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Joint Submission to the House of Representatives Climate Change, Environment and the Arts Committee Inquiry into the Carbon Credits (Carbon Farming Initiative) Bill 2011

The benefits of soil carbon sequestration to the community and the environment are of such a magnitude that to allow accounting rules to deny us them is a perverse outcome of an equal magnitude.

Introduction

Both the Commonwealth Government and the Opposition should be applauded for the positive approach taken to Agriculture in their Climate Change strategies. Carbon Farming is a complex issue. But hidden within this complexity is a mechanism that offers a multiplicity of benefits: climatic, environmental and community.

Unfortunately, the Carbon Credits (Carbon Farming Initiative) Bill 2011, in its current form, would stand in the way of this opportunity. It has provisions that will defeat the intention of the legislation, if enacted.

Despite the Government's stated desire for broad involvement in the Carbon Farming Initiative, the Bill puts several blocks in the way of farmer involvement:

• The Permanence requirement puts such risk on the individual farmer that few are likely to get involved.

• The Additionality requirement has the potential to exclude more than half the number of farmers in any district from earning offsets, especially the Landcare farmers.

• The Measurement regime is likely to cost more than the potential value of the offsets because the scientific community demands that the degree of accuracy required for trading purposes is higher than that required for scientific enquiry.

Each dilemma will be addressed below.

Summary of Recommendations

The Carbon Farming & Trading Association recommends that the Government extend its policy of giving Agriculture special status in Climate Change policy to grant special status to soil offsets on the grounds that the benefits to the community and the environment are of such a magnitude that to allow accounting rules to deny us them is a perverse outcome of an equal magnitude.

We recommend that a special class of offsets for soil carbon be defined that will enroll as many farmers as possible to sequester as much carbon as possible as fast as possible.

We recommend that, to meet that objective, the 100 year rule be replaced by a range of time frames to allow flexibility.

We recommend that the environmental definition of additionality be adopted, by which all carbon added above the baseline is deemed additional.

We recommend that the common practice test for additionality be abandoned because it contradicts the objective outlined above.

We recommend that the 'business as usual' rule, which penalizes Landcare farmers and other progressive landholders who have taken up carbon farming techniques early and rewards laggards who continue to degrade their soils.

We recommend that the offset unit be initially offered on the domestic voluntary market as an interim measure while measurement and other issues are resolved.

We recommend that the Australian Government expand the ambit of its campaign within the IPCC to have the need to account for non-anthropogenic emissions deleted from Article 3.4 into a broader initiative to fashion a regime sympathetic to sectors subject to biological cycles such as Agriculture.

Intention of Legislation

The Objects of the Legislation are welcome – 1. meeting Australia's Kyoto liabilities for emissions reductions, 2. launching a market for farm-based offsets, and 3. regenerating farm landscapes. But we urge the legislature to set its sights higher, to the most compelling reason for the Carbon Farming Initiative: the short term, make-or-break role of soil carbon as 'a bridge to the future', as depicted by the world's most eminent soil carbon scientist, Dr Rattan Lal[1].

Lal and his colleagues believe that carbon farming can stall Global Warming: *"The technical potential of carbon sequestration in world soils may be 2 billion to 3 billion mt per year for the next 50 years. The potential of carbon sequestration in soils and vegetation together is equivalent to a draw-down of about 50 parts per million of atmospheric CO2 by 2100."*[2] This would enable mankind to keep CO2 levels below 450 parts per million and consequently hold global mean temperature from rising through the dangerous 2°C level. Dr Lal declares that

[1] See Appendix 1: Professor Rattan Lal
[2] RATTAN LAL, "The Potential for Soil Carbon Sequestration" in Agriculture and Climate Change: An Agenda for Negotiation in Copenhagen, International Food Policy Research Institute, 2009.

this process is immediately available, requiring a low cost change in land management practices across the world's 5 billion hectares of farm land. *"C sequestration in terrestrial biosphere (e.g., forests, agricultural soils) is considered a low-hanging fruit, a win-win strategy, and a bridge to the future until low-C or no-C fuel sources take effect."*[3]

Lal's declaration is supported by America's most prominent climate scientist, NASA's James Hansen who said: *"A reward system for improved agricultural and forestry practices that sequester carbon could remove the current CO2 overshot… A 50ppm draw down via agriculture and forestry practices seems plausible."*[4]

Australian scientists are recognising that the world has no credible alternative in the short term. The Wentworth Group of Concerned Scientists declared: *"It will be next to impossible for Australia to achieve the scale of [emissions] reductions required in sufficient time to avoid dangerous climate change unless we also remove carbon from the atmosphere and store it in vegetation and soils."*[5]

The CSIRO acknowledges the phenomenon: *"[W]hat [soil carbon sequestration] actually gives us is time to make those adjustments," according to the CSIRO's Dr Michael Battaglia.*[6]

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[3] RATTAN LAL, Editorial / Soil & Tillage Research 96 (2007) 1–5

[4] Hansen, J., Mki. Sato, P. Kharecha, D. Beerling, R. Berner, V. Masson-Delmotte, M. Pagani, M. Raymo, D.L. Royer, and J.C. Zachos, 2008: Target atmospheric CO_2: Where should humanity aim? *Open Atmos. Sci. J.*, **2**, 217-231

[5] WENTWORTH GROUP OF CONCERNED SCENTISTS, Inquiry into Soil Carbon Sequestration in Victoria, Environment and Natural Resources Committee, Parliament of Victoria, September 2010

[6] DR MICHAEL BATTAGLIA, THEME LEADER, SUSTAINABLE AGRICULTURE FLAGSHIP, CSIRO, Inquiry into Soil Carbon Sequestration in Victoria, Environment and Natural Resources Committee, Parliament of Victoria, September 2010

The core benefit of Carbon Farming – that makes it unique and vital to our future – is sequestration. But the side-effects of this process are many and all of them are beneficial.

An FAO-sponsored gathering of prominent scientists and practitioners which the Carbon Farmers of Australia attended in 2008 listed 21 co-benefits of conservation farming.[7] These include increased soil health and productivity for food security, more efficient use of water, increased biodiversity and environmental resilience, healthier rural communities and stronger regional economies.

Policy Considerations

The Carbon Credits (Carbon Farming Initiative) Bill could be the greatest piece of land reform legislation in Australia's history. Before this Initiative, many farmers have been encouraged by market distortions to 'flog' the land, over-grazing it and exposing it to the elements by plowing and poisoning vegetation. This Bill promises to use market forces to encourage farmers to reverse that trend and restore the soil.

Ever since the first plow bit into the virgin soils of the colony – which explorers reported were rich and healthy – 50% of our topsoil has gone with the wind. It has taken 200 years to reduce our soil carbon levels by 75%.

[7] Appendix 2: Co-benefits of Soil Carbon Sequestration

Productive topsoil from the nation's foodbowl disappears five times faster than we can replace it, according to Sydney University's Professor John Crawford. We lose 13 tonnes of soil for every tonne of wheat we grow.

Carbon Farming and Offset Trading could save the nation more than $4bn annually.

