the arrival of land-based plants almost half a billion years ago. The rate of accumulation can be increased by making relatively simple changes to land management.

This paper assesses the benefits of farming methods that increase the level of soil carbon for farmers, the economy and stewardship of the wider environment.

It considers how government policies can encourage and increase the national reserve of soil carbon and the multiple benefits that would flow.



It anticipates the substantial contribution the farming sector can make to reducing greenhouse emissions once the measurement of soil carbon content becomes cheap and ubiquitous, a breakthrough that we predict will occur well before the end of this decade.

We recommend practical steps the Government can take immediately that can potentially deliver gains in a single season. We recommend a program of peer-to-peer knowledge-sharing, that will harness the wisdom and experience of farmers to encourage the evolution of farming techniques and the adoption of best practice.

This paper is neither a manifesto for revolution nor an instant recipe for perfect farming. Innovation in agriculture, as in every other sector, occurs through evolution and constant improvement.

We do, however, call for a change in thinking, recognising that farming backed by robust agricultural science is the solution, not the cause, of many of the environmental challenges we face today.

We argue that a deliberate and consistent national focus on soil enrichment, driven by national leadership from politicians, farming groups and farmers themselves, will deliver substantial benefits far beyond the farming sector.

We argue too that progress will largely be achieved by commercial incentives, not government spending or regulation. The biggest impediment to progress in agriculture is non-market failure, the limitations and false incentives imposed by poorly calibrated policy.

We should neither underestimate nor overestimate the role of government in the transition to carbon-conscious land management on private property. While the heavy lifting will be carried out by the private sector, the Government can smooth the way with relatively small investments in training, targeted grants and contingent loans.

More broadly, politicians have a responsibility to lead a more intelligent debate on environment, agriculture and energy policy that embraces complexity and uncertainty. The current debate is sorely lacking in that regard.

The Government's chief responsibility is to create a regulatory environment where enterprise can thrive, where risks are taken with an expectation of reward, and to align commercial incentives to farmers with the national interest.

In this report, we do not set out to add to the large volume of international literature arguing the case for what is sometimes referred to as regenerative agriculture. Nor is this an exercise in scientific empiricism. The underlying scientific assumptions behind the role of soil organic carbon in nature are well established and are barely in dispute.

All that has been missing from this policy discussion up to now is the resolve to raise soil improvement from the nice-to-do tray to the must-do tray in the offices of policy makers, industry groups and farmers in Australia.

Advocates sometimes speak of the need for a call-to-action moment to build political resolve towards action on any given policy matter. The recent east coast drought, the second prolonged dry spell this century, is just such a call.

We applaud the Government for its comprehensive package of drought relief measures. The wisest way to invest these funds is to build the resilience required to cope with the next natural emergency rather than patch up the wounds from the last.

Our report looks specifically at how these committed expenditures should be spent, principally in sponsoring peer-to-peer training led by established groups of agronomists with experience and knowledge in this field.

We also canvass other practical steps that could be easily implemented with minimal expenditure by government. They include income-contingent loans to help farmers to take the first step on the journey, a certifiable audit of SOC on their property.

We also attempt to paint the bigger picture that places these practical initiatives in the context of a larger strategy.

The health of our soils is key to the future of farming, our economy and security.

It is key to restoring landscapes and overcoming the perennial problem of providing a consistent water supply.

It is key to restoring balance in the carbon cycle by ensuring that excess carbon dioxide emissions caused by human activity are safely absorbed in the soil by the natural process of photosynthesis.

In the 10 months that we have been working on this policy we have frequently reflected on the ambition of its claims. Sir Humphrey Appleby would no doubt have described a strategy to increase farm productivity, restore our natural landscape and decarbonise the atmosphere as “bold”.

Yet we make this claim based on a solid assessment of the science, the experience of farmers, the wisdom of experienced agronomists and the evidence before our own eyes. The green landscapes, lush paddocks and thriving water courses we saw on our field trips to rural NSW were proof that the concept works.

THE CASE FOR INVESTMENT IN SOIL ORGANIC CARBON (SOC)

The business dividend

The business case for farmers to adopt resilient farming methods is compelling. Farm productivity is increased over the cycle, inputs can be significantly reduced, the pain of entering drought is relieved and drought recovery accelerated.

Organic carbon-rich soils are absorbent, reducing reliance on irrigation, the construction of dams. This reduces the volume and speed of run-off during storms, retaining soils, reducing erosion and preserving the landscape.

Food grown in carbon-rich soils tends to be more nutritious, presenting opportunities for premium pricing.

The growth in international demand for carbon offsets opens a new opportunity for revenue through the sale of credits. The cost of measurement and certification is currently high. The costs are likely to fall in the next two years in line with the Federal Government’s target price of \$3 per hectare per annum.

The Government should assist by fast-tracking changes to the regulations that govern the award of Australian Carbon Credit Units (ACCU) by the Clean Energy Regulator. The rules are rigid and over-prescriptive and in some cases contradict best farming practices, such as the regulations limiting tree canopy cover.

There is also a role for government in encouraging farmers to set the meter running by conducting an audit of their current stocks of SOC content. The certified measurement will serve as the equivalent of a bank balance against which future increases can be measured.

Sequestered carbon from this point on can be credited to the farmer and increase the accuracy of the National Greenhouse Accounts in tracking progress towards meeting Australia's international greenhouse gas emission targets.

The combination of private and public benefit justifies a measure of government assistance, which might be provided through income-contingent loans repaid as a percentage deduction on ACCU credits. We recommend that any such scheme be capped to limit market distortions.

The environmental dividend

Public policy attempts to balance the benefits of industrial farming against protection of the natural environment have historically been crude, burdensome and frequently ineffective. It is leaned heavily towards prescription, regulation and enforcement. It has transferred power and resources from farmers to bureaucrats.

Choices best made standing in the paddock are being resolved by officials in city office blocks.

Many of these decisions stem from the common fallacy that human activity is inherently destructive. The policy challenge is seen as damage limitation, rather than improvement, with the best outcome being to shut down farming altogether.

This approach is enshrined in the goal of sustainability, the dominant narrative of the last 50 years, that begins with the assumption that the earth contains fixed reserves of resources which must be distributed between earth and nature.

The adoption of the sustainability narrative has been effective in highlighting the need to mitigate against the impact of human activity on the landscape.

But it has put constraints on our thinking, denying the opportunity of devising an approach that both enriches nature and materially benefits humankind.

It is inclined to discount the dividends accrued to the natural environment by the development of improved technology, a process that is at least as old as the industrial revolution.

Soil carbon management breaks that mould, producing outcomes that increase the benefits human derive from the land while improving the condition of the land itself.

It places human activity with the natural carbon cycle. Anthropological imbalance in the carbon cycle is balanced by anthropological changes to the land, delivering a net gain for both.

Crucially, farming becomes part of the solution, rather than a part of the problem. The goal is achieved not by restricting farming, but by farming better.

