Carbon Farmers of Australia

Submission to the Senate Standing Committee on Environment and Communications Legislation Committee

26 June, 2014

This Submission contains evidence on the following matters:

- The impact and operation of the Carbon Farming Initiative amendents on existing land sector project and changes to research and development.
- The role and operation of Australian Carbon Credits in a grant based system.

"Land Under Contract"

A landholder who wants to take advantage of the Carbon Farming Initiative's soil carbon offsets must sign a contract which requires that the new enhanced levels of carbon for which they are being rewarded remain for 100 years. There is a 25 year option. Either way it is a significant commitment.

This paper argues that there are major benefits for Australia and Australians that as much of the nation's farmland as possible should be 'under contract' to boost soil carbon levels and retain them as long as possible.

There are three fundamental principles that support the Carbon Farming promise:
1. A Change in Farm Soil Management can have a critical impact on Global Warming.
2. A Change in Farm Soil Management can have a critical impact on Landscape Health and Drought Readiness.
3. A Change in Farm Soil Management can have a critical impact on Rural Economics.

It can help solve our Soil/Food Crisis, our Climate Crisis and the Crisis of the Decline of Rural Communities. Each of these issues has been misunderstood and misrepresented by many commentators and vested interests. The results of these misunderstandings can be seen in the following aspects of the emerging Emissions Reduction Fund (Direct Action): 1. No Banding – the co-benefits of increased carbon are not recognized in the ERF trading mechanism. 2. Small or Modest Contribution – the potential of soils to capture and hold increasing amounts of carbon has been misdiagnosed. 3. Lowest Cost Abatement – the price offered by the reverse auction too low to attract sufficient landholders to meet the objectives of the program.

A carbon-rich soil is an asset of immense value. It reduces the need for inputs such as synthetic fertilisers. It resists erosion. It can hold large amounts of water long enough for it to maximize growing opportunities. It is healthy soil. It encourages the growth of fertile top soil. It is genuinely sustainable. Every sequestration project requires that the carbon-rich asset be maintained for the period that it is under contract. Minister for the Environment Greg Hunt says the nation should aim to have as much soil under contract as possible: “This once in a century replenishment of our soils also offers the potential to improve soil quality, farm productivity and water efficiency, and should be a national goal regardless of the additional CO2 abatement benefits.”

Soil is being lost in Australia at a rate 5 times faster than it can be replaced through natural processes, according to Sydney University’s Professor John Crawford. He gives some countries 60 years before soils become functionally dead. Topsoil – the nutrient rich zone where roots flourish – is disappearing into waterways and into the air due to poor soil management, leaving the farmer to grow crops in low-nutrient subsoil.

Not only has soil volume been lost. The nutritional value and structural soundness has been reduced with the loss of 75% of soil organic matter since white settlement. The CSIRO has outlined the dangers of these losses for crop and pasture production: “The depletion of soil organic matter has numerous adverse ecological and economic consequences:

- depletion of plant nutrients;
- loss of aggregate structure;
- decreased water-holding capacity;
- increased surface erosion;
- a decline in soil biological activity and diversity; and ultimately

• declines in crop yields and quality."

These events will be exacerbated by droughts, predicted to be longer and more intense in many regions in Australia. By increasing carbon levels in the landscape, farmers can build resilience into their systems. Carbon farmers go into drought later and come out of drought sooner than conventional farmers.

Only the widespread adoption of Carbon Farming practices can reverse soil losses, regenerate the productive power of our soils and prepare the landscape for even tougher times ahead. And protect the infrastructure our society relies upon to feed and clothe itself.

The Economics of Soil Carbon

"The Emissions Reduction Fund will be designed to achieve lowest-cost emissions reductions as its primary objective." The economics of Soil Carbon Sequestration is different from the economics of Avoided Emissions. The science is more complicated, the regulation more onerous, and the risks greater. The cost base is higher. It cannot compete in a race to the bottom on price. Swapping light bulbs or some other substitution will always win. If "lowest cost emissions reduction" and "source neutrality" prevail, Soil Carbons will be shut out of the Carbon Farming Initiative.

There is an important difference between emissions extraction and emissions avoidance. Soil Carbon Sequestration offers important co-benefits that enable a proposition to attract a higher price in commercial markets. It offers a "once-in-a-generation opportunity to recapitalise our soils." It enables us to tackle our soils crisis. Failure to recognise the special circumstances of soil carbon would set the value of the essential environmental services that farmers would perform by restoring carbon in their soils at zero.

Drought Solution

The severity and frequency of droughts has increased since Federation, as can be seen on the ABC's Drought Timeline. They will continue to increase. Farming for soil carbon is the most effective adaptive strategy available for agriculture.

http://www.abc.net.au/news/rural/specials/drought-timeline/#15

Growing carbon in your soil is the most important part of getting your farm prepared for drought, according to one Carbon Farmer: "Rather than waiting for the rain to give us the feed we need tomorrow, the rain we get today is

growing our feed for 150 days away," says organic beef and lamb producer, John Walker, from the Monaro in south east NSW. He has 60 paddocks where a conventional farmer would have six. "We put all our mobs together and leave them on one paddock for three to ten days and then move them on. It means that our paddocks get 150 days rest, between grazing." That rest is growing time for plants and for the carbon in the soil. "We basically do everything we can to preserve carbon in our soil." John Walker is an "outlier" – a data point at the end of the curve. One of a small group of innovative farmers who have taught themselves how to restore soil's natural capacity to be productive. They focus on the soil, not the animals. It is a mindset.