For instance, the full economic costs of dryland salinisation have been estimated at $1bn. The Institute of Foresters of Australia estimated that, for every dollar dryland salinity cost, water and wind erosion cost $5, soil acidification cost $25, soil structural decline cost $125, and soil nutrient degradation cost $625.

Soil Carbon Sequestration will reverse these outgoings and restore the productive capacity of the soil upon which all human life depends.

Barriers to trade

Despite its potential role as a bridge to a low carbon future and all the co-benefits, Soil Carbon Solution faces institutional barriers to being traded as an offset. These barriers can only be understood in the light of history: The creators of Kyoto were more at home with the concept of avoiding emissions that sequestration. Agriculture was seen through the lens of emissions to be a major source of emissions. The science used to establish the Australian National Greenhouse Gases Inventory focussed on the ways in which soil lost carbon after clearing, ie. emissions. Sequestering carbon in soil was not a process much studied by government departments (a) because it isn't a problem and (b)

because 'Carbon farming' was a fringe activity, not expected to become mainstream.[8] Therefore the National Carbon Accounting System did not recognise that Carbon farming existed and the view developed that Australian soils were too ancient and degraded to sequester carbon in significant amounts.

To be included in the cap and trade system – which was designed for 'avoided emissions' – biosequestration was made subject to a set of "integrity standards" to bring it into line with 'avoided emissions' as a quality offset.
These integrity standards - Permanence, Additionality and Measurement, as interpreted – form institutional barriers to the trade in soil carbon offsets.

Permanence

The farmer must guarantee to keep the carbon in the soil for 100 years, under the Permanence Principle, an "Integrity Standard" enshrined in the Bill. (Part 7, Div. 1, clause 87 (1); Part 9, Div. 3, clause 133 (f)). The Permanence Principle was developed for biological sequestration on the grounds that some or all of the carbon removed from the atmosphere may ultimately return to the atmosphere. This has led to the idea that offsets based on 'avoided emissions' are of superior quality to those based on sequestered carbon because buyers can be more confident that the abatement they represent is 'real'. But a close look at 'avoided

[8] AUSTRALIAN GREENHOUSE OFFICE, "Estimation of changes in soil carbon due to changed land use" (National Carbon Accounting System technical report ; no.2) November 1999

emissions' reveals that they are as robust as soil carbon sequestration.

"Avoided emissions" usually involves reduced use of fossil fuels. It is assumed that if a tonne of fossil fuel is not used, its emissions are avoided forever. However that unburned fossil fuel may still be mined and burned later. In fact, a tonne of avoided emissions today will almost certainly mean higher emissions in the future because the price of fossil fuel will be lower as these inexpensive resources will still exist. The idea that avoided fossil fuel emissions today are avoided forever is based on a fiction.[9] Either the Permanence Principle applies to avoided emissions – the seller guarantees that the coal or oil will not be burnt for 100 years – or the requirement should be removed from soil carbon sequestration.

Throughout 15 workshops with Australian farmers on the subject of offsets trading, conducted by Carbon Farmers of Australia during 2010 and 2011, not one farmer was willing to commit to 100 year contracts. Therefore, to deliver the critical benefits that soil carbon offers, soil carbon offsets cannot be evaluated by the same criteria as used for avoided emissions.

Soil carbon offsets represent real abatement: they are purpose built to play a unique role in the global strategy to manage Climate Change for least impact. They also represent a significant value proposition for buyers in terms of the co-benefits they generate. (See Figure 1.)

[9] HOWARD HERZOG, KEN CALDEIRA and JOHN REILLY, AN ISSUE OF PERMANENCE: ASSESSING THE EFFECTIVENESS OF TEMPORARY CARBON STORAGE

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Carbon Offsets Value Proposition

Avoided Emissions	Soil Carbon Sequestration
1 tonne CO2 not emitted today	Approx. 1 tonne CO2 removed†
	Improved Soil Health
	Reduced Erosion and Soil Loss
	Improved Water Efficiency
	Increased Biodiversity
	Buffer Against Drought
	Increased Production
	Increased Farm Family Incomes
	Food Security
	Secure Bridge To The Future

Fig. 1: sIt is often stated that only offsets grounded in robust science would command consumer confidence and healthy prices. Soil Carbon Sequestration does not have the support of 'peer-reviewed science' at present, due to a lack of interest among scientists until recently. However considerable support has been voiced for the benefits listed here by the most senior and respected soil carbon and climate scientists. Let the market decide.

*No guarantee that it will not be mined and burned in future.
†No guarantee to hold it for 100 years.

Precedents other than 100 years

Various accounting systems for carbon sinks have entertained periods other than 100 Years before this. "*Carbon accounting methodologies have been devised especially for sinks projects, taking into account the technical differences in relation to other types of emission reduction projects," according to a 2002 Winrock report for the US EPA.*[10]*. "The treatment of permanence, therefore, influences and is influenced by the choice of carbon accounting methodologies, the timeframes chosen for carbon accounting, and the approach chosen for dealing with liabilities (i.e., the need to return or replace carbon credits if carbon is released to the atmosphere.")*

There are IPCC precedents for accounting periods of 20, 30 and 60 years. The Milan conference of the UN Framework Convention on Climate Change established two types of emission offsets under the Clean Development Mechanism (CDM), valid for afforestation and reforestation activities. 'In order to account for the non-permanent nature of carbon storage in forests, these credits expire after a predefined periods, after which the buyer needs to replace them.[11]

[10] Louise Aukland and Pedro Moura Costa, Review of methodologies relating to the issue of permanence for LULUCF projects, Winrock International/EPA, October 2002

[11] Two types of expiring certified emission reductions (CERs) emerged, namely "temporary CERs (tCERs)" and "long-term CERs (lCERs)" For both types of expiring CERs, there is the choice between one single crediting period, with a non-renewable baseline of a maximum of 30 years on the one hand, and a baseline of a maximum of 20 years, which then can be revised and renewed up to two times. Thus, up to three consecutive crediting periods, summing up to a maximum of 60 years, are achievable for AR projects. Michael Dutschke, Bernhard Schlamadinger, Jenny L. P. Wong, and Michael Rumberg, Value and Risks of Expiring Carbon Credits from CDM Afforestation and Reforestation, Hamburgisches Welt-Wirtschafts-Archiv (HWWA), Hamburg Institute of International Economics, 2004

The Verified Carbon Standard (VCS), the most widely used carbon accounting standard among projects issuing credits in the voluntary market, allows for a period of 25 years. Redd Forests, the Australian based carbon project developer, has achieved validation of its Tasmanian Improved Forestry Management projects that avoids the emissions of greenhouse gases resulting from the logging, chipping and pulping of the timber into short-lived paper products. Instead the forests will be protected and managed by their owners for 25 years.[12]

Equivalence Method

An IPCC Special Report on Carbon dioxide Capture and Storage reveals another example of such an approach in the "tonne-year alternative for accounting" that defines an artificial equivalence so that capture and storage for a given time interval (for example, t years) are equated with permanent storage. Typically capture and storage for one year would result in a number of credits equal to 1/t, and thus storage for t years would result in one full credit. A variety of constructs have been proposed for defining the number of storage years that would be equated with permanent storage. "Despite being based on scientific and technical considerations, this equivalence is basically a political decision."[13]

100 Years: a political construct

"This 100 year timeframe is a policy-determination, not a

[12] Redd Forests, PROTECTING THE DEVIL'S FORESTS, Tasmanian forests saved and private landowners rewarded, Press Release, 4 April, 2011
[13] IPCC Working Group III, Mitigation of Climate Change, Carbon Dioxide Capture and Storage.

technical one," reveals an EcoSecurities report.[14] It is a period chosen by the IPCC for calculating the Global Warming Potential of each different Greenhouse Gas compared to CO2. For instance, Nitrous Oxide has a GWP of 298 (ie., one tonne of N2O is equivalent to 298 tonnes of CO2).