Power is devolved from the bureaucrats to farmers who are empowered to make informed choices based on commercial incentives.

Left to their own devices and with the knowledge to make informed choices, farmers can be trusted to make the best decisions. They have skin in the game. Farmers have a vested interest in maintaining, and indeed improving, the quality of their land and the best local knowledge about how a particular lot behaves.

Our confidence in farmers is buttressed by our confidence in quality of the science regarding soil carbon. Raising the level of organic carbon has a multiplier effect. Increasing the concentration of organic carbon by even smaller amounts triggers a series of interdependent processes that create a hive of natural activity.

When plants absorb water, carbon dioxide, and energy from the sun, it triggers a chemical reaction that produces sugars in the form of glucose that is exuded through the roots.

Former Commonwealth chief scientist Robin Batterham described it to us in these terms:

“Every little CO₂ molecule that gets into the plant, is like ringing a dinner bell. Down in the soil, it's all this tribe, waiting to feast. Sitting there at the dinner table, waiting on these exudates, are bacteria which feed on these organic compounds and turn them into something which they need to live, to grow and to multiply.

“As they die, fungi feed on the decomposing bacteria. There are worms who chomp on the roots, and then there are nematodes that feed on the bacteria and the fungi. And then there are scavengers, insects that crawl around and chomp up the nematodes. Forms of life further up the food chain, for example birds, eat some of the scavengers and so forth.

“This is the intricacy of nature. At a simple, overall level, the intriguing thing about this is that the system works.”

The increases in biodiversity from carbon-conscious farming extends far beyond the paddock. The absorbency organic carbon adds to soils reduces the velocity and volume of run-off, reducing the erosive power of water in natural watercourses.

Watercourses revert to their pre-farming condition, returning to a series of interconnected ponds that ebb and flow, rather than the drains they have essentially become.

Our field visit to the Mulloon Institute on the NSW Southern Tablelands provided living evidence of the increase of biodiversity that can occur in a relatively short space and time under such conditions.

One note-worthy triumph is the eradication in some stretches of the Mosquito fish, an exotic species that has plagued Australian waterways almost since its introduction in 1925. The fish thrives in fast-flowing water. Reducing the velocity has restored home-team advantage, allowing the population of native fish to recover.

The concentration of organic carbon in the soil is the clearest and most accurately measured determinant of biodiversity.

We recommend that it should be the chief metric in measuring biodiversity against which the performance of a farm should be calibrated. It is a far more accurate gauge than the rigid and prescriptive restrictions enshrined in state native vegetation legislation.

The outcome is measures by outcomes, not inputs or process. It is less prone to subjectivity or perverse incentives. It recognises that farming can be a benefactor to the land and that the cessation of farming activity can, in some circumstances, lead to a deterioration of biodiversity.

The climate dividend

Scientists estimate that 25 gigatonnes of organic carbon is safely buried in Australia's topsoil, an amount equivalent to roughly 180 years of national CO₂ emissions at the current rate.

Australia occupies 5.2% of the global land area giving it significant potential for sequestration.

By capturing and retaining additional carbon in soil, Australia can make a substantial contribution to the mitigation of carbon dioxide, methane and nitrous oxide emissions. An increase in the organic carbon content of soils of just 0.5 per cent, for example, would have the same effect as closing Australia's coal-fired power stations for three years.

The contribution that carbon-conscious farming can make to balancing the terrestrial carbon cycle is recognised in the 4 per 1000 initiative launched at the UNFCCC Paris meeting, and the Australian Government's Emissions Reduction Fund (ERF).

The ERF offers scope to reward farmers for sequestering organic carbon with Australian Carbon Credit Units. However, the current regulatory framework makes it all but impossible for farmers to benefit.

Our report recommends swift reform to simplify compliance, align regulations with best farming practices and increase transparency.

Coupled with that, the cost of measuring must be reduced. The Federal Government's goal of bringing down the cost of certifiable measurement to \$3 per hectare per annum is achievable through innovation in technology and innovation in government regulation.

The commercial incentive offered by an efficient offset market hastens the transition to farming practices that enhance the content of carbon in the soil.

It offers a pathway towards carbon-neutral farming. Certifiable measurement will provide more accurate data on Australia's net emissions and present a clearer picture of progress towards meeting international commitments.



A more intelligent discussion

Few policy areas have been as hotly contested in the last 20 years than the environment. The polarisation has not been helpful.

The Menzies Research Centre advocates a different approach in line with the Liberal principles it is bound to uphold.

A Liberal approach to public policy favours change through consensus rather than command. It seeks progress through the collective actions of millions of individuals, each pursuing their own self-interest.

A Liberal approach:

- recognises the weakness of central planning and the risks of unintended consequences;
- prefers practical, affordable solutions with measurable outcomes rather than policies dictated by theory;
- is wary of simple solutions to complex problems;
- advocates reform through continuous improvement rather than revolution;
- does not regard human prosperity and the natural world as in conflict;
- recognises that the largest investments in natural capital are made in the wealthiest countries.

A policy that aims to increase the quality of agricultural soil while delivering co-benefits to the environment meets those criteria.

By focusing on soil, a renewable resource vital to farming and the natural environment, we can gain a better understanding of the carbon cycle on which all life depends.

Nick Cater
Executive Director
Menzies Research Centre
February 2021

Principles

Principle 1

Preparing for the next drought is the best way to help farmers recover from the last.

Improving resilience reduces future government dependence. It is a long-tail investment in businesses that strengthens communities and sustains economic activity.

Principle 2

Farmers and regions should be in control of decision making.

Incentives to encourage farmers is better than a regulatory approach which dictates to farmers what they should or shouldn't do. Best practice should be determined by outcomes, not procedures.

Principle 3

This policy should be implemented using existing structures.

A peer-to-peer training program should, where possible, use and improve existing farming benchmarking groups and create new groups only where there are gaps.

Principle 4

Funding for policy proposals should be provided through existing programs and at least cost to government.

The agriculture sector has myriad organisations and programs such as the Regional Investment Corporation; the National Landcare Program's Smart Farms Small Grants; the Clean Energy Finance Corporation; and the Future Drought Fund's \$20m Farm Business Resilience program that could provide funding for these policy proposals.

Recommendations

Recommendation 1

The measurement and certification of soil organic carbon (SOC) should be urgently reformed to make it simpler, fairer and trustworthy.

Recommendation 2

SOC content should be adopted as the principle metric in the certification of improvements to biodiversity.

Recommendation 3

A capacity and capability, peer-to-peer led Resilient Agriculture skills development program should be established using existing support networks.

Recommendation 4

A new “Resilient Agriculture” loan product should be made available through the Regional Investment Corporation with loan periods of at least five years and interest-free periods of up to five years.

Recommendation 5

The Government should expand the charter of the Rural Financial Counselling Service (RFCS) to deliver rural business support to improve farmers’ financial literacy and planning and to support access to drought preparedness measures.