"We've got to clone them," says CSIRO's top soil scientist Dr Jeff Baldock.

Emissions Extraction: Better Than Avoidance

The cause of the extreme weather events is NOT the Greenhouse Gases (GHG) nations are arguing about as they try to agree on how to curb future emissions. The gases doing all the damage are already in the atmosphere, some released more than 100 years ago. We call this "the Legacy Load". Many scientists have recognized that it exists. "The carbon dioxide that's in our atmosphere today – even if we were to stop emitting it tomorrow – would live for many decades, centuries and beyond," said Dr Susan Solomon, senior scientist of the of the Global Monitoring Division of the U.S. National Oceanic and Atmospheric Administration. Britain's Chief Scientist said that, "even if humanity were to stop emitting carbon dioxide today, temperatures will keep rising and the impacts keep changing for 25 years."

Neither governments nor scientists have a plan to deal with the Legacy Load because they focus entirely on future emissions. The 'vintage' CO2 that is doing all the damage cannot be captured by "clean coal" technology and immobilized by geosequestration, or Carbon Capture and Storage (CCS). Nor is it the CO2 that will be avoided when power is generated by solar or wind turbines or thermal or nuclear power.

The damage is being done by GHG that can't be captured at source or substituted. It has to be scrubbed out of the atmosphere by the only means possible: by the natural processes that lock carbon up in trees and soils: Photosynthesis. When Climate Change stops being a long-term problem and becomes an emergency, governments will have options: forest plantings and Biochar. But while both have important roles to play in the mid-to-long-term, nothing can compete with soils in short term (20-30 years) impact on 'stalling' Climate Change, the reason the IPCC was formed.

“Soil Carbons” Heavy Lifting

The new Abbott Government promised, while in Opposition, to make “soil carbons” a central plank of its platform for addressing climate change. This is not a recent conversion. Environment Minister Greg Hunt announced that he had a “Soil Carbon Vision” in 2008. He tenaciously held firm with his belief that soil carbon can make a significant contribution to carbon draw down. Critics point to “the science” which estimates that Australian farmers can expect to sequester minimal amounts of carbon in Australian soils under Australian climate conditions. But the rate and quantum of sequestration has been under-estimated to date due to the practice of studying the performance of practitioners of management techniques without regard to their skill level. When the focus is upon the high-performance land managers the “potential” – as in the best results recorded – sets the bar much higher than most studies to date. Soil tests show that Cam Banks of Lakeview, Uralla has `built’ over 2t carbon/ha/year or sequested 7.8t/ha/year of CO2 – over 20,000t in the last 5 years. But Cam and farmers like him are officially invisible. They are ‘outliers’. Their data is removed from the data sets as a matter of course.

One astonishing finding from the largest scientific study of soil carbon demands a rethink of how such research is structured. The 3 year Soil Carbon Research Program cost more than $24m. The researchers had divided thousands of farmers into groups based on the management practices they followed and their region, and looked at their soil carbon levels. After analyzing 20,500 samples from 4500 locations, the largest soil sampling exercise in Australia’s history revealed that no practice was any better than any other at improving carbon levels in soil. No grazing method or tillage practice stood out.

Some drew the conclusion that a farmer’s management style makes no difference. But Dr Yin Chan, when Principal Research Scientist (Soils) NSW DPI, studied historical change in SOC as a result of management practices, showing soil carbon sequestration potential. “In agricultural systems, soil carbon levels tend to be variable and dependent on management practices.” He said that it took 50 years to destroy the soil carbon stocks by conventional tillage. (“Increasing soil organic carbon of agricultural land”, DPI/NSW Primefacts January 2008.)

The knowledge has been available to Australia's farmers for 30 years, in the form of extension programs and commercial training packages. But it will take a shift in the culture of land management before we see widespread adoption of these practices.

Government can force farmers to adopt drought resistant soil management by making it a condition for short-term drought funding. Or it can allow farmers access to the incentive of soil carbon credits by giving special status to soil carbon.

Soil Carbon Potentials

The most astonishing finding of the Soil Carbon Research Program was that no particular management practice outperformed the others, and none performed consistently across all regions.[1] But the researchers have realised that there was an ingredient missing: the skill level of the farmer in the management practice. That skill level could be directly related to the length of time the practitioner has been practicing. Every successful practitioner will tell you that it can take several years to get their system right. It is not a matter of simply applying a 'practice' to an area of land to get a standard, repeatable response. Overlooked in the first analysis were a group of "high performance" soil carbon managers who have demonstrated a potential well beyond the average. These 'outliers' present a challenge for the conventional estimation of the potential of Australian soils to sequester carbon. If these outliers can do it, it can be done. The CSIRO's chief soil carbon scientist Dr Jeff Baldock discovered the "Soil Carbon Outlier Effect". He suggested we study high performance individuals and what characteristics they share.