Some believe that 100 years is the time it takes for a tonne of CO2 to degrade in the atmosphere. It is not. The EcoSecurities analysts calculate that removing a tonne of C O2 and holding it for 55 years is sufficient to counteract its effect on Global Warming. The IPCC uses 20, 100 and 500 year periods in much of its analysis. "The Kyoto Protocol set the time horizon against which [GWPs] are to be determined at 100 years (addendum to the Protocol, Decision 2/CP.3, para. 3).[15] To be consistent, it can be implied therefore that the Protocol also requires the benefits of sequestration in counteracting the radiative forcing effects of CO_2 emissions to be evaluated over a 100 year time horizon. Any uncertainties derive from both this choice of time horizon, as well as future scenarios of atmospheric CO_2 concentrations, are not technically driven but rather are a natural consequence of 'arbitrary' policy selections."[16]

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[14] Pedro Moura Costa and Charlie Wilson, An equivalence factor between CO_2 avoided emissions and sequestration – description and applications in forestry, EcoSecurities Ltd,

[15] Reaffirms that global warming potentials used by Parties should be those provided by the Intergovernmental Panel on Climate Change in its Second Assessment Report ("1995 IPCC GWP values") based on the effects of the greenhouse gases over a 100-year time horizon, taking into account the inherent and complicated uncertainties involved in global warming potential estimates. In addition, for information purposes only, Parties may also use another time horizon, as provided in the Second Assessment Report." IPCC, REPORT OsF THE CONFERENCE OF THE PARTIES ON ITS THIRD SESSION, HELD AT KYOTO FROM 1 TO 11 DECEMBER 1997, PART TWO: ACTION TAKEN BY THE CONFERENCE OF THE PARTIES AT ITS THIRD SESSION, 25 March 1998, P. 31, Decision 2/CP.3

[16] APPENDIX 3: 100 YEARS A FICTION?

Flexibility via Regulations

The Bill makes provision for a period other than 100 years to be specified in the regulations. Part 9, Div. 3, clause 133 (f) (i) "a hundred year period or (ii) if, at the time that the methodological determination was made, another period was specified in the regulations, that other period."

Recommendation 1: It is recommended that various periods be included in Regulations pursuant to the Bill's clause 133. These 'other periods' should include 5 years, 10 years, 15 years, 20 years, 25 years, and five year periods up to 55 years.

This will allow for innovative methodologies to emerge.

Additionality

The Kyoto Protocol requires that an offset must represent emissions avoided or sequestered that would not have been avoided or sequestered in the normal course of business as usual. Ie., they are truly additional and therefore make a genuine contribution to Greenhouse Gas abatement. This is a necessary condition for buyer confidence in and therefore demand for the offsets.

At the same time, the Government wants to encourage broad involvement among farmers. But their confidence in the offsets market could be affected by several aspects of the Integrity Standard known as Additionality. The Bill includes several tests for deciding what practices are

Additional. The application of these tests can have what are called 'perverse outcomes'.

For instance, a practice is additional if it is 'not common practice in the relevant industry or the kind of environment in which the project is to be carried out.' (Part 3, Division 6, Clause 41 (3)). If 'common practice' is defined as between 10% and 50% adoption, the ability to qualify for offsets is denied to at least half the farmers. The cut-off point would be arbitary and its enforcement would in all likelihood be perceived as an injustice.

The "Common Practice" test is based on a false premise: that farmers follow each other or the dollar like sheep when adopting new practices. Farming is not a purely economic activity. "Business as usual" cannot be assumed to be whatever will bring the best return. A farmer's "culture" or "ideology of agriculture" will dictate decisions and is often a barrier to shifting practices which the offset is used to overcome. The emotional context of the decision made on a farm is very different to that made in a factory or a forest.

The Bill fails to specify what 'common practice' is. It also fails to define 'relevant industry' and 'kind of environment'. To achieve the Objects of the Legislation, the greatest number of farmers must be involved. Therefore definitions of the terms 'common practice', 'relevant industry' and 'kind of environment' that enable these Objects to be achieved should be chosen.

Recommendation 2: To this end, we recommend that the following definitions be adopted:
'Common practice' – the conventional approach, the default choice, practiced by the vast majority (90%) of growers in a district.
'Relevant industry' - sectors and subsectors which align the business mix with business practice; ie. pasture cropping for perennial pasture improvement in superfine woolgrowing enterprise.
'Kind of environment' – climate zone by geographic region; eg. coastal plains, tablelands, slopes, plains, by tropical, sub-tropical, temperate, arid zone, etc.

Rival interpretations of "Additional"

Rules have been specified to ensure additionality of the project. But, according to the Stockholm Environmental Institute, there are currently two rival interpretations of the additionality criterion:

1. What is often labelled 'environmental additionality' holds that a project is additional if the emissions from the project are lower than the baseline. It generally looks at what would have happened without the project.
2. In the other interpretation, sometimes termed 'project additionality', the project must not have happened without the offset credits.[17]

[17] Anja Kollmuss, Helge Zink and Clifford Polycarp, Making Sense of the Voluntary Carbon Market: A Comparison of Carbon Offset Standards (Stockholm: Stockholm Environment Institute, 2008).

Environmental additionality is sensible, and is becoming the default definition. This definition is the most widely adopted by project proponents and developed countries to assess the additionality of projects.[18] According to the World Business Council on Sustainable Development, '… it is now very clear that additionality refers to environmental additionality'.[19]

Recommendation 3: Exchange the "Project definition" of Additionality for the "Environmental definition", ie., a project is additional if the emissions from the project are lower than the baseline.

The ultimate perverse outcome

The fundamental Additionality principle directs that the practice that generates the offsets must not be "Business As Usual". Instead it should represent truly additional emissions reductions, ie. they would not have happened without the offsets. This sounds reasonable, but it has a perverse outcome: this Additionality principle rewards the least progressive farmers and penalises those farmers

[18] Damilola S. Olawuyi, 'From Kyoto to Copenhagen: Rethinking the Place of Flexible Mechanisms in the Kyoto Protocol's post 2012 Commitment Period', 6/1 *Law, Environment and Development Journal* (2010), p. 21, available at http://www.lead-journal.org/content/10021.pdf

[19] Submission by the IETA, 11.7.02, cited in Ben Pearson and Yin Shao Loong, 'The CDM: Reducing Greenhouse Gas Emissions or Relabelling Business As Usual?', available at http://www.twnside.org.sg/title/cdm.doc.

who adopted conservation farming when it was frowned upon.