Recommendation 6

Government should fund SOC baseline measurement through an income-contingent loan scheme, similar to HECS-HELP. The loan would be repayable when the yield from Australian Carbon Credit Units (ACCUs) reaches a nominated threshold.

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OVERVIEW

Agriculture occupies 51% (394 million ha) of Australia's land mass. The sector output in 2018-19 was almost \$62 billion and some 79% (\$49.2 billion) of agricultural produce is exported. The three dominant agricultural commodities exported last year were cattle and calves (\$9.485 billion), wool (\$4.159 billion) and wheat (\$3.676 billion). The output of the sector however, is expected to decrease to \$59 billion in 2019-20 due to the drought.¹

The health of Australia's agriculture sector is critical to the national economy. The importance of safeguarding Australia's food production, supply lines and water security has become more evident in the past year when drought, bushfires floods and a pandemic tested agricultural resilience.

The Australian Government has acknowledged the important role of agriculture in the recovery from the COVID-19 recession, the 2019-20 bushfire season and the recent three-year drought. These three events have taken an enormous toll on the economy, communities and the environment.

There is a significant opportunity for the Government to introduce policies that increase the drought preparedness of the agricultural sector and build on the Government's narrative of moving from in-drought support measures to building a resilient agriculture sector.

In the Commonwealth Government's Drought Response, Resilience and Preparedness Plan, Minister for Agriculture David Littleproud wrote: "Governments at all levels, industry and farmers themselves have a role in responding to this drought and making sure we are better prepared to deal with the next one."

There are multiple benefits from building a "Resilient Agriculture" policy including:

- Reducing the reliance on in-drought funding;
- Helping the Government and agricultural sector achieve their goal for agriculture to be a \$100 billion industry by 2030;
- Increased productivity and profitability of farming enterprises;
- A reduction in agricultural greenhouse gas emissions that will help meet our international commitments; and
- Potential income streams for farmers in return for carbon abatement and increased biodiversity certification.

¹ <https://nff.org.au/media-centre/farm-facts/>

THE IMPERATIVE FOR CHANGE

Government drought support

The response to drought draws heavily on the public purse. It is estimated that the Government has spent over \$8 billion on drought this century with a further \$13 billion on the Murray Darling Basin Plan which is part of the Government's strategy in response to the changing climate.²

The Coalition Government has implemented a variety of measures since 2013 including:

- Drought preparedness tax deductions for fencing, fodder storage and water in the first year;
- Investing in the Bureau of Meteorology to improve seasonal forecasts that support farmers' risk management decision making;
- Increasing Farm Management Deposits from \$400,000 to \$800,000;
- The instant asset write-off for machinery up to \$150,000;
- Investment into investigating new insurance products for the cropping sector;
- Setting up the Regional Investment Corporation and providing billions in low-interest loans to allow farmers and affected rural businesses to consolidate their loans and put downward pressure on bank interest rates;
- Continued investment in agricultural industry research and development to drive innovation in a variable climate (ie drought tolerant crop and pasture varieties);
- Further investment into the RFCS.

Many of the drought preparedness measures provide incentives for farmers to take advantage of cash flow from good years to build resilience. However, while the top 20-30% of the agriculture sector can absorb bad seasons, the rest of the community is challenged by cash flow.

Since the Agricultural Competitiveness White Paper was published in 2015, the Government has paid more attention to drought preparedness informed by a growing understanding of the importance of resilience.

The new National Drought Agreement (NDA) signed by Australian governments in December 2018 outlines how governments can best position farmers to prepare for, manage and recover from drought. It states a common intention to "increase the adoption by farming businesses and the farming sector of self-reliant, sustainable and resilient approaches to manage business risks, through improved skills and business decision-making, and the adoption of new knowledge and tools from research and development".

This approach is supported by industry. The National Farmers' Federation (NFF) endorsed the new National Drought Policy on behalf of its members. It stated:

*"The NFF's National Drought Policy prioritises objectives and outcomes that enhance long-term preparedness, sustainability, resilience and risk management for farming businesses and farming communities in order to minimise the impact of drought."*³

² <https://www.smh.com.au/politics/federal/the-cost-of-drought-and-it-s-just-going-to-grow-20191102-p536rd.html>

³ <https://nff.org.au/media-release/milestone-day-in-nations-new-future-focussed-approach-to-drought/>

In recognition of this new approach, in 2019 the Australian Government's \$7 billion drought measures package included a \$5 billion Future Drought Fund delivering \$100 million annually for drought preparedness measures.

The Government recently announced the allocation of funding for this year's drought preparedness measures. It is critical that government continues to deliver effective policies under this program.

Increasing the uptake of productive and profitable agriculture practices that maximise the environmental utility of farming systems will be central to the success of the Future Drought Fund and drought preparedness.

After extensive consultation with grower groups and stakeholders across the agriculture sector, a *Resilient Agriculture policy* was developed to tackle this need.

Resilient Agriculture

Resilient Agriculture is the mix of agricultural practices that results in the improvement of soil health. The major objectives of adopting Resilient Agriculture practices are: the improved water holding capacity of our soils; increased vegetation cover; improved management of animal impact in grazing situations, and integrated crop management in farming situations to manage pests and weeds and improve soil fertility. This leads to increased production and a reduction in inputs/overheads which has a tangible and positive impact on farm profitability and the environmental sustainability of farm businesses. Continuous improvement is also a key principle in the ongoing success of Resilient Agriculture.

In his 2019 report to the Australian Government, the Coordinator-General for Drought endorses this approach.

“Good management of natural resources improves long term drought resilience. Activities such as improving and managing vegetation cover, pest and weed control, addressing soil acidification, native pasture establishment and efficient use of water directly improve drought resilience.”⁴

Originally, “regenerative agriculture” was proposed to describe this policy approach but concerns were raised in the consultation process. Regenerative Agriculture can mean many things to many people. It evokes both positive or negative reactions. Some stakeholders associate the term with overly prescriptive rules on the types of farming that should or should not be practiced. We found that Regenerative Agriculture simply reflected practices aimed at improving a farming system's sustainability. However, we have opted to use the term “Resilient Agriculture” as it aligns with the Government's approach to build drought preparedness and it will avoid any divisive discussion.

Adopting Resilient Agriculture practices can improve a farm's drought preparedness, saving governments millions of dollars by reducing non-productive in-drought support packages as a result of Australia's ever recurring droughts. A Resilient Agriculture policy that delivers drought preparedness can improve a farm business' ability to absorb climatic shocks, provide economic stimulus in the wake of the COVID-19 pandemic, and contribute to combatting climate change through reducing the impact and frequency of bushfires and drought in the future.

Resilient Agriculture aims to improve soil health by increasing soil organic carbon (SOC) content. The Report of the expert panel examining additional sources of low cost abatement (King Review) provides an important link to our national carbon task.

⁴ <https://www.agriculture.gov.au/ag-farm-food/drought/drought-policy> p 8 viewed 13 July 2020.