CSIRO soil scientists say the largest increase possible in Australian soils that they have recorded is half a tonne per hectare per year. But Carbon Farmer David Marsh from Boorowa NSW averaged an increase of more than 3 tonnes of carbon per hectare per year over 10 years. Carbon Farmer Craig Carter from Willow Tree NSW has added 8 tonnes of carbon per hectare per year over 3 years at his best monitoring sites. David sat on the Board of his local Catchment Management Authority and Craig is a member of the Liverpool

[1] "No individual management practice has the same influence on soil carbon stocks across all agricultural regions. And significant differences in soil carbon stocks often were not detected despite strong variations in management practices." Dr Jeff Baldock of CSIRO, *Australian soil carbon stocks: a summary of the SCaRP program results*.

Plains Land Management and Sydney University Faculty of Agriculture, Food and Natural Resources 'CANEn' project – Connecting Agriculture, Nutrition and Environment. He was also selected to be featured in former Governor-General Major General Michael Jeffrey's Soils For Life program. David Bruer of Temple-Bruer Vineyards at Langhorne Creek (SA) increased average soil carbon levels by 2% in 10 years to 2011 (more than 3 tonnes of carbon per hectare per year). David is a Climate Kelpie, part of a collaborative program between the Australian Government, Meat and Livestock Australia, Dairy Australia and the Grains Research and Development Corporation. The project aims to highlight information and tools for managing climate risk on farm.

Col Seis increased soil carbon by 3 tonnes per hectare per year (from 2% to 4%) on "Winona", Gulgong, between 1995 and 2005. Between 2008 and 2010 his sequest-ration rate was close to 9 tonnes of carbon per hectare per year. Col is co-inventor of the practice known as Pasture Cropping. He is one of Major-General Michael Jeffrey's Soils For Life farmers.

New England grazier Cam Banks has used cell grazing and a focus on soil health to achieve an increase of 2.6 tonnes of Carbon sequestered /ha/yr between 2007-2011 at "Lakeview" in Uralla NSW. Martin Royds moved his soil carbon levels at "Jillamatong" near Braidwood NSW from 3% to 7% in 5 years, lifting his tonnage per hectare from an increase of 2 tonnes per year to more than 14 tonnes per year at his best monitor points in that time frame. He was awarded National Carbon Cocky of the Year 2011, sponsored by Ylad Living Soils. Rhonda Daly and her husband Bill are also Carbon Farmers at Young NSW. They have compared a compost mineral blend vs single super, and observed an increase of 0.5% in soil carbon vs 0.07% increase between 2008-2010 - or close to 2.5 tonnes of carbon per hectare per year in a cropping enterprise.

Why is there a vast gap between the performance predicted by scientific models and the actual performance of many carbon farmers? Could the farmers be fudging the figures? But what motive would a farmer have to skew their carbon scores? No one is offering to pay them for it. No carbon trading scheme pays for past performance. Most of the farmers featured above started measuring their carbon levels 10 years ago, before there was a hint of earning carbon credits.

CSIRO's Dr Jeff Baldock, who managed SCaRP., says the soil sampling was not conducted to quantify sequestration of carbon in soils. "The three year duration of the study would not allow estimates of carbon sequestration to be

derived with high certainty. The samples therefore are a baseline measurement of the soil carbon stocks within the various combinations of soil type by management regime within each agricultural region," he says.
"Differences in the way individual landowners implement practices in response to personal preferences or business requirements may also contribute significantly." He points to a case study where the water use efficiency of continuous cropping systems ranges from 60% to 90% across a region due to landowner abilities and preferences. "Under these conditions, differences in the input of carbon to a soil will result and soil carbon values will vary even under similar soil, climate and topographic conditions."

There is no direct evidence of the potential performance of carbon farmers except that provided by the farmers themselves.

The skills and experience of the carbon farmer can be cloned and their adoption incentivized by soil carbon credits.'

Land Under Contract

Land Under a CFI Contract guarantees CO2 extraction from the atmosphere has taken place. It guarantees that food producing soils are healthier and less prone to erosion. It guarantees that water efficiency is maximized. It guarantees the soil has the best chance to respond quickly to drought-breaking rains.

Land Under a CFI Contract can help secure the future.

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By Farmers, For Farmers, With Farmers

Independent Advice: Carbon Farmers of Australia offers Growers independent advice based on long experience. CFA offers advice on Trading, Programs, Contracts, Suppliers, Legislation, and Carbon Farming. **Education & Training**: half-day, 1-day and 2-day programs can be tailor-made for your purposes. **Aggregation**: The 'aggregator' assembles tradable amounts by combining units from several Growers wishing to enter the widest range of markets. These services include registration, pool management, insurance, dispute resolution, and price advice. **Credentials**: The Principals of Carbon Farmers of Australia have been pioneers in the farm-based carbon offsets industry. Experience counts.

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