Farmers who changed their soil management practices as a result of being involved in programs staged by government agencies auch as Catchment Management Authorities, Departments of Primary Industries, etc. will now be banned from access to the revenue streams flowing from the biggest commodity market in history. The number of farmers affected by this "Additionality Dilemma" would be in the thousands, and they would be predominantly Landcare farmers, the best farmers in their districts. They would include farmers who invented many of the techniques used to store carbon in soil.

Risk of Reversal/No Buffer

There is another reason why "Project Additionality" is inappropriate for assessing additionality for soil carbon offsets: ease of reversability. The assumption that, once a manufacturing enterprise has re-engineered its processes or a landholder has planted a forest, that there is little chance they will reverse the decision, given the investment involved. But the same cannot be said for a farmer. The plough, herbicide and superphosphate are still at hand. Making the change is not the key decision. It is persisting when the going gets tough that makes the difference. Whether it be business as usual or truly additional, every hectare that is not under contract is at risk of not contributing to the global response to Climate Change which is now dependent on maximising the

sequestration capacity of farmlands to draw down enough CO2 to slow Global Warming while the world community makes the shift to a low carbon economy.

"Specificity" of soil carbon

Soil carbon sequestration has a claim for special consideration. The following list of unique characteristics has been summarised under the heading of the "Specificity of Agriculture" which means its unique multifunctionality. The provision of food and fibre, the notion of food security, the national security implications of domestic supply capability, the export earnings of agricultural commodities, the income generated for rural communities, the increasing value of environmental services, including carbon sequestration, the socio-cultural contribution of rural community values to national identity, etc. are all dimensions that make Agriculture subject to 'specificity'. No other industry is described this way.[20]

As the carbon cycle is dynamic and matrixed, so also is agriculture. The simplicity of emissions-only industries or sequestering-only sinks allowed the authors of the UNFCCC "Tools" to set the tram tracks on a single gauge when a portfolio of solutions as always going to bring with it a diversity of needs for methodologies.

The Reason given for persisting with a clearly out-moded and unworkable system is that Marketplace reality dictates our limited freedom for movement: "The

[20] Maier, Leo, Shobayashi, Mikitaro, "Multifunctionality: Towards an analytical framework", OECD , 2000

environmental integrity of the scheme will directly affect consumer confidence and the amount that buyers are willing to pay for Carbon Farming Initiative credits. For these reasons it is important to ensure that all abatement credited under the Carbon Farming Initiative meets internationally recognised standards which are designed to ensure that abatement is real and verifiable." (Section 7, Carbon Farming Initiative Consultancy Paper.)

Here at home, the Department's own Voluntary Market Standard limits the degree of flexibility: "Under the NCOS, only offset credits that meet these standards are recognised as suitable for the purpose of carbon neutrality." (In Section 5. of the consultation document the following link was made between the CFI and NCOS credits: "All CFI credits would be recognised as eligible under the NCOS for use by Australian businesses seeking to voluntarily offset their emissions or become carbon neutral.")

Arguments against flexibility with regard to soil carbon are based on false premises*:*

1. *Consumers and buyers will not have confidence in soil carbon offsets if they are not strictly manufactured and measured by the methodology devised for factories and forests*. This assumes that buyers understand the principle of Additionality, which few people in the business world do. It also assumes that buyers cannot be educated to buy multiple benefits from farm based offsets, given the "win-win-win" of soil carbon offsets.
2. *There is a need to comply with international standards or there will be no international sales*.

The international market does not exist and if it did, the concern indicates that DCCEE believe it will be a buyers' market. It will be a buyers' market if the producers act in the way they do with other commodities – competing against each other in a race to the bottom on price. A global problem needs a global solution. Farmers, through the International Federation of Agricultural Producers (6m members), could adopt the strategies of the fossil fuel industries and control supply to support prices. The world is coming to understand the James Hansen/Rattan Lal/Michael Battaglia belief that only Agriculture can buy us the time we need to avoid 2°C increase.

Recommendation 4: It is recommended that there be added to the two non-Kyoto offset mechanisms a third that is truly non-Kyoto and removes the artificial barriers mentioned above to allow trading in soil carbon offsets in the short term.

Recommendation 5: It is recommended that, in the longer term, Australia's campaign to have Article 3.4 changed to remove liability for non-anthropogenic emissions from soils (drought or bushfire) be expanded into an initiative to reform the Kyoto Protocol as it is applied to Agriculture. The Protocol, which becomes inoperative at the end of the current compliance period (2012), currently does not reflect biological reality.

Peer-reviewed science

The insistence that methods 'be supported by relevant scientific results published in peer-reviewed literature' is a logical, commonsense measure at first glance. However, like other Integrity Standards, the Peer-Reviewed Literature provision has the potential to create perverse outcomes.

There are four reasons why relying on peer-reviewed science could defeat the purpose of this Legislation:

1. Australia has very little of the type of hard data needed to populate models to be used by scientists to estimate soil carbon levels. The Soil Carbon Research Program will not deliver a universal measurement tool to enable the trading in soil carbon offsets to begin anytime in the next 5 years. The current tranche of projects will provide modelling data for only 20% of land management practices and climate zones that need to be assessed.[21] The Minister, Greg Combet, informed us recently that there is no funding available for the 80% balance of the work.[22] Were even the money available, it could take up to 10 years to provide a comprehensive, data-rich model.
2. There is a widespread belief among scientists that Science has proved that Australian soils have little potential to sequester Carbon. In fact, no scientific studies have tested the potential of Australian soils

[21] Dr Jeff Baldock, director of the Soil Carbon Research Program, pers. comm.
[22] Minister Greg Combet, CFI Briefing Session, organised by the Hon. Rob Oakshot, Parliament House, 17 March, 2011.

to sequester carbon where 'potential' means the maximum possible under ideal conditions[23]. The research program on which the National Carbon Accounting System (NCAS) was based suffered from gaps in the data. The paired sites chosen for analysis were unrepresentative of the land management techniques that are widespread today. The case studies reviewed in another major report are out of date. The data sets are incomplete, focusing almost exclusively on conventional rather than regenerative land management techniques. It studied only soils managed in ways that caused losses of carbon rather than soils managed in ways that capture and store carbon (ie. regenerative land management techniques such as biological farming, time controlled grazing management, pasture cropping, etc.)[24] Despite the lack of official data, there are many indications that Australian soils can sequester significant amounts of carbon.[25] Leading Carbon farmers report 2.5%-3% increases in total carbon over 10 years – an annual increase of 0.25%/yr. or 27.5tCO2/yr. At $8/tonne CO2, (Bulk density 1.0; 30cms core.) they could earn $220/ha/yr. The highest increased conceded by conventional science is 6tCO2/ha/yr.[26]

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[23] The peer review methodology disqualifies options for evaluation of "potential" until they have passed through the research-report-review-publish process.