“It is generally accepted that improving soil carbon has substantial benefits directly to soil health and productivity that accrue to farmers and the environment. Accordingly, there is growing interest in regenerative agriculture and this could be assisted if access to soil carbon credits became a low cost standard farming practice.”⁵

The top 20-30% of farm businesses are profitable, productive and innovative, capable of adopting new practices that deliver better environmental outcomes. However, take-up by the large middle in the Australian agricultural sector is less than optimal and this is significantly impacting on the sector’s overall resilience and productivity.

Soil organic carbon (SOC)

In farming SOC typically makes up between two and 10 per cent of soil mass and plays a vital role in the physical, chemical and biological function of agricultural soils.

It contributes to nutrient retention and turnover, soil structure, moisture retention and availability, degradation of pollutants, carbon sequestration and soil resilience.

Increasing SOC is the best measure for improving soil health. While there are a number of issues that impact soil health like sodicity, acidity and salinity, in general improvements in SOC indicates that these issues have been addressed.

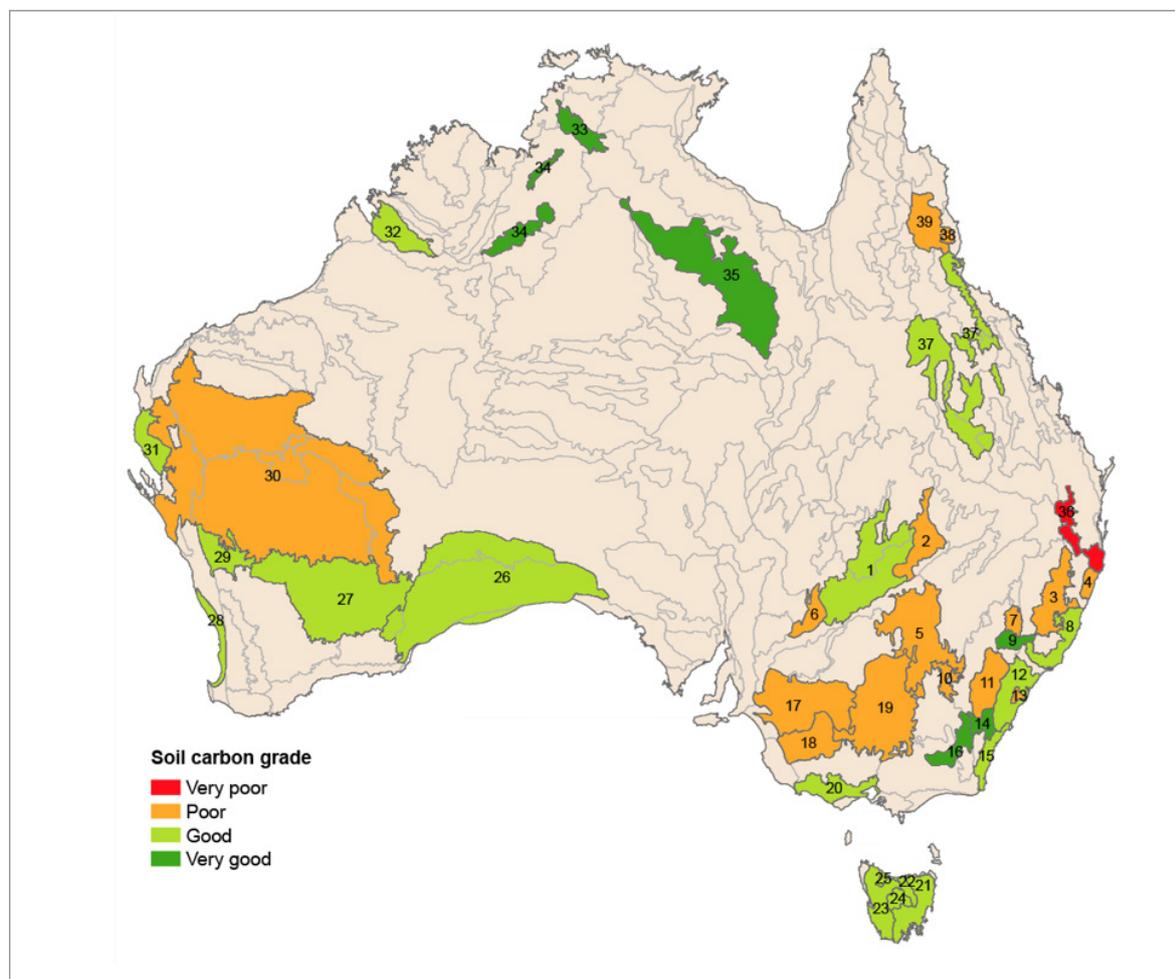
The actual amount of soil carbon that can be stored depends on the farming system (management practices), soil type and climatic conditions, and the initial soil carbon level at a given location.

There are a whole range of SOC levels in different soils. For instance, for the surface soils, SOC ranges from about 10% in the alpine soils to less than 0.5% in the desert soils. The amount of SOC stored in the soil profile can be considerable. For example, if there is 1% SOC over 30 cm soil depth, the amount of SOC stored over 1 hectare of land can weigh about 42 tonnes. Usually, the surface layer has the highest level of SOC which decreases with depth down the soil profile.⁶

⁵ King Review p 50

⁶ http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/210756/Increasing-soil-organic-carbon.pdf Viewed 1 August 2020

Soil carbon ratings for selected regions 2016



Source: Department of Environment, State of Environment 2016

Increasing SOC through Resilient Agriculture

Resilient Agriculture encompasses many practices, such as cover cropping, crop rotation, time-controlled planned grazing and optimising inputs and fertilisers. When these practices are applied to farms, SOC improves soil health, biodiversity, long-term yields, product quality, and in turn the profitability and resilience of farm businesses.

As many farmers know, there are many tools and innovations in digital and precision agriculture that can improve the impact of farming systems and enhance Resilient Agriculture practices. These include GPS mapping for application of seed and fertiliser or electronics for precision herbicide application that targets individual weeds or sensors to maximise water use efficiency and ensure livestock watering systems are functioning optimally.

The methods employed to improve soil health will vary depending on type of farming. The dominant land use in agriculture is livestock grazing, which accounts for 51% of farming land. Cropping accounts for around 4%

of land use but when you take into account the role of cropping in modified pastures used in livestock enterprises, cropping accounts for around 14% of farming land.⁷ The definition of resilient farming is broad so that it can encompass all agricultural land uses, however the major gains will be made by broad scale uptake of grazing and cropping farming systems as these are the dominant land uses.

An increasing amount of data is now available to show that these practices do increase soil carbon. For example a long-term cropping trial from 1979 in Wagga Wagga conducted over 20 years compared a range of cultivation practices, stubble retention and crop rotations.