[24] See Appendix 4. Gaps in the Data.

[25] Senior CSIRO soil scientist Jeff Baldock says there is today no technical barriers to a fully-functioning market in soil carbon, and that such a market could make it 'more economic to farm for carbon than to farm for yield.' (ABC Rural Radio, October 2007, Orange Field Days.)

[26] Dr Peter Grace, Estimated annual CO_2 change (0-30 cm) in response to improved management in Eastern Australian soils (based on a 20 year timeframe) using the SOCRATES approach, unpublished.

3. Science has been unable to date to verify the results that Carbon Farmers on 3 continents have achieved, despite multiple attempts. The phenomenon – dubbed the "Norton Syndrome" after the scientist who identified it – has been explained by methodology problems[27] and possibly by experimental bias.
4. Personal attitudes to carbon trading can compromise the objectivity of science. For instance, in September 2010, in its official publication ECOS, the CSIRO reported, "There's a virtual consensus among soil scientists that Australian farmers shouldn't need any extra incentives to increase their levels of soil carbon." This expression of belief should disqualify these scientists from contributing to the research, having compromised their objectivity. The willingness of CSIRO scientists working in the soil carbon field to express violent opposition to offsets trading undermines confidence in official Science. The following demonstrates the extremes some scientists will go to: *"... market-based C-trading schemes involving pastures, [will be] exposed to the risks of complicated, ill-conceived, ill-understood, poorly regulated financial instruments and arrangements that are replete with opportunity for fraudulent scams and inappropriate diversion of community wealth to the personal fortunes of scheme managers and traders, while not delivering the scheme objectives, reminiscent of those involved in the Global Financial Crisis of 2007-2009."*[28]

   Dr Clive Splash, CSIRO environmental economist, felt qualified to give advice on ethics: *"There is the potential for emissions trading to have undesirable ethical and*

[27] See Appendix 5: Norton's Syndrome: Carbon Farming and the Failure of Peer-Review in Agricultural Science

[28] Roger M. Gifford, CSIRO Plant Industry, Carbon sequestration in Australian Grasslands: Policy and Technical Issues, Proceedings of FAO workshop on 'The role of grassland carbon sequestration in the mitigation of climate change', Rome, 15-17 April 2009

psychological impacts and to crowd out voluntary actions."[29]

These 4 elements explain the delay in finding solutions to the challenges facing soil carbon.

Recommendation 6: Appointing peer—review published data as the gatekeeper will defeat the intention of the Bill. Other risk management devices are required.

Relinquishment Catch All Provision

Carbon Farmers of Australia questions the need for Part 7, Section 90: "Requirement to relinquish – reversal of sequestration other than due to natural disturbance or conduct etc." This provision creates a non-specific liability for farmers which is an unacceptable risk, given that all other potential reversal scenarios are covered. The risk of reversal buffer covers losses through natural causes (bushfire, drought) or vandalism. Failure to mitigate losses by the proponent is covered by Section 91.

Section 90 implies that there can be some other cause of reversal that is beyond the control of the project proponent and is not caused by the project proponent, yet the proponent is to be compelled to relinquish ACCUs.

[29] Clive L. Splash, The Brave New World of Carbon Trading, Munich Personal RePEc Archive, December 2009

Recommendation 7: Unless it can be demonstrated there is a substantial reason for this Section (ie., that it is not merely a speculative catch-all for unanticipated occurrences), we recommend that it be deleted.

Waiting for better science?

The world does not have the luxury of time to be cautious and conservative, as soil scientist and DOIC member Professor Annette Cowie told the Victorian Parliamentary Committee Inquiry Into Soil Carbon Sequestration: "I think the issue of climate change is so urgent that it would be a mistake to say we have to put this off to wait for better science. I do not think we need perfect science and perfect understanding to be able to start providing incentives for landholders to build soil carbon." Professor Cowie is Director, National Centre for Rural Greenhouse Gas Research, University of New England. She is also a member of the Domestic Offset Integrity Committee. She was echoing the words of former chief of atmospheric research at CSIRO Graeme Pearman, "If we are waiting for perfect knowledge and perfect solutions, it will be too late." There is no time for new 3 year research projects. Three years is too long to wait. The time has come for learning by doing. Take action and monitor results. Assume we are wrong and look for evidence of it. The risk of not doing something is now greater than the risk of doing the wrong thing. The Precautionary Principle should be invoked: "where there are threats of serious or irreversible damage, lack of

full scientific certainty should not be used as a reason for postponing such measures".30

APPENDIX 1: Rattan Lal

Rattan Lal is a Professor of Soil Science in the School of Environment and Natural Resources. He is the Director of the Carbon Management and Sequestration Center at Ohio State's Ohio Agricultural Research and Development Center.

Professor Lal conducts research in carbon sequestration in terrestrial ecosystems, soil dynamics and processes, and natural resources management with emphasis on food security and environmental quality in the United States, Africa, Latin America, and India. Currently his research is focused on carbon dynamics in relation to soil erosion, and soil quality as indicated by soil structure and productivity.

Professor Lal is the recipient of prestigious Norman E. Borlaug Award (2005) and the von Liebig Award (2006) for his contributions and research in sustainable management of soil and natural resources. His service to professional organizations

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30 'The "precautionary principle" responds to the dilemma that, although many uncertainties still surround climate change, *waiting for full scientific certainty before taking action will almost certainly be too late to avert its worst impacts*. The Convention, following many environmental treaties before it, thus calls for "precautionary measures" to combat climate change, stating that, "where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures".' A GUIDE TO THE CLIMATE CHANGE CONVENTION AND ITS KYOTO PROTOCOL, UNFCCC, Bonn,

includes Editor-in-Chief of the Encyclopedia of Soil Science, Co-Editor-in-Chief of Soil & Tillage Research, and Past-President of the Soil Science Society of America. He is a fellow of the Soil Science Society of American, the American Society of Agronomy, the Third World Academy of Sciences and the American Association for Advancement of Science. He is a member of the U.S. National Committee of Soil Science, and was a lead author on the Intergovernmental Panel on Climate Change and the U.N. Millennium Assessment.

He has authored, reviewed and edited 1,200 journal articles and publications during his career, and has published in a variety of journals including *Science* and *Soil & Tillage Research*. He has presented numerous keynote seminars around the world, including the prestigious Presidential Lecture chaired by the President of Iceland.

APPENDIX 2: Co-benefits of Soil Carbon Sequestration

The following list of co-benefits of conservation farming appears in a consensus report from a 2008 international gathering of scientists, policy advisers and farmers, organised by the UN FAO:

FINANCIAL BENEFITS FOR FARMERS

Greater yields and improved yield stability in variable weather
Reduced fuel and labor requirements
Greater resilience to drought through better water infiltration and retention
Alleviation of labor demand at key times in the year, permitting diversification into new on-farm and off-farm enterprises
Better cycling of nutrients and avoiding nutrient losses
Higher profit margin with greater input-use efficiency
Increasing land value due to progressive improvements in environmental quality

BENEFITS TO COMMUNITIES & SOCIETY

More reliable and cleaner water supplies resulting in lower treatment costs
Less flooding due to better water retention and slower runoff, resulting in less damage to roads, canals, ports and bridges
Improved air quality with less wind erosion
More secre food and water sources
Economic and industrial development opportunities
Improved quality of life

ENVIRONMENTAL BENEFITS

Favorable hydrologic balance and flows in rivers to withstand extreme weather events
Reduced incidence and intensity of desertification
Increased soil biodiversity

Less soil erosion resulting in less sediment in rivers and dams
Potential for reduced emissions of other greenhouse gases, including methane and nitrous oxide, if compaction is avoided
Reduced deforestation due to land intensification and more reliable and higher crop yield
Less water pollution from pesticides and applied fertilizer nutrients
Less hypoxia of coastal ecosystems

Source: This summary document was derived from the Conservation Agriculture Carbon Offset Consultation, attended by approximately 80 scientists and stakeholders, including Carbon Farmers of Australia, on 28-30 October 2008, at the Beck Agricultural Center in West Lafayette, Indiana, USA. The Consultation was sponsored by the United Nations Food and Agriculture Organization (FAO) and the Conservation Technology Information Center (CTIC), with technical support from United Nations Framework Convention on Climate Change (UNFCCC) staff.

APPENDIX 3: 100 YEARS A FICTION?

Pedro Moura Costa and Charlie Wilson, An equivalence factor between CO_2 avoided emissions and sequestration – description and applications in forestry, EcoSecurities Ltd

"In operationalising the Absolute Global Warming Potential concept, the Kyoto Protocol sets 100 years as the reference time frame over which cumulative radiative forcing is to be measured. Over this 100-year period, the decay curve integral is equivalent to the forcing effect of approximately 55 tonne.years of CO_2. Hence, we can infer that removing 1 t CO_2 from the atmosphere and storing it for 55 years counteracts the radiative forcing effect, integrated over a 100-year time horizon, of a 1 t CO_2 pulse emission. Under the terms of the Kyoto Protocol, the $AGWP_{100}$ of CO_2 represents the radiative effect of a pulse emission which any sequestration-based activity is designed to counteract (or indeed, any emission reduction activity is designed to avoid or delay). In effect therefore, as understood by the Protocol, carbon sequestered at t=0 and stored until t=55 is directly equivalent to an avoided emission at t=0 and could be credited accordingly. Any new emission from the subsequent release of the stored carbon at t=55 would not be deemed to have caused any *additional* radiative forcing effects to those which characterized the start point of the project, measured over the 100-year reference period from the point of emission/sequestration. This timeframe of equivalence between sequestered and emitted CO_2 is here called the '*Equivalence Time'* (*Te*). The re-emission of sequestered carbon after its storage for t=*Te* does not affect this equivalence.

APPENDIX 4: Gaps in the Data

Farming has changed in the 20 years since most of the studies reviewed for National Carbon Accounting System were done. For this reason it was not possible to have a representative range of samples. There are gaps in the data sets. The authors of these reports warned against relying on them for definitive conclusions

The consultant hired to assess the data sources was also concerned:31 "There are also considerable deficiencies in the completeness of the data… In many established agricultural areas, there are practical difficulties in finding true pairs… The approach is limited by gross lack of data…"

The Australian Greenhouse Office admitted that the data was insufficient. "Development of the NCAS was undertaken with the clear understanding that data would be imperfect, but that the significance of data limitations could be assessed only in a functional integrated system." 32

The AGO took a 'fix it in the mix' approach: "The tacit acceptance of variability in data provides for a proper focus on matters of accuracy and bias, rather than on potentially unachievable precision." The Agency believed the sheer weight of data points would carry the day, provided there was no bias in the inputs: "Over a large sample … a national inventory derived from an

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[31] *Estimation of Changes in Soil Carbon due to Changed Land Use National Carbon Accounting System - Technical Report No. 2 November 1999*

[32] *"Methods for Estimating Land Use Change Emissions ", Factsheet, National Carbon Accounting System, Australian Greenhouse Office, August 2002*

aggregation of fine-scale events can provide a robust central estimate provided inputs are not biased." But the inputs were biased.

Most official studies recorded poor carbon performance because they studied only traditional techniques which are destructive of soil carbon.

They did not find sequestration because they weren't looking for it. They were looking for declining carbon. They found it. There are several trials underway to fill the gaps, further evidence that the gaps existed and the conclusions were unsustainable.

APPENDIX 5: Norton's Syndrome: Carbon Farming and the Failure of Peer-Review in Agricultural Science

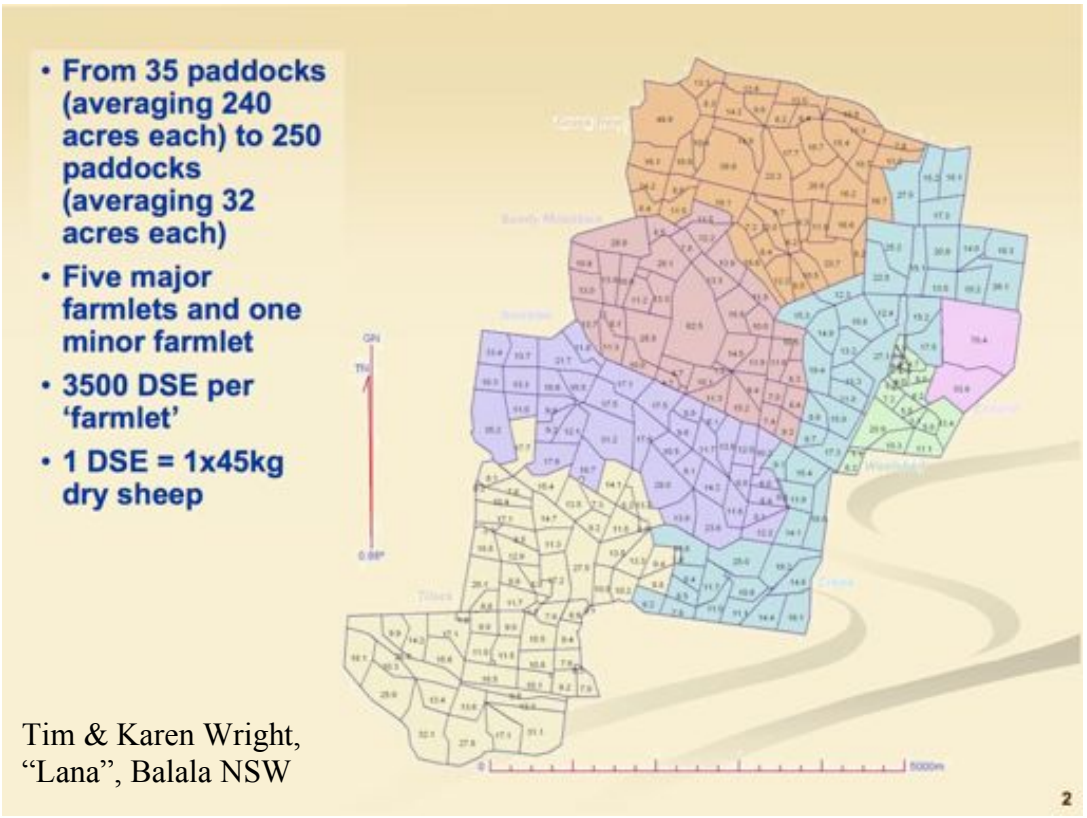
Grazing Management is a form of Carbon Farming that has gained popularity on three continents over 30 years. Practitioners regularly report increases in vegetation and carrying capacity. But science has yet to verify their results. This gap between farm and scientific reality was first identified by Professor Ben Norton of Curtin University, WA. He declared that the gap between science and farmers was widening, in the McClymont Lecture[33] in 1998: "The results of grazing trials have been counter-intuitive... Based on scientific research, [we] can only recommend continuous grazing and reduced stocking rates..." [to increase pasture biomass]. Science, based on 'hundreds of studies' concluded that planned grazing is not cost effective. "Hundreds of graziers on three continents claim that their livestock production has increased by half or doubled or even tripled following the implementation of rotational grazing," he says. Yet the majority of published research studies of rotational grazing find that continuous grazing is better than or comparable to rotational grazing in terms of either animal or plant production.