The results show that under continuous wheat cropping, using the then-dominant practice of stubble burning and cultivation (3 scarifications), SOC was lost at the rate of nearly 400 kg/ha/yr. No-tillage farming preserved 169 kg C/ha/yr more than traditional tillage, whereas stubble retention saved 108 kg C/ha/yr compared to stubble burnt. A crop/pasture rotation sequestered more carbon than continuous cropping. The most carbon conserving system was wheat/subclover pasture (1:1) with the wheat under no-till and stubble retention, where SOC increased at a rate of 185 kg C/ha/yr. These long-term trial results show the importance that improved land management practices can have on SOC levels and that the right practices can turn the farming system into a carbon sink. The study found that no-till would result in a SOC level of 2.5% compared to the stubble burning cultivation approach with carbon levels of 1.5%.⁸

Carbon in soils is a proxy for the environmental health of farming systems

It is generally accepted that improving soil carbon has substantial benefits directly to soil health and productivity that accrue to farmers and the environment.

SOC is the basis of soil fertility and is important for all three aspects of soil fertility; chemical, physical and biological. Decomposition of soil organic matter releases nitrogen, phosphorus and a range of other nutrients for plant growth.

SOC is a very important component of the global carbon cycle. It is the largest component of the terrestrial carbon pools, approximately twice the amount of carbon in the atmosphere and in vegetation.⁹

If more carbon is stored in the soil as organic carbon, it will reduce the amount present in the atmosphere, and therefore help to alleviate the problem of global warming and climate change.

The importance of SOC for positive environmental and development outcomes gained recognition after breakthrough decisions at the United Nations Convention to Combat Desertification (UNCCD) in 2015. **SOC is recognised as a major determinant of agricultural productivity and water security, and it is the cornerstone of biodiversity and climate change resilience.** This importance is reflected in Target 15.3 of the Sustainable Development Goals to achieve a land degradation-neutral world:¹⁰

“By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.”

7 <https://www.agriculture.gov.au/sites/default/files/abares/aclump/documents/Land%20use%20in%20Australia%20at%20a%20glance%202016.pdf>

8 http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/210756/Increasing-soil-organic-carbon.pdf Viewed 1 August 2020

9 http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/210756/Increasing-soil-organic-carbon.pdf Viewed 1 August 2020

10 <https://www.iucn.org/theme/ecosystem-management/our-work/global-drylands-initiative/publications/technical-briefs/soil-biodiversity-and-soil-carbon-keeping-drylands-alive>. Viewed 1 August 2020

THE FARMING DIVIDEND

Increasing Resilient Agriculture practices improves farm business drought preparedness

Resilient Agriculture practices such as no-till agriculture and improved grazing management contribute to the increase in carbon content in Australian soils. Increasing the carbon content of Australian soils is a cost-effective, practical solution that helps a farm business in building drought resilience.

A 1% increase in SOC equates to about a 2% increase in water holding capacity¹¹, which can be crucial in a dry year when the availability of water during key periods of plant development can mean the difference between crops flourishing and failing.

Soil organic carbon (SOC) is extremely important for supporting the many species of soil bacteria and fungi, which boost soil health and promote sustainable increases in yields and improves performance during drought.

Dust busting agriculture

Farmers don't just rely on science and data, farmers recognise directly when an improved practice improves drought resilience. For example, the Ruwoldt family on Glenvale Downs at Minyip were one of the pioneers of no-till in Victoria.

The catalyst for change was the highly visible dust storms of the time, which were removing the exposed cropping soils following cultivation and stubble burning. The process of changing agricultural practices happened over many years and it took another drought in 2006-2007 to highlight the value of change to other neighbouring farmers.

Robert Ruwoldt explains this perfectly: "Through the good times we don't need to change, we are making money on our farms and everything is ok. But when bad times hit, it really gets everyone looking over the fence." The Ruwoldts were producing good crops throughout the droughts, when others were unable to establish crops.



11 http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/210756/Increasing-soil-organic-carbon.pdf Viewed 1 August 2020

Farmers using resilient farm practices reduces the need for government in-drought support

The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) outlines the contrast in farm business performance in its March 2020 paper “Disaggregating farm performance statistics by size”. The publication found that the largest 10% of broadacre farms produced 48% of total output, while the smallest 50% of farms produced 11% of total output. Furthermore this reflected closely the financial returns of farms, with the average rate of return including capital appreciation by the largest 10% of broadacre farms being 8.3%, while the average for the smallest 10% of farms was -4.2%.¹²

Looking at farm business profit for broadacre farms for 2017-18, the top 32% of farms in Australia made more than \$50,000. They have much more capacity to invest in their farm businesses to improve management practices and manage risks like drought.¹³

There is a clear connection between farm profitability and resource availability and the uptake of more sustainable agricultural practices. Providing affordable resources and skills to the middle tier of Australian farm businesses will increase the uptake of practices that improve drought resilience and reduce the Government’s expenditure on in-drought support. This will also increase the Government’s tax receipts, helping it fund other essential services.

Increasing resilient farm practices improves sustainability and profitability of a farm business

There is clear evidence that increasing Resilient Agriculture practices improves a farm’s profitability.

No-till farming is a good example of Resilient Agriculture, with increased profitability of crop production from higher average yields in the short term. Long term, there will be higher yields from improved soil structure and higher organic carbon soil content. Adoption of no-till farming delivers more robust cropping systems able to cope with any climatic changes and potentially higher market returns for grain that is produced under best environmental management practices.¹⁴

“For livestock enterprises especially large broad acre properties, stocking rate is the major driver of both production and environmental impacts. Moderate stocking rates give better overall performance than high stocking rates with the season having a marked effect. In a long-term trial at Wambiana, the heavy stocking rate had higher gross margins than the moderate stocking rate in above-average years but the reverse was true in poor years; overall the moderate stocking rate had a higher average gross margin.”¹⁵

¹² https://www.agriculture.gov.au/sites/default/files/documents/DisaggregatingFarmPerformanceStatisticsBySize_v1.0.0.pdf viewed 27 July 2020

¹³ <https://www.agriculture.gov.au/abares/research-topics/surveys/farm-survey-data-summary-data-table-broadacre-by-state> viewed 27 July

¹⁴ https://grdc.com.au/__data/assets/pdf_file/0020/223238/grdc_impass_wantfa1.pdf (p 3)

¹⁵ <https://publications.csiro.au/rpr/download?pid=csiro:EP112515&dsid=DS4> (p1)

Other key factors are pasture maintenance and improvement, grazing rotation and availability of shelter and water.

Carbon loading



Phil Dumaresq from Longford, Tasmania improved his prime lamb production by utilising Resilient Agriculture techniques. Existing pastures performed better with well managed and timely grazing and good soil nutrition.

“Having accurate feed budgets is a powerful tool. You know where your sheep production is tracking and it sets guidelines for the season so when pastures are not going to meet your budget, you have an early trigger to buy in more feed or reduce numbers,” he said. “This often means we have planned well in advance of requirements, securing additional feed or space at the abattoir.”

The feed budget ensures paddocks are not over grazed, maintains vegetation cover and soil conditions, secures long-term production, and produces positive environmental outcomes.