The reason lies in the methodology adopted by the scientists: the research trials often employed only 16 paddocks or fewer in the rotation.[34] A typical real-life rotational cell will have up to 50 paddocks, the high numbers affecting the amount of time animals are intensively grazing each paddock and the amount of time the paddocks have to recover.

A live example of this occurred in 2003 when a team set out to test the claims of Holistic Management and Grazing For Profit's rotational grazing management systems that they produce more

[33] Norton, BE., "The application of grazing management to increase sustainable livestock production," Animal Production In Australia, Vol. 22 1998.
[34] *Ben Norton, "Production-Oriented Conservative-Impact Grazing Management", WA Department of Agriculture workshop, 2002*

vegetation than conventional grazing. Practitioners of these grazing techniques report that it can take approximately 7 years for the full impact of grazing management to become noticeable



with any dramatic results. Anything less that 35-55 paddocks defeats the purpose because rest (or freedom from grazing) is the key management variable in vegetation growth. Animal impact - bunching them up so that they graze the paddock evenly, disturb the topsoil and fertilise it with their dung and urine - is a key part of the system, which is why such a time controlled grazier would graze 25-50 sheep per hectare for the period of grazing, which is in many case less than a week or two weeks.

The scientific study divided 10 hectares into 15 plots in which to study 5 grazing systems over 4 years. Naturally the researchers concluded that there was no effect on herbiage mass from rotational grazing. Therefore, they concluded 'recipes' (exotic grazing management systems) don't work. This study's findings were unreliable.[35]

[35] *Lodge, G.M., Murphy, S.R., and Harden, S., "Effects of grazing and management on herbiage mass, persistence, animalproduction and soil water content of nsative*

In his new book, Meat: A Benign Extravagance, Simon Fairlie uncovered two cases of Norton's Syndrome, one including a confession of defective methodology. A paper by *Briske, et al, 2008. Rotational grazing on rangelands: Reconciliation of perception and experimental evidence. Rangeland Ecology and Management 61: 3 – 17*, analysed 28 different studies and came to the conclusion that 'these experimental results conclusively demonstrate that rotational grazing is not superior to continuous grazing across numerous rangeland ecosystems.' "Briske did, however, suggest some reasons for the wide gulf between the perceptions of ranchers who used rotational grazing methods, and the findings of scientists. He acknowledges that in experiments, 'grazing treatments are often applied on a more rigid schedule to ensure experimental integrity and repeatability compared to commercial systems that are adaptively managed.' Briske provides a diagram with a grid showing equal periods of grazing time allocated to paddocks throughout both wet and dry periods in the grazing season, from which he concludes that rotational grazing cannot adapt to seasonal fluctuations in grass growth — but the diagram more likely demonstrates that scientific experiments cannot adapt to them. Voisin is adamant that the time spent in paddocks must be varied according to the rate of grass growth, and emphasises in bold letters that: 'Flexibility in management is essential . . . It is not a case of rigidly obeying figures: one must follow the grass . . . Figures are only guides: in the end it is the eye of the grazier that decides.' One wonders how many of these scientific experiments have been managed by someone with the eye of a grazier."

Dr YN Chan (in the global Top 10 for references to his papers) reveals little is known to the peer-reviewed world about grazing management and perennial grass species. "[T]here are … pasture management practices that are likely to affect SOC, namely grazing management and use of other pasture species. Regarding the latter, there is a recent move to increase the

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pastures", Australian Journal of Experimental Science, 2003, 43, 891-905

proportion of perennial pastures with deeper root systems in the landscape for the control of dryland salinity. However, the effects of these management practices on SOC sequestration are not known…"

The same problem of methodology led conventional science to vastly under-rate organic agriculture, according to Dr Charles Benbrook, Chief Scientist of the Organic Centre: "Much of the past research comparing 'organic' and conventional systems has been flawed. One of the reasons that many studies done by academic scientists have failed to find consistent differences between conventional and organic food is because the scientists have based their field research on university experiment stations that have been farmed conventionally for twenty, thirty, or a hundred years. They attempt to convert some acreage to organic production, but typically do it quickly, accepting certain "compromises." They are simply not able to grow crops as skillfully as an experienced organic farmer. They don't have the time to build up their personal farming skills to match those of good organic farmers. They lack the time to work with a piece of land for five, ten, or twenty years in building up its fertility and capturing all of the biological benefits that are associated with organic farming."[36]

More recently, the Australian Council of Deans of Agriculture launched an attack on the makers of biological fertilizers, claiming "some" of them "could" be endangering Australia's export trade by introducing contaminants into the food chain. President of the Council, Peter Roush, abandons the need for evidence – "we don't know what's going into those products" – before drawing a conclusion – ""It's doubtful that there's any

[36] The Science of Organics: Peeling the Onion to Reach Core Truths
http://www.organic-center.org/res.lead.benbrook.html

efficacy for [them]".[37] A brave biofert maker would submit to these scientists.

The biofertiliser industry is not afraid of scrutiny; but it is aware of Norton's Syndrome. Angus Johnston, National Projects Manager, Compost Australia says, "The development of standards relies pretty heavily on outcomes from scientific experimentation and the resulting peer reviewed papers and reports. The so called 'objective evidence'. The problems with the scientific method arises from decisions made about experimental assumpt-ions and boundary conditions that depend on your initial point of view. We should all recognise that no scientist is truly objective nor are they impervious to external influences. For example, it is very easy to show that a synthetic fertiliser works 'better' than a composted soil conditioner if you choose the right evaluation criteria, time frame and application scenario. You can also design an experiments to make the soil conditioner look better. Which experimental result is right? Who made the experimental assumptions?" he asks. He suggests a proactive approach: "We must accept that the real challenge we have is reconciling our different ways of looking at the world (creating a common narrative) so that our products can eventually achieve credibility through independent recognition. Meeting such a challenge requires communicating, building networks and building relationships over time."

Farmer/biofertiliser supplier Jeremy Bradley was Norton-ed when subjecting his products to strict scientific testing: "One participant in our trial of compost tea has just pulled of a record crop of garlic with a notable reduction of reject bulbs where there was little statistically significant (proper use of the word) between the control and treated rows. There was however visibly better soil structure with earlier commencement of machine harvest after rain and more breakdown of organic residues in the treated rows."

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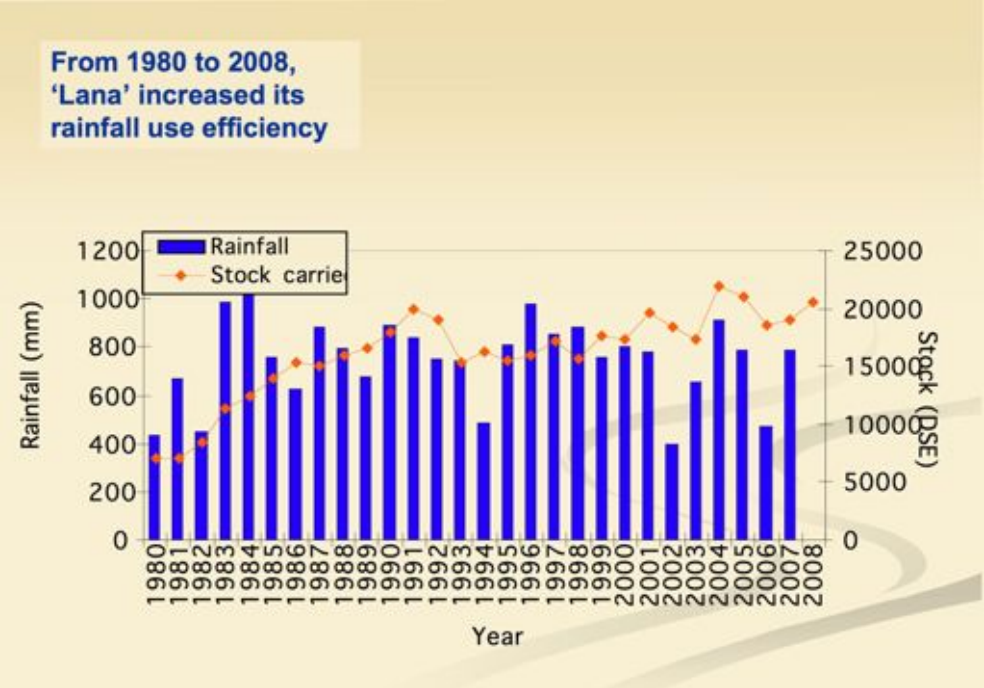
37 *"Academics lash out at 'wild west' farm products" The Country Hour, ABC Radio, ABC Online, 24/11/2010*

On his own property Jeremy experienced an increase in pasture quality, type and mass. After the 18 month trial the treated areas could run twice the stock that he could put on the untreated areas. "Our rigorous scientific method has failed to find much difference at this stage but as farmers we are convinced that our soils are improving in depth, structure and fertility. Also, we know that we have improved productivity."

Science has serious issues to face if it is to regain its former status as the gatekeeper of knowledge among farmers.



Tim & Karen Wright, "Lana", Balala NSW – conventional science cannot explain what happened in 1994, 2002 and 2006.

Submission 016
Date received: 12/04/2011

Carbon Farming & Trading Association

The Carbon Farming & Trading Association has emerged out of the Carbon Coalition Against Global Warming,ss a farmers' and citizens' group, formed in 2006 to work towards the day when soil carbon offsets are traded in Australia and farmers paid fairly for what they grow. Soil Carbon Trading is the fastest way to reverse farm landscape degradation on the widest scale, maximizing Climate Change mitigation and rural economy restoration. The Coalition has been recognised as a world leader in representing farmers' interests in and educating farmers about carbon farming issues (see below). It has been acknowledged by the CSIRO's senior soil carbon scientist Dr Jeff Baldock for playing a role in securing the A$20m funding for Australia's Soil Carbon Research Program two years ago which has recently been augmented with additional funding under the Government's $46m Carbon Farming Initiative. The Coalition has a particular focus on the two-way relationship between science and on-farm practice and advocates the benefits of genuine collaboration for better scientific outcomes. It has published a white paper on the subject. The Coalition's education arm, Carbon Farmers of Australia, has staged annual conferences in Australia since 2007 at which leading scientists and 'alpha' farmers share the results of their observations. CFA also conducts Farm Ready approved workshops to prepare landholders for trade. This includes training in the use of the Soil Carbon Optimising Farm Planner and the Soil Carbon Risk/Return Calculator. It published the world's first Carbon Farming Handbook in 2008. Its blog - started in 2006 - has more than 700 entries. Our work was seen as worthy of inclusion under the United Nations International Year of Planet Earth. In 2011 it will launch the Carbon Farming & Trading Association, Carbon Farmer Magazine, and Carbon Farming News, a newsletter.

Carbon Farming
& Trading Association

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• “Yours is a noble cause.” Professor Rattan Lal, America’s most senior soil carbon scientist.
• "The Carbon Coalition should be awarded the Nobel Prize." - Andre Leu, Chairman, Organic Federation of Australia
• "You single-handedly barnstormed the issue onto the national agenda." - Matt Cawood, The Land Newspaper
• *“I applaud all your efforts in raising public and farmer interest in soil carbon. Regardless of whether soil carbon is ever traded at an economically meaningful level, greater awareness of the sustainability and productivity benefits are a great thing. I came here from the US a few years ago where I do not think I have once seen soil carbon discussed in the media and here it is hard to pick up a newspaper without reading an article on soil carbon.” Dr Jon Sanderman , Research Scientist, CSIRO Land & Water*
• “Louisa and Michael should be in the Hall of Fame of Eco-preneurs for Carbon Farming solutions to Cliimate Change.” Martin Royds, Carbon Cocky of the Year 2007.
• “I admire Michael’s tenacity in pursuing the opportunity for landholders to contribute to the Climate Change challenge… The UN is coming around to Michaels worldview….” - Dr Michael Walsh, Senior Vice President, Chicago Climate Exchange
• “Carbon Farmers of Australia has opened the lines of communication between the farmers, scientists, and traders, and cleared up many misunderstandings.” - Dr Brian Murphy, NSW Department of Environment and Climate Change
• " Carbon Farmers of Australia have demonstrated leadership and vision in the field of soil carbon sequestration. Their tireless work is widely recognized in the United States.” - Abe Collins, Co-Founder, Carbon Farmers of America
• “Carbon Farmers of Australia address the root cause of Australia's degraded grasslands.” - Allan Savory, Founder, Holistic Management