Increases in levels of soil carbon delivers substantial increases in farm profitability.

In 2018, Australian Soil Management trials showed major improvements in farm profitability through increasing soil carbon in almond and wine farming systems.¹⁶

The Grains Research and Development Corporation found that “maintaining and increasing the level of organic carbon in the soil will have benefits in terms of maximising water-holding capacity and crop productivity”.¹⁷

¹⁶ <https://www.australiansoil.com.au/single-post/2018/06/14/Increased-Soil-Carbon-Dramatically-Increases-Farm-Profitability>

¹⁷ https://grdc.com.au/__data/assets/pdf_file/0044/199898/carbon-farming.pdf.pdf

Enhancing returns from the landscape



Cavan Station is a 9,900 hectare aggregation of grazing properties straddling the limestone valley of the Murrumbidgee River in the NSW Southern Tablelands.

Successive years of droughts and depressed commodity prices prompted its management team to change the way the property was farmed.

Changes in conceptual thinking were at the heart of Cavan's transformation in the last five years. The business focus has shifted from livestock production to grass production. The performance of the landscape is recognised as the key determinant of financial performance.

Cavan adopted a data-driven approach to grazing management, matching the stocking rate to the carrying capacity of the land which is continually revised according to the level of ground cover, soil moisture and weather forecasts.

The decision making is informed by MaiaGrazing technology, a software tool that enables farmers to make confident decisions based on empirical evidence.

Investments have been made in the landscape to increase tree cover, slow water movement, restore water courses and diversify species of ground cover.

The new approach was tested by the 2017-20 drought. Throughout that period it accumulated ecological capital measured by a net increase in SOC. The financial operating performance also remained relatively strong measured by EBITDA (earnings before interest, taxes, depreciation and amortisation) relative to rainfall.

The success of the new business model does not depend on revenue from sequestering carbon.

Alasdair McLeod, who oversaw the transition, says the business model does depend on the direct monetisation of carbon.

"The business imperative was to build a drought resilience operation here, and we needed to do that to keep the business on track and indeed to keep the landscape healthy," he said.

"But the two kind of go hand in hand. Sequestering of carbon has been a byproduct of that."

If there are so many benefits, why aren't farmers taking it up?

Australia's farmers have, over many years, been at the forefront of innovation. An increasing number of farms are realising the benefits of adopting resilient land management practices. Overall however, due to a variety of reasons that impact on farmers' financial resources, the uptake has been slow.

In 2012, ABARES surveyed over 1300 farmers on land management practices and found there was strong awareness and understanding of the imperatives for sustainability, with lack of funds, and time, the main factors limiting farmers' ability to change their management practices.¹⁸

Extensive consultation with industry organisations supported ABARES' findings while recognising that the top 20-30% of farm businesses were doing fine. With increased knowledge and skills and access to more resources, the large middle tier of farm businesses would increase the speed of adaption of Resilient Agriculture farm practices.

The Government has an important role to play in driving industry change. The Federal Government's Research and Development model is the envy of many countries around the world and has been critical in providing the tools for farmers to improve practice. However, with the reduction in state funding of regional agricultural outreach services and increases in input and running costs, the adoption of improved farm practices has slowed. Governments have a role in implementing policies that encourage farmers to continue improving their farm practices. One of the key conclusions of the journal article "The development of Conservation Agriculture in Australia—Farmers as innovators" is that policy settings that empower farmers to play a more active role in the innovation system have been significant.¹⁹

On the flipside, good intentions do not always translate into good policy. Farmers want better drought resilience, farm profitability and sustainability. But poorly designed complex policies with high start-up costs can have the reverse effect; farmers hold off making change waiting for a better policy environment which will allow them to take advantage of government incentives.

In the same way, some stakeholders pointed to in-drought support programs, leading farmers to make sub optimal business decisions such as holding off destocking in the hopes of a government stock feed subsidy.

Farmers may be holding off improving farm practices that increase soil carbon because they are waiting for more simplified methods with lower start-up costs. The same applies with the farm biodiversity certification trial where farm businesses delay the adoption of practices that improve biodiversity while waiting for a policy that may provide an extra stream of income.

18 <https://www.agriculture.gov.au/abares/news/media-releases/2012/new-study-identifies-the-drivers-for-sustainable-land-management>

19 <https://www.sciencedirect.com/science/article/pii/S2095633915300113> accessed 1 July 2020.

THE ENVIRONMENTAL DIVIDEND

Improved Resilient Agriculture practices can help mitigate the impacts of climate change/variability

By definition, Resilient Agriculture practices improve soil health. Improving soil health requires an increase in soil carbon, so Resilient Agriculture practices remove carbon dioxide from the atmosphere through soil carbon sequestration.

There are two policy outcomes.

1. Increasing soil carbon which has the benefit of helping international carbon reduction and reducing the impact of climate change.
2. Counting the carbon reduction to meet our international obligations.

Certifying the amount of sequestered carbon is complex, bureaucratic and expensive and is inhibiting investment in good carbon abatement projects and slowing the uptake of practical policies that will deliver actual carbon abatement.

Resilient Agriculture practices offer a path towards achieving negative emissions for the agriculture sector, helping Australia meet its international obligations and reducing investment in other more expensive negative emissions technologies. Farmers implementing Resilient Agriculture practices that sequester carbon can access an additional income stream from selling ACCUs, or potentially international carbon credits, strengthening their ability to survive bad seasons financially.

The King Review highlighted the complexity of the system and the need to make improvements. The Government is committed to implementing most of the King Review recommendations but that will take several years and will still result in a complex system with significant start-up costs.

Furthermore, Australia's variable climate can deplete SOC levels despite improved practices in the farming sector. There is a risk under the current rigid CFI accounting methodology of creating an extra liability for farm businesses signing up to a carbon farming methodology (ie creating negative carbon credit units where SOC levels drop below base levels due to climatic conditions).

As a result, the take up of Carbon Farming Initiative (CFI) projects has been poor. Only 57 projects have been approved under two sequestering carbon in the soils project methods. Three of these have since been revoked and only one has had ACCUs issued.²⁰

This policy seeks to address the outcome of carbon sequestration through the increased adoption of resilient agricultural practices irrespective of the Carbon Farming accounting methodology and Government should fund SOC baseline measurement through a contingent loan scheme, similar to HECS-HELP. This will in turn make the transition to carbon farming projects for these businesses more attractive when the methodologies become more workable. This policy will allow for action now in carbon sequestration and will not require

²⁰ Emissions Reduction Fund project register <http://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/project-register> viewed 23 July 2020

waiting for changes outlined in the King Review to provide for more practical usable CFI project methodologies. Importantly, it provides immediate increases in carbon sequestration, delivering carbon abatement outcomes.

Improved Resilient Agriculture practices can help provide environmental certification for farm businesses

A well-designed certification scheme for food grown using Resilient Agriculture techniques would increase consumer confidence in the integrity of premium foods and offer an incentive for farmers to continue to modernise to more sustainable farming systems.

Perceptions of product integrity are becoming ever more important. For example, most asset managers have now signed up to the United Nations Principles for Responsible Investment. Companies are taking that a step further. For example, Walmart recently committed to sustainable supply chains to source 100% of seafood, bananas and pineapples, paper and pulp products from companies that are third party certified. It has also built a land conservation initiative to match its store footprint.²¹

In April 2020, CBH Group shipped 27,000 tonnes of sustainable malting barley to Vietnam from its port in Albany, attracting a \$5 premium per tonne for barley growers accredited through the International Sustainability and Carbon Certification scheme. Now, 30% of brewers are making compliance to the scheme mandatory for supply.²²

CBH is also exploring the feasibility of sourcing, certifying, marketing and distributing carbon neutral oats, barley and lupins from Western Australia. The project will consider the potential for resilient farming practices to support this goal.²³

Premium certification offers a reward to farmers for the public benefit they deliver as a result of sustainable land management.

Currently, the Government has commissioned a pilot in biodiversity certification and there is concern that good policy intent may be inhibited by bureaucratic biodiversity accounting.

21 <https://nff.org.au/programs/australian-farm-biodiversity-certification-scheme-trial/> (viewed 19 June 2020)

22 <https://nff.org.au/programs/australian-farm-biodiversity-certification-scheme-trial/> (viewed 19 June 2020)

23 <https://regenfarming.news/articles/4-2b-grain-exporter-launches-carbon-neutral-grain-pilot>

Biodiversity certification

A number of proposals have been put forward to provide mechanisms to reward farmers for their contribution to biodiversity. The Federal Government recently provided \$4m to the National Farmers' Federation to develop and trial a proposal.

SOC measurement is a reliable way to assess a farm's contribution to biodiversity, whether negative or positive. Methods that improve SOC content, like the avoidance of over-grazing and the sowing of mixed-species paddocks, make a direct contribution to biodiversity.

The retention of water in soils rich in SOC reduces erosion and silting in water catchments, creating more permanent streams and ponds that become havens for plant species and wildlife.

SOC content is the most reliable predictor of biodiversity and can be relatively easily measured. It should therefore be adopted as the key benchmark in certifying biodiversity.

RECOMMENDATIONS

By adopting Resilient Agriculture practices, farmers can improve productivity outcomes as well as environmental outcomes. These practices improve the performance of a farm business during drought, hence improving the enterprises' resilience during drought.

Measurement and certification

Recommendation 1

The measurement and certification of soil organic carbon (SOC) should be urgently reformed to make it simpler, fairer and trustworthy.

Recommendation 2

SOC content should be adopted as the principle metric in the certification of improvements to biodiversity.

A revised SOC measurement methodology should be developed to offer farmers a clear commercial incentive to change their farming practices.

Barriers to entry should be removed and compliance simplified while enhancing the integrity of Australian Carbon Credit Units.

Peer to Peer training

Recommendation 3

A capacity and capability, peer-to-peer led Resilient Agriculture skills development program should be established using existing support networks.

A capacity and capability, peer-to-peer led Resilient Agriculture skills development program will help farmers adopt improved practices and understand the benefits from the uptake of regenerative agriculture. This would fill the gaps in farmer benchmarking groups geographically and across industry groups and enhance existing groups with a focus on a holistic approach. Many existing benchmarking groups just focus on a particular farm practice such as no-till agriculture, whereas the focus of this program will be to improve the spectrum of farm business practices to improve soil health and build resilience.

This capacity building program would subsidise farmers to help build the tools to adopt resilient agricultural practices. It would also provide incentives to establish new benchmarking groups where there are gaps and strengthen existing groups.

In terms of content for a national training program, stakeholders said that promoting practices that improve soil health was critical. There was a high degree of emphasis on this issue with discussion centred on better soils, better water retention, more vegetation cover, and better, more nutritious produce for the consumer.

Loans and rural business support

Recommendation 4

A new “Resilient Agriculture” loan product should be made available through the Regional Investment Corporation with loan periods of at least five years and interest-free periods of up to five years.

Recommendation 5

The Government should expand the charter of the Rural Financial Counselling Service (RFCS) to deliver rural business support to improve farmers’ financial literacy and planning and to support access to drought preparedness measures.

A new “Resilient Agriculture” loan product would be made available through the Regional Investment Corporation to farm businesses that adopt Resilient Agriculture processes. Loan periods would be at least five years with interest free periods of up to five years.

Currently, the Government offers these type of loan products to farmers as part of in-drought support measures to help them manage financially through drought. Under this recommendation, the Government would offer Resilient Agriculture loans to reflect its policy shift from in-drought support to drought preparedness.

The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) found that farm businesses want to improve agricultural practices in order to improve environmental outcomes but are constrained by lack of resources.

Our extensive consultation with industry organisations supported ABARES’ findings while recognising that the top 20-30% of farm businesses required no assistance. The large middle tier farm businesses would increase the speed of adaption of resilient farm practices if they had access to more resources.

There were significant concerns among the stakeholders about the onerous and complex nature of loan applications through the Regional Investment Corporation. It will be important to simplify the application process and provide good support options. For example, the RFCS network and constructive work with the major banks would allow broad uptake from the farm sector.

As part of this policy shift, the RFCS charter should be modified to allow it to work proactively on business resilience. Changing the model of the RFCS to one that is similar to that of the Rural Business Support group will allow the RFCS to proactively help farmers build resilience and improve financial literacy instead of just being a support mechanism for those in financial hardship.

Baseline carbon measurement

Recommendation 6

Government should fund SOC baseline measurement through a contingent loan scheme, similar to HECS-HELP. The loan would be repayable when the yield from Australian Carbon Credit Units (ACCUs) reaches a nominated threshold.

The current expense and complexity of measuring SOC content acts as a deterrent to farmers to establish a baseline measurement against which future improvements can be certified.

Improvements in technology and data should bring the cost down to the Government's target of \$3/ha in a relatively short space of time.

In the meantime, however, any improvements to SOC content won't be captured, denying farmers incentive and potential revenue.

A HECS-HELP style loan scheme would enable farmers to bring baseline measurement forward, allowing them to bank sequestered carbon, the value of which can be redeemed once the costs of measurement are reduced.

The loan would act as an advance on future revenue received from ACCUs with repayments made as a fixed percentage. As with HECS-HELP, there is no obligation to repay the loan if the threshold for repayment is not reached.

The King Review identified subsidised carbon measurement as a possible way to deliver more efficient measurement.

Carbon sequestration and biodiversity both depend on increasing the levels of organic carbon in the soil. This Resilient Agriculture policy is designed to deliver carbon abatement and biodiversity outcomes through practice change without burdensome bureaucratic systems for quantifying the increases in carbon. The addition of baseline carbon measurement to this policy is critically important for a number of reasons:

- It provides the farm business with an understanding of where they are at in terms of SOC and the scope for improvement.
- It provides an important mechanism for transition to carbon farming initiative projects and gaining credit for increasing soil carbon.
- It provides the opportunity to transition to a biodiversity certification scheme and gain credit for improvements to biodiversity that does not lock away land, thus helping to overcome the deficiencies of native vegetation laws.
- It provides farm businesses with that extra incentive to adopt resilient agriculture practices, diversify revenue sources and improve profitability.
- Subsidising measurement costs in return for sharing information will also help resolve scientific uncertainties and support the development of cheaper, more efficient measurement methodologies. This will benefit the Government through allowing greater uptake and greater environmental outcomes.

As the King Review outlined:

“An alternative approach is to proceed with a measurement-based method and subsidise proponents’ measurement costs on the proviso all data are shared to help resolve relevant scientific uncertainties and support the construction of suitable models. This lowers the costs associated with obtaining the relevant scientific data needed to construct the model-based method. It also reduces the delay in the uptake of the abatement activity by lowering the measurement costs borne by proponents.”²⁴

This would complement and work hand in hand with the ‘Australian Agriculture Soils Initiative’ project that seeks to invest in a research project to improve measurement techniques and implement the King Review recommendations. Research is currently underway for better measurement techniques and improvements are being made in carbon sequestration methodologies. Implementing this project now means the Government can deliver outcomes sooner and avoid delaying improvements in farm practices which increase the levels of soil carbon.

²⁴ King Review p 50

APPENDIX

An important element in the development of this policy paper was engaging with, and listening to, a wide range of stakeholders.

These included: The National Farmers Federation, NSW Farmers Association, Victorian Farmers Federation, AgForce (QLD), Tasmanian Farmers and Graziers Association, Primary Producers of South Australia, WA Farmers, Cattle Council of Australia, Rural Research and Development Corporations, AusVeg, Banking representatives, Rural Financial Counselling Service, Resource Consulting Services and Corporate Carbon.

Discussions were also had with the Offices of the Minister for Energy and Emissions Reductions and Minister for Agriculture, Drought and Emergency Management.

A policy outline was distributed prior to each meeting outlining the approach to change current policy settings to increase the adoption of Resilient Agriculture techniques. The outline centred on an approach of offering commercial incentives to farmers that are simple, fair and transparent in order to create a more resilient, productive agricultural sector.

In each of these meetings, the Menzies Research Centre outlined that the policy proposal was focused on helping the middle tier of Australia's farmers become more resilient, environmentally sustainable, productive and profitable.

Stakeholders overwhelmingly supported the principle of policies to improve farm practice and improve resilience.

Feedback for a 'peer to peer' training program was extremely positive. There is broad support for a program that supports farmers in becoming better, more profitable land managers and that a 'best practice' type training program is needed as a matter of urgency. Based on the feedback received, it is highly probable that the NFF, state-based farming organisations and major agricultural commodity groups would support and promote this initiative.

The establishment of more grower-led groups around Australia was evidence that farmers are proactively seeking to benchmark themselves against best practice land management. It was also evident that this approach was more prominent in the cropping sector than in the grazing industry.

Most felt that working at the coalface with farmers on a continuous improvement program was much needed. Many consultants mostly work with the top tier 15-20% of farmers. It was further noted that the programs that currently exist are not specifically targeted and that focusing on the middle tier of farmers was important as their margins and profitability is currently low and there is significant upside to this type of policy.

In terms of content for a national training program, stakeholders said that promoting practices that improve soil health was critical. There was a high degree of emphasis on better soils, better water retention, more vegetation cover and better, more nutritious produce for the consumer. It was important to provide evidence that the training program would impact a farmer's bottom line positively.

Any program that is developed must be proactive and not reactive and is focused on delivering benefits to the future productivity and therefore profitability of Australian farmers. One consultant suggested that promoting better land management practices needs to be considered with other farm management issues such as financial and business planning, succession planning and managing biodiversity.

Each major agricultural commodity group has grower groups, but the general view is that there is potential for improvement through collaborating more with farmers/trainers who have the relevant best practice expertise.

A number of stakeholders acknowledged the demise of state government funded extension services and said a peer-to-peer training program is a common sense, practical way of filling the void. Some challenges identified by stakeholders was the ability to disseminate the information on better practices as far and wide as possible and that there may be some state based regulatory challenges that mean a more holistic approach should be adopted.

To overcome the issue of program delivery, a number of stakeholders emphasised the importance of working within existing grower networks, the Landcare network and the RFCS network. 'Do not reinvent the wheel' was a term commonly used. These types of networks have built an element of trust so the policy should capitalise on this.

In terms of funding the peer-to-peer training program, it was felt that agri-business, as well as government, may be interested in supporting an initiative that increased profitability and reduced risk. At least one major bank is looking at ways to incentivise their farmer clients to adopt more sustainable management practices because, as farm properties become better managed and more resilient, the risk profile lowers. They acknowledged changing climatic conditions was a large part of their thinking at present.

Stakeholders in general supported a financial incentive scheme and agreed it was important to provide proactive policies that allow farmers to prepare for drought and not just reactive in-drought support loans. Some stakeholders believed that the take up of "just another" loan scheme would be low and that arduous application processes were a deterrent to those wanting to access government funding initiatives.

Stakeholders acknowledged that the Rural Financial Counselling Service was important in helping farmers with application processes and that the RFCS could be important to the success of a loans program. Financial literacy amongst the farming community still has much room for improvement according to many stakeholders and more emphasis should be directed at fixing this problem.

Several stakeholders raised the idea of expanding the scope of the RFCS from a reactive in-drought support network to a proactive business support network that helps farmers in improving their resilience. This would be similar to the Rural Business Support organisation, which delivers the RFCS in South Australia and the Northern Territory alongside other services and programs that inspire farmers and rural small business owners to take action to improve their financial position. This model does not just help those in need but allows farmers to be proactive in building resilience. It also removes the stigma for farmers using the service of being seen to "need their support".

Stakeholders outlined a number of other contributing factors that were considered in the development of this policy. These included:

- Succession planning problems can stall farm innovation, while loss of farm scale due to family dispersal can make farm size less viable.
- States with less reliance on in-drought support felt their farmers were more resilient and were adapting and innovating quicker and there was a quicker consolidation of farms to ensure viability. This is also supported by ABARES' farm survey data finding 52% of broadacre farms in WA and 66% in the NT making more than \$50,000 profit compared to the national average of 32%.²⁵
- Farmers in states with high environmental regulatory burdens were slower to improve practice due to the extra financial constraints involved in doing so.
- Queensland and NSW already have programs (the \$500 million Land Restoration Fund and Farm Innovation Program, respectively) to help farmers change practice. Our policy should take account of and complement them.

²⁵ <https://www.agriculture.gov.au/abares/research-topics/surveys/farm-survey-data-summary-data-table-broadacre-by-state> viewed 27 July